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EDITORIAL

Economic and social development is in the focus of interest of every contemporary society: equally in developed countries and also in countries which are still going in that direction. Therefore, it is not unusual that conferences dedicated to economic and social development cause attention of numerous researchers across the world. Since majority of researchers come from academic community, their interest is to publish papers in journals important for their profession and scientific discipline. Organizers of conferences on economic and social development aim to help all collaborators in the development of their scientific projects, and especially in the dissemination of their research results. That was the main reason to start Journal of Economic and Social Development which will primarily publish selected papers from regular and thematic conferences. First number of the journal is comprised of 25% of accepted papers from the second conference in Paris, and selection process, after previous double blind reviews, was carried out by members of the International Editorial Board led with excellence criteria and thematic actuality. Authors of selected papers come from different economic and social environments and have different backgrounds as well as different academic education. That diversity is great foundation for interesting papers. We hope that readers will recognize values promoted by this journal, and that they will support its development.

Marijan Cingula
Editor

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Ayuba A. Aminu¹
Desmond I. Eluwa²

THE IMPACT OF TAX REFORMS ON GOVERNMENT REVENUE GENERATION IN NIGERIA

Abstract

The study examines the impact of Tax Reform Policy on Revenue generation of the Federal Government of Nigeria. The primary objective of this paper is to prepare a case study on tax policy reforms in Nigeria, with the specific objectives of examining the main tax reforms in the country, highlighting tax revenue profile and contributions of the three categories of taxes identified as personal, company and custom duties to the total revenue collection. The techniques of data analysis adopted for the empirical study were the Analysis of Variance Method and the Scheffe's Multiple Comparison techniques. In addition, the 'F' test of the analysis of the variance was used to test the hypothesis of no significant difference in the impact on personal, company and custom duty tax revenues of the Federal Government by each of the following tax reform policy objectives; enhancement of the principles of good tax system, improvement in the tax administrative structure, removal of disincentives to tax compliance and promotion of investment opportunities. From the results, it was concluded that each of the tax reform policy objectives had significant impacts on the personal, company and custom duty tax revenues of the federal government of Nigeria. Scheffe's comparison test confirmed that tax revenues from both company and custom duty exceeded personal income tax. It was recommended that for improved tax revenue generation from pursuit of tax reform policy objectives, the training and employment of qualified tax personnel who will be adequately equipped with appropriate materials is necessary. Furthermore, the adoption of strategies for an effective and efficient tax reform alongside with harmonization of government industrial and stabilization policies with those of tax reforms.

Keywords

Revenue, Tax, Tax instruments and Administration, Tax reform

1. Introduction

Nigeria is a nation with federal political structure that adheres strictly to the same principles of fiscal regime and this system has serious implications on how the tax system is managed. It is characterized by unnecessary complex, distortion and largely inequitable taxation laws that have limited application in the formal sector that dominates the economy. Tax is an essential source of government revenue that defrays the expenditures incurred by government by making it mandatory on tax payers. Tax is a valuable instrument of public finance whose magnitude affects the level of economic activity of an economy and is utilized not only for raising revenue of government to finance its programmes but also regulates the direction of economic performance of the economy. A system of tax vary from one country to the other and because it is a socio/political and economic model representing society's social, political and economic needs and aspiration at any given time, the Nigerian Tax

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System is dynamic and is continually changing to meet the needs of the constituents of the society.

Tax is a system of raising money from individual person or corporate body for the purposes of government developmental programmes. It is rather a compulsory contribution imposed by the government on tax payers in return to identifiable benefit of living in a relatively educated, healthy and safe society. Though tax are imposed to regulate the production of certain goods and services, protection of infant or certain key industries as well as means of curbing inflation and meeting up the operational costs of governance. Taxes in Nigeria are imposed to regulate certain economic activities such as to influence economic activities in the country, bridge the inequality gap between the rich and the poor, to curtail consumption of undesirable goods and services, to correct a country's balance of payment and tax is used to attract investors.

In an attempt to realize these and other tax objectives, government encompasses the different types of taxes such as "Pay As You Earn, (PAYE), Value added tax (VAT), Excise duties etc and this paper is on tax Reform policy Objectives of the Federal Government of Nigeria (FGN) and its Impact on Tax Revenues generated.

Statement of the Problem

Many years after the major tax reforms in Nigeria, there has been mounting criticisms over its inability to realize the objectives towards which it was focused. Serious concern has been expressed over the increasing cost of tax administration of the Federal Government of Nigeria in relation to the tax revenue collections as evidenced scholars. This is an indication of high level of inefficiency in the tax operations of the country, which is contrary to the principles of taxation enunciated by Adam Smith. Besides, in contention is whether the objectives of equity, promotion of a viable industrial climate, the reduced tax rate structure, widening of the tax base have resulted in an increase in the tax revenue and it is designed to realize economic stabilization and development and the prevailing distortions in the tax system have jeopardized some of the purpose of the Nigerian tax reform agenda resulting into acrimony within the system.

Objectives of the Study

The main objective of this paper is to assess the impact of tax reforms on revenue generation of the Federal Government of Nigeria. Specific objectives are to;

- identify the tax reform policy instrument objectives of the federal government of Nigeria.
- evaluate with the use of model characterizing the behavior of tax revenue generated from tax reform instrument objectives for the purpose of determining their viability.
- examine the impact of the reforms of the federal government of Nigeria on tax revenues from direct and indirect taxes.

Hypotheses

Ho1: There is no significant difference in the impact which the pursuit of tax reform policy instrument of enhancement of the principles of a good tax system exert on revenues collected by the federal government of Nigeria.

Ho2: There is no significant difference in the impacts, which the pursuit of tax reform policy instrument of improvement of tax administrative machinery exert on revenues collected from the different forms of taxes [personal, company and custom duty] by the federal government of Nigeria.

Ho3: There is no significant difference in the impacts which the pursuit of tax reform policy instrument on the removal of disincentives to tax payment exert on revenue collected from the different form of taxes [personal, company and custom duty] by the Federal Government of Nigeria.

Ho4: There on significant difference in the impact which the pursuits of tax reform policy instrument of promotion of investment opportunities exert on revenues collected from the different forms of taxes [personal, company and custom duty] by the Federal Government of Nigeria

Ho5: There is no significant different between the impacts which the pursuit of tax reform policy instrument of the Federal Government of Nigeria exert on direct and indirect tax revenues.

Conceptual framework and Review

This section examines the literature on the impact of Tax Reforms policy on Revenue generation of the Federal Government of Nigeria. The federal government had taken far-reaching steps aimed at reforming the nation's tax system before the pre-2002 reform efforts. Among these are: The 1978 Task Force on Tax administration headed by Alhaji Shehu Musa. The major thrusts of the report of the task force are: Introduction of the withholding Tax (WHT) regime, Imposition of 10% special levy on Bank's excess profits and imposition of 21 or 22 percent turnover on building and construction companies. The 1992 Study Group (SG) on Nigeria Tax system and system and administration headed by Professor Emmanuel Edozien, recommended the establishment of Federal Inland Revenue Service (FIRS) as the operational arm of Federal Board Inland Revenue (FBIR) and setting up of Revenue services at the tiers of State and local governments. The 1992 study Group (SG) on Indirect Taxation headed by Dr. Sylvester Ugoh recommended a policy shift from direct taxation to indirect or consumption, now referred to as Value Added Tax (VAT).

The current reform process (improvement or changes) commenced on August 6, 2002, after series of proposals forwarded by individuals, business class, and academia and tax experts to the Federal Ministry of Finance. A Study Group was eventually inaugurated to examine the system and make appropriate recommendations to the government on ways to entrench a better tax policy and improve tax administration in the country. After thorough appraisal of the technical issues evolved in the implementation of its far-reaching recommendations, the Group also suggested a tax environment where tax payer is registered as the "king" and a tax system with a "human face" as a strategic option of achieving the broad policy of its sundry recommendations. The study group submitted its report in July 2003. A private sector driven-group was constituted on January 12, 2004 and was fundamentally based on the issues covered by the study group's report of 2003. The Working Group was mandated in its terms of reference to critically evaluate the recommendations of the study group and propose prioritized set of strategies whose implementation would give effects to reform of the Nigerian tax system, which were grouped into short term, medium term and long term.

Both Groups addressed macro and micro issues in tax policy and administration. Among the macro issues discussed were the drafting of a National Tax Policy, Taxation and Federalism, Tax incentives and Tax administration generally.

Reasons for Tax Reforms in Nigeria

The Study Group (SG) and Working Group (WG) recommendations and subsequent evaluations saw the need for more inputs from stakeholders in the nation's tax system, hence the convening of the 1st National Tax Retreat, tagged "Tax Reform and Democracy" held in Lagos from 22-24 August, 2005. Stakeholders agreed at the end of the retreat that the following reasons were not only expedient but necessary for the Nigerian tax system:

- Efficient and effective tax administration
- Stimulate the non-oil sector of the economy
- To resolve contentious issues in tax administration
- Redistribute wealth and entrench a more equitable tax system
- Capacity building for administrators and tax payers
- Centralization of revenue agency and computerization reduce effective tax rates simplify tax regime.
- Develop a tax policy for Nigeria.

Other reasons for tax reforms objectives include:

- To diminish the distortions in private savings and investment caused by taxation, by improving its transparency and predictability and shifting its incidence towards expenditure rather than income,
- To achieve greater flexibility so that development expenditure can be maintained in the face of fluctuations in oil revenue, by broadening the statutory base for taxation and its effective coverage,
- To consolidate and modernize the tax system in order to provide the basis for strong revenue growth and flexible fiscal management.

The theoretical underpinning of tax reform is found in the theory of optimal taxation. The work of Newbery and Stern (1987) has been described by Thirsk (1997) as perhaps the best illustration of the modern theory of tax reform. The modern theory of tax reform analyses tax reform within the normative framework provided by the theory of optimal taxation. Given a government revenue objective, an optimal tax reform seeks to maximize an explicit social welfare function that balances vertical equity gains against tax-induced losses in the efficiency of resource allocation. Tax reform revolves around a notion of some movement away from a given state of tax structure, administration or both. Theoretical exposition of optimal taxation normally begins with a set of fundamental assumptions. One of these assumptions is that production takes place in firms under competitive conditions; with profits distributed to consumers. The other fundamental assumptions are that there are no externalities, and that the price-taking consumers maximize utility. Yet another assumption that is of importance relates to the tax instrument under consideration. In case it is commodity tax, it is assumed that all goods can be taxed while under income tax, it is assumed that income can be observed perfectly.

During the year (1991), a committee was set up by the Federal Government to review the nation's tax systems and make appropriate recommendations. One vital recommendation of

the committee was the need to introduce value-added tax (VAT). The value-added tax since its inception, has in fact been achieving the objectives of transferring tax incidence to expenditure as most previously untaxed expenditure items have been subject to value-added tax. The tax has also broadened the revenue base of the government as it ranks second to import duties among indirect taxes and it rank third in the scheme of direct and indirect taxes.

Tax Reforms Policy Instruments Objective

- Provision of qualified personnel to handle all tax matters in Federal, State and Local government levels.
- Use of Tax Consultants to collect Revenues from government ministries and agencies
- Provision of adequate equipments assets and machinery
 - Functional Vehicles to enhance movement of tax officials and other personnel from one direction to the other for easy execution of duties
 - Provision of computers, machinery and other equipment
 - * Provision of office accommodation, instead of using rented offices for tax duties.
 - * Training and re-training of tax personnel and/or staff in tax offices, workshops, seminars etc.
 - * Enhancing the use of labour-intensive production techniques
 - Renovation of all lapidated FIRS office building

Some Economic Effects of Taxation

The emphasis on tax as a way of raising revenue later broadened into the use of tax as a macro economic instrument for attainment of economic stabilization goals which according to the view of Peacock and Shaw (1971) include; Attainment of full employment, increase in national output levels, promotion of price stability and achieving a balance in the balance of payment. Begg et al. (1994) and Balami (2006), posit that economy can be regulated with view to increase or decrease the level of aggregate demand or output through the use of tax as a fiscal policy measure. Thus in the national income /output determination model which presents output measure by Gross domestic Product (GDP) as $GDP = C + I + G + (X - M)$ taxation plays a major role. Where: C = Consumption Expenditure, I = Investment Expenditure, G = Government Expenditure, X = Exports, M = Imports, (X-M) = Net export.

While the left hand side of the equation (GDP) is the supply or output side and the right hand side constitute the demand side of the economy with the individual constituents C, I, G (X –M) as component of aggregate demand (AD). The summation of these components is referred to as aggregate demand that is, $AD = C + I + G + (X-M)$.

Tax can, therefore, be used as an instrument of fiscal policy by which is meant government decision to change the level of government revenue (tax), expenditure or both (Danbury and McDougall, 1980) to influence the economy. In this way tax as an element of fiscal policy becomes a demand management tool which fiscal policy is as it is used to control the level of aggregate demand since it affects the consumption expenditure.

2. Methodology

In carrying out this study, the following techniques were adopted in analyzing the data collected. Analysis of Variance: This is used to break down the total variation of a dependent variable into different additive components due to various factor levels of an independent variable (source of variation). 'F' Test: This is used to test significance of the different levels of a factor (independent variable) on a dependent variable (in this study it is the tax collections). The 'F' test was used to conduct test on hypotheses (1) to (4) in this study. Scheffer's Multiple Comparison Methods: This is used to compare contrast in typical analysis of the variance problems intended to show how greater or lesser certain variables are in relation to other. In this study, it will be used to test hypothesis 5. Scheffer' confidence interval: This indicated the range within which the true value of the contrast will lie at a specified probability. It can be used as a mutually complementary approach to hypothesis testing involving test of significance.

3. Results, discussions and findings

For the test based on 'F' distribution statistic like the 'F' ratio in the analysis of variance and Scheffer's test ratio stated that we reject the null hypothesis (H_0) and accept the alternative hypothesis (H_1) if the computed value 'F' of Scheffer's test ratios exceed the critical value of 'F' at the specified level of significance and degree of freedom, otherwise we accept alternative hypothesis. With respect to the confidence interval for the Scheffer's multiple comparison methods for the contrast of mean decision rule is to accept the null hypothesis (H_0) and reject the alternative hypothesis (H_1) if the null hypothesized value of the contrast (i.e. $\psi = 0$) falls within the confidence limit.

In hypothesis (1), the computed 'F' statistic for testing the significance of the impact, which the policy variables of tax reforms such as efficient tax system and equitable tax structure exert on revenues of the Federal Government of Nigeria, indicated 8.2549 and 8.0579 respectively. Both computed 'F' statistic exceed the critical value of 'F' at 0.05 level of significance using 2 and 97 degree of freedom for V1 and V2 respectively i.e. 3.957, we reject the null hypotheses and accept the alternative hypothesis. The decision is that the impact, which the tax reform policy instruments of enhancement of the principles of a good tax system exert on government revenues under personal, company and customs duty taxes, is significantly different.

Hypothesis (2), the computed 'F' statistic for the testing the significance of the impact which the policy variables of tax reforms such as removal of distortions, expansion of revenue base and ensuring sufficient flexibility exert on revenues of the Federal Government of Nigeria produced 8.0284, 4.3153 and 535.55 respectively. Since all the computed 'F' statistic each exceeded the critical value of 'F' at 0.05 level of significance using 2 and 97 degree of freedom for V1 and V2 respectively i.e. 3.957. We reject the null hypothesis and accept the alternative hypothesis. Thus, the decision is that the impact, which the tax reform policy instruments of improvement of tax administrative machinery exert on government revenues under personal, company and customs duty taxes, is significantly different. While the computed 'F' statistic for testing the significance of the impact, which the policy variables of

tax reforms such as entrenchment of reduced tax rate regime and tax payment compliance exert on revenues of the Federal Government of Nigeria, produced 6.8413 and 4.5247 respectively. Both computed 'F' statistic exceeded the critical value of 'F' at 0.05 level of significance using 2 and 97 degree of freedom for V1 and V2 respectively i.e 3.957, we reject the null hypothesis and accept the alternative hypothesis. Consequently, the decision is that the impact, which the tax reform policy instruments of removal of disincentives to tax payment exert on government revenues under personal, company and customs duty taxes, is significantly different.

The computed 'F' statistic for testing significance of the impact which the policy variables of tax reforms such as fair allocation of savings to investments, attraction of foreign capital and prevention of capital flight exert on revenues of the Federal Government of Nigeria produced 18.9116, 21.3620 and 17.4158 respectively. Hence the computed 'F' statistic each exceeded the critical value of 'F' at 0.05 level of significance using 2 and 97 degree of freedom for V1 and V2 respectively i.e. 3.957. As a result, we reject the null hypothesis and accept the alternative hypothesis. The decision therefore, is that the impact which the tax reform policy instruments of promotion of investment opportunities exert on government revenues under personal, company and customs duty taxes differs significantly. In hypothesis (5), all the computed Scheffee's test ratio for testing the significance of the contrast of mean involving the impact of tax reforms on revenues from both personal and company taxes when compared with customs duty revenues of the Federal Government on each of the policy variables of tax reforms analysis N0 (6) to No. (15) in table 2.1 (Data or Table summary) exceeded the critical value of 'F' (1-0.05); df: 2,97 which is 3.957. Thus, the decision is that there is a significant difference between the mean impact tax reforms on both revenues from personal and company taxes and those of customs duty. This decision is also the same when the confidence interval of Scheffee's multiple comparisons is used as a complementary approach to hypothesis testing. The reason is that in each of the intervals constructed as shown in the results the null hypothesized value of the contrast (ψ) i.e 0 outside each confidence interval. The result states that direct and indirect tax revenue collections are similar in the pursuit of tax reform policy instruments of the Federal Government of Nigeria?

Source of Variation	Sum of squares (SS)	Degrees of Freedom (DF)	Mean Square (MS) MS=SS/DF	'F' Ratio (MSB/MSW)
Between the means	6,174.27	2	3,087.14	6.53
Within the means	12,768.62	27	472.91	
Total	18,942.89	29		

Table 1: Analysis of Variance (ANOVA)

The result is reject H_0 if computed 'F' test > critical value of 'F' otherwise accept. The computed 'F' test statistic (=6.53) exceeded the critical value of 'F' (0.05, df 2,27) (ie. 3.35), therefore, we reject the null hypothesis (H_0) and accept the alternative hypothesis (H_1) that the mean revenue collections of the taxes as affected by the tax policy reform are significantly different thus the judgment of the officials are correct.

Findings from the data analysis unveiled important facts embedded in the research data. It was discovered that the pursuit of each tax reform policy objective had significantly different impacts on tax revenue generations of the federal government of Nigeria on personal, company and customs duties. The realization that each categories of tax such as personal, company and customs duties, as target of the tax reform policy objective, earned different levels of tax revenue was confirmed from the various hypotheses tested. This gave the indication that the different administration structures as established under the tax code through which assessment and collection machineries for tax are made possible have different capabilities. Also, explaining the difference in the revenue generation abilities in the different categories of tax is the income and expenditure patterns upon which tax liabilities are based. These patterns are mostly influenced by the macroeconomic environment prevalent in the economy. Thus, in period contraction (expansionary) stabilization policy decisions aggregate spending in the economy are reduced (increased) and this accordingly affect indirect taxes such as customs duties. It was additionally discovered that the mean tax revenue generation from both company and customs duties were higher than personal income tax revenue collections, and are therefore recommended as confirmed from analysis using scheffe's comparison methods.

4. Conclusion

This study examined the relationship between tax reforms and revenue generation of the Federal government. It goes further to examine whether tax reforms on various taxes-petroleum profit tax, companies income tax, personal income tax, value added tax, education tax and customs and excise duties and others affect the revenues generated by the federal government. It became obvious from the findings that the pursuit of tax reform policy objectives concerning enhancement of a good tax system, improvement in general tax administrative machinery, removal of disincentives to tax compliance and promotion of investment opportunities increase tax revenues. Besides, it revealed that tax reform policy objectives exert significantly different impacts on tax revenues from the various taxes sources but there are still set backs militating against increased receipts of tax revenues to Nigerian Government among these are:

- Lack of necessary communication technology equipment in the area of information processing, storage and retrieval of data, which would facilitate tax administration in the country.
- Government's inability to provide such working tools have made the work of processing huge volumes of data by manual effort cumbersome and often resulting in tremendous work accumulation.
- The gross inadequacy of well trained staff in tax matters have also contributed to the problem of short falls in revenue projections of the federal government of Nigeria.
- The shortages in both manpower and equipment needs have resulted in the imbalance in capabilities of the different administrative structures for tax assessment and collection machineries.
- Additionally, the inconsistencies in government policies affect tax revenue collections. For instance, while tax policies may be favourable for investments, industrial and other stabilization policy measures may not.

- Tax reforms are not regularly assessed to determine this level of success, ascertain strengths and weaknesses in tax organization and examine the environment in order to articulate better reform strategies.

5. Recommendations

The Federal Government of Nigeria needs improved tax revenue collections in order to satisfy its needs, provide social tax receipts from personal, company, petroleum and custom duty taxes should incorporate the following:

- Enhancement of principles of a good tax system as identified by Adam Smith and confirmed by this study.
- Improvement in the administrative machinery of taxes through removal of distortions and expansion of the tax base.
- Removal of disincentives to tax compliance by lowering the rate regime.
- Promotion of investment opportunities by ensuring corrupt-free and efficient administrative machinery with personnel who are adequately trained, well-equipped and motivated.
- Tax administration machinery should have an effective redress and refund system so that disputes can be settled easily and corruption checked
- Contrary to the erstwhile practice of practice of obsolete tax laws and rates, there should be a continuing review of tax-related issue to align these macroeconomic targets for promoting efficient fiscal policy.
- Proper education and training of tax officials along with provision of necessary infrastructure and equipment to carry out their duties is necessary.
- Adequate number of qualified tax officials should be employed as it is the gross insufficiency of qualified manpower and equipment that is responsible for contracting tax duties to external consultants at huge costs which defeats the idea of economy as a tax principle and
- finally, there should be harmony in the objectives of tax reforms and other industrial and stabilization policies. Furthermore, strategies of tax reforms should be properly articulated for better results.

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SAVING THE EURO: CREATING SOCIAL REGIONAL CURRENCIES, TAXES ON FINANCIAL TRANSACTIONS, AND MINIMUM INCOME PROGRAMS

Abstract

This paper proposes the creation of regional currencies, which we call social currencies (pesetas, dracmas, liras; deutsche mark) with the finality of financing minimum income programs and microfinance programs in Europe. The backing for this currency will be Euros collected based on the creation of taxes on regional financial transactions. Depending on the tax rate the amount of money collected can be substantial and can be used to buy to buy government bonds of countries with severe funding problems.

Keywords

Basic income, Minimum income, Quantity theory of money, Social currencies, Taxes on regional financial transactions, Tobin tax

1. Introduction

In all the proposals that we have read so far to solve the European crisis, not one submitted what we believe to be an essential element: the creation of regional currencies, which we call social currencies; the name could be better but what we have in mind with this name is that this currency includes an essential social component, which is job creation; there is nothing new with alternative currencies that circulate side by side with the national currencies of countries with monetary problems, and this has already occurred in Brazil with the creation of social currencies of restricted circulation, as well as in Argentina, when the population lost its confidence in a currency subjected to ongoing and significant devaluations.

These currencies should reflect three features: the first is that the exchange rate should devalue against the euro, as one of the latter's problems is that it prevents competition by countries with less productivity, as we have already argued in an article (Basso, 2005) on exchange rate parities (criticizing the Brazilian real/US dollar exchange rate which was at the origin of the real plan); the second is that these currencies are of a transitory nature and will become extinct when economic conditions improve in European countries; the third is that as opposed to what happened in countries that created social currencies (where creation and emissions were private) creating and issuing will be under the control of central banks in order to prevent counterfeiting and unrestricted emissions.

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The backing for this currency will be Euros collected based on the creation of taxes on regional financial transactions. We put forth a similar proposal in a previous article but our concern in that text was to collect funds in order to put in place a minimum income program for those people affected by unemployment; currently the focus is another, as the social currency is intended to reactivate the economy as well as to fund a minimum income. The second essential component in our proposal is the creation of a minimum income for those affected by unemployment; this minimum income would be funded by social regional currencies, issued in accordance with each country's needs; this would not be inflationary for two reasons: recent events in the United States have raised a query on the expertise of defenders of the quantity theory of money (significant emissions do not result in significant inflation); frugal emissions give rise to product increases (consumer goods in this case).

The second essential component in the proposal is the introduction of regional financial transaction taxes, because we have found that countries such as England will veto the creation of a Tobin tax for the whole of Europe; this tax, as found when implementing the CPMF (provisional contribution on financial transactions) tax in Brazil, has an excellent collection potential depending on the tax rate, and may provide funds to partially remedy problems with budgetary deficits, reducing the debt/GDP ratio to satisfactory levels. The Brazilian experience shows that there is nothing destabilizing about enforcing this tax.

Implementing this tax should form part of a broader proposal to regulate financial resources in European countries (the most appropriate expression would be regulation of financial resources), as the very much commented solution for the social welfare state did not occur.

2. Diagnosis

Replacing national currencies by Euros was one of the European Union's relevant events, as it allowed countries to prepare a group of policies to preserve the currency's stability, while at the same time avoiding the detrimental effects of solving problems at the expense of neighbors. Nonetheless, the fact that there are economies with different productive bases (such as Germany, one of the world's most powerful economies, and Greece, which depends on its agricultural base) leads to productivity being widely different and affecting competitiveness in a number of fields in different nations. This fact has led nations to use the public sector to solve short-term problems, forgetting that only a competitive productive base will be a definite solution for their problems. Recurring public deficits to drive the economy will always charge a price if they are not followed in the long run by an increase in the government's tax basis, as has occurred now; moreover, this increase can take place only if the economies are able to compete to create revenues. This is equal to wishful thinking if the economies do not work in improving productivity, which can only take place by changing the productive base and with recurring investments.

3. The proposal

Let us assume that a country has income that can be spent by consumers, equal to 100 Brazilian Reais per annum.

Let us also suppose that circulating this income through banks could result in the public sector collecting 10 Brazilian Reais per annum as contributions on financial transactions (a simplified version of the Tobin tax). This contribution is nothing more than the provisional contribution on financial transactions (CPMF) that existed in Brazil's and Argentina's tax systems; the provisional contribution on financial transactions could be converted into a permanent contribution on financial transactions (we will preserve the same acronym to name the permanent contribution).

Let us assume that in order to back all of this anti-hunger currency, from now on named citizenship currency, the CPMF would be adopted, and the most that the government could print in this currency would be 10 Brazilian Reais, in other words, a monetary unit of the citizenship currency would be equal to one unit of Brazilian currency, the real.

Table 1 illustrates what would happen, proving that no currency would be created. As the poorer people do not have bank counts, this plan is certainly an income reallocator.

We will describe in detail the process's complete steps. To begin with, the Government will issue the equivalent of 10 Reais in citizenship currency and transfer (1) to the impoverished (although this is an important discussion topic, it is not in our scope here to discuss which of the poor will have priority treatment; the issue is complex, as an individual with a scarce income may be in worse condition than an individual not connected to the market economy, such as an Indian or an inhabitant of the Amazon region who makes a living from natural resources).

The sum transferred in this first plan should be equal to the sum collected through the permanent contribution on financial transactions (CPMF).

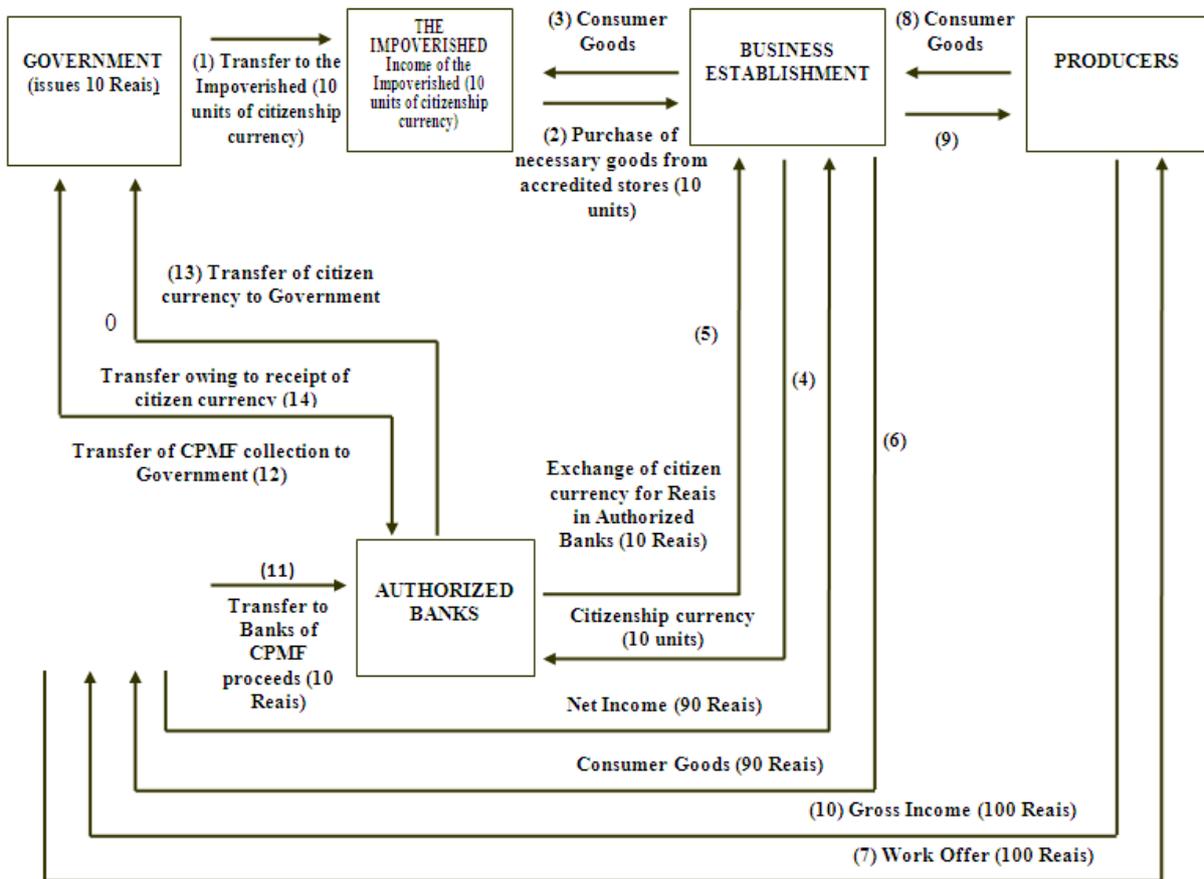


Figure 1: Issuing and Circulating Social (Citizenship) Currency (Basso)

In order to simplify, we will assume that one unit of citizenship currency is equal to one real. To start with, this currency could be spent on food only (this assumption will be discarded further on, with an argument in favor of expenditures with consumer goods, whether or not durable, or even any other kind of goods).

The unemployed having in hand a sum due to them will go to stores that sell food, (2) which would retain the food currency while at the same time transferring consumer goods to the unemployed (3). These stores will exchange the citizenship currency for CPMF tax collection in financial institutions (4) and (5).

The population with income, which at the start had 100 Reais in income, now has available 90 Reais with this income's financial transactions and the taxation on it (CPMF). The population uses up the 90 Reais in consumer goods in the retail stores (6).

The population's income originates from the provision of work to producers totaling 100 Reais (7), who produce consumer goods totaling 100 Reais. The reader, who was brought up under the principles of a classic economy, might inquire why we omitted the creation of value in production, one of the greatest discoveries of classic economists. This was done in order to simplify the reasoning, but no producer would produce if the value going into the productive process is the same resulting from the same process.

Producers sell consumer goods totaling 100 Reais to retail stores (8) and receive 100 Reais, (9) which is used to pay for the work by the population with income (10).

The banks will be in charge of retaining the CPMF funds due by the population (11).

They transfer to the Government the citizenship currency obtained from the retailers (13) at the same time that they transfer the CPMF funds to the government (12) and receive 10 Reais for transferring to it the citizenship currency (14).

Under the proposed plan, the only two unilateral transfers take place between the Government and the impoverished, and the population and the banks.

For all other transfers the path has two ways, i.e.: money is transferred from one point to another in the system, at the same time that goods or work are involved in the opposite direction.

Money issued by the Government, which is equal to creating legal tender, is offset by withdrawing income from the population through the CPMF.

It could be argued that as the money was issued before taxation, there is a likelihood that this plan is inflationary, but in truth taxation occurs during the same time span as issuing, so offsetting exists.

Albeit the currency emission is prior to taxation of the population, increased expenditure due to the excess currency (equal to 110 Reais) giving rise to a price increase, would be offset by a subsequent downturn in demand for money (equal to 100 Reais), leading to a decline in prices.

This first plan is extremely stringent, forcing retail stores to go to the banks to exchange citizenship currency for CPMF funds. This would avoid the creation of legal tender.

A milder alternative may be visualized in the structure of the “barter market” in Buenos Aires. This market, not really a barter market, arose as a result of the crisis that has overcome Argentina, where the unemployed need to exchange what they produce over a period (flow of wealth produced) and even a part of their acquired wealth (stock of acquired wealth) in order to meet their basic needs (an expression with a connotation broader than satisfying hunger). Each participant in this market receives a number of credits, depending on what he/she has to offer.

With these credits in hand, the person will search for the goods required, validating with payment (using credits) the private labor embodied in other goods.

As the credits are widely accepted and can validate private labor, they serve as a general equivalent and are therefore legal tender. The difference of what occurs in this market and the use of citizenship currency in the first plan is that now validation is broader, including not only wealth produced over the period but inventories from previous periods, which raises the question of what would happen with the citizenship currency’s value in connection with the Argentine peso (or the real if the plan were to be introduced into Brazil).

In Argentina's case, the "barter market" has already replied.

One credit unit is worth two pesos, confirming in fact what economists who believe in productivity as the exchange rate's determining factor have already demanded for a long time: The peso's devaluation vis-à-vis the US dollar.

We would not run the risk of increasing the discount, producing inflation in the citizenship currency.

Not if the number of credits (i.e.: the citizenship currency) can be kept under control and regularly exchanged in banks, in accordance with a discount specified by the market. If the goods could be exported, the discount would make the goods produced for bartering more attractive than those in the formal economy, quoted in Argentine pesos. A third more daring plan consists in the creation of a citizenship currency and allowing loans to be made in this currency, provided that they were granted under micro-credit programs, to expand the supply of food. We can use Milton Friedman's argument to demonstrate why this plan is not inflationary.

4. Several comments on the quantity theory of money

The simplest version of the quantity theory of money may be expressed as: $M \cdot v = P \cdot Y$
In which:

M = stock of means of payment, i.e.: paper money in the public's possession plus its sight deposits in commercial banks.

v = the currency's velocity of circulation

P = a price index, and in the case of the entire economy, the product's implicit deflator

Y = index for real product

This equation may be converted into a dynamic equation representing variations in time.

The variables may be named:

$$\frac{\Delta M}{\Delta t} \cdot \frac{1}{M} = \widehat{M}$$

$$\frac{\Delta P}{\Delta t} \cdot \frac{1}{P} = \widehat{P}$$

$$\frac{\Delta Y}{\Delta t} \cdot \frac{1}{Y} = \widehat{Y}$$

$$\frac{\Delta v}{\Delta t} \cdot \frac{1}{v} = \widehat{v}$$

And considering a constant velocity of circulation, we will have the equation:

$$\widehat{M} + \widehat{v} = \widehat{P} + \widehat{Y}$$

$$\widehat{M} = \widehat{P} + \widehat{Y}$$

Based on the scenario expressing the relation between gross domestic product and the amount of currency required to achieve this, we can devise at least five theories.

Three theories are devised based on the additional assumption that the velocity of circulation is constant and that the cause of inflation is an increase in the volume of money in the economy (the currency is the root of price rises).

The first of these, which we might name short-term Friedmanian, provides that the additional stock of currency will be divided between a price rise and an increase in real product. Acting prudently, the volume of currency may be increased in the same proportion as real product estimated growth. This increase may be provided by social (beneficial) currency. We might argue that short-term growth will not imply inflationary pressures if expenditures come together with increases in the gross formation of fixed capital, creating additional goods and services.

The second theory, which we might name Keynesian recessionary, upholds that an increase in supply will impact real growth only, as in depressed economies the monetary stimulus will not produce inflation as the first reason is to recover the economy from a depression (or recession). There is a parallel between this theory and what is currently happening in Europe and the United States, with massive currency emissions to recover both continents from a recession. As upheld by the Keynesian theory, expressive currency emissions may not impact on product should the process occur known as the liquidity trap. Even when unrestricted currency is available, families will not spend should they feel a threat of losing their jobs during a recession, and businessmen will not invest if they do not foresee generous times ahead to sell the goods resulting from their investments.

The third theory applies to situations in which the economy uses a significant enough portion of productive capacity and is close to full employment. In this situation, increases in the supply of currency will result in price rises as it is not possible to increase product.

A fourth version of the quantity theory assumes that the chief cause of price rises is a currency increase, but changes the velocity of circulation. This seems to be the expectation by the US, expressive increases in the volume of currency are not being converted into inflation, due to a change in the currency's velocity of circulation in a direction opposed to the increase in the volume of currency.

Under the same scenario, there are two more theories that change this cause and effect relation. We might name them Marxist and Keynesian.

In both of them, increases in the volume of currency arise from price rises and greater quantities.

Keynesian theories explain prices with mark-up theories. Once mark-ups and quantities for production are decided, products (gross domestic products) will be determined (prices multiplied by amounts). Products determine the volume of currency to realize them. Should the amount of currency be sufficient to make products, the velocity of circulation will not change. Should the amount of currency prove insufficient, the velocity of circulation will rise.

Should the amount of currency be excessive, this will affect the currency's velocity of circulation. What distinguishes Marxists from Keynesians is the micro-economic theory that explains price levels, with Marxists adopting the labor theory of value and Keynesians using the surplus theory based on goods (Sraffa) or the utility value theory.

In summary, there are several theories advocating that an increase in the amount of currency is not inflationary, and these theories support the creation of social (beneficial) currency.

5. The Tobin tax

The funds for a stricter plan of creating a social currency (without issuing any amount of currency) would originate from a Tobin tax.

There are a number of versions of a tax on financial transactions, implying various amounts in proceeds. One version involves taxation of foreign exchange markets (Kapoor, 2004). Our purpose here is not to discuss the best form of taxation on currency transactions, but to argue in favor of a successful one, the CPMF's effectiveness in Brazil with a relevant collection of funds. The CPMF is a tax applied to any financial transaction within the country. The volume of funds collected may be significant depending on the tax rate, with the advantage of not requiring international agreements to be enforced. As England did not enact the Tobin tax, the solution is found in domestic CPMFs. This tax is certainly regressive, as its rate is incident on all income brackets. I uphold that this tax is of a nature that supplants the disadvantage of a regressive nature, with its implicit dimension of solidarity; all of a country's inhabitants should be granted the means of eliminating hunger, and this is a task for all of a country's inhabitants.

6. The use of money

Tobin's initial proposal was to reduce the volatility of international capital flows, considered in the past to be destabilizing (Basso, Pinho and Silva, 2001).

We now know that capital flows are much more difficult to control when the prospects of returns are spectacular. We give an example: one of the explanations for the sub-prime crisis in the United States sustains that the huge deficits in the US balance of payments caused the crisis. The huge deficits led to incoming funds by means of the capital account, which led to growing investments, consumer spending, and indebtedness by families at levels not compatible with a balanced position.

We can foresee expenditures of the Tobin tax in numerous activities, depending on the problem we wish to grasp.

a. implementation of a minimum income program: countries suffer the impact of crises in different manners; Spain is undergoing extremely high unemployment rates; in this case the proceeds would be allocated to minimum income programs;

b. incentives to change the energy matrix: some forms of energy are deemed to be too expensive; an example is solar energy; some countries such as China are able to produce equipment for using this form of energy much more cheaply than those produced in western countries; the funds would be employed to subsidize acquisition of this equipment, still considered expensive; these funds could also be employed to produce this equipment in western countries at prices subsidized by the Tobin tax;

c. micro-credits to organize small businesses: minimum income is effective over consumer activity; an alternative is to encourage the formation of gross investment capital by small entrepreneurs, with a view to job creation;

d. changes in transport infrastructure: this is an extremely necessary use of funds in emerging countries such as Brazil (and other Latin American countries), which ignored railway transportation.

I will explain with an example. Table 1 reflects a series of revenues that we deem relevant to fund railroad transportation (taken from an end-of-course paper by Karine Bincoletto (2010). The first column shows current revenues for two metropolitan regions in the state of São Paulo (Campinas and São Paulo). As these are two very populous regions, the sums would be employed to fund the railroad system in these regions. The percentage in question will be 1%.

The second column reflects taxation on motor vehicles. As vehicles contribute to degrade air quality, the percentage in question will be 10%.

The third column refers to revenues from the state of São Paulo's value-added tax (ICMS tax). As the railroad system produces positive externalities, 1% of the entire state's revenues will be allocated to build the system in two regions. The fourth column shows a Brazilian version of the Tobin tax (CPMF – provisional contribution on financial transactions). In Brazil the tax rate was high (0.38%) and we allocated 21% to build the railroad system, which represents the state of São Paulo's share in Brazil's population.

An alternative step was the idea of using a portion of the state of São Paulo's IPVA (motor vehicle tax) revenues to reactivate railways. The idea is to allocate 10% of this tax to build the São Paulo – Campinas railroad. As for the ICMS tax collected in the state of São Paulo, 1% of its value will be employed in the construction. With regard to the ICMS tax, a sum was calculated to be allocated to the state of São Paulo if the criterion were based on population. And by means of the figures found, it is possible to calculate how many kilometers could be built by means of these three methods.

	CURRENT REVENUES*	IPVA**	ICMS***	CPMF****
TOTAL	42,463,513,954	8,789,600,000	77,202,300,000	36,483,000,000
PERCENTAGE	424,635,140	878,960,000	772,023,000	7,661,430,000

* 1% of current revenues by the municipalities in the metropolitan region of São Paulo and Campinas for 2008; ** 10% of the sum collected by the state of São Paulo for 2009; *** 1% of the sum with regard to the state of São Paulo for 2009; **** sum equal to 21% of the total CPMF, the state of São Paulo's percentage share in the country's population.)

Table 1: Percentage of sums from sources of funding – (data in Brazilian Reais for 2008; Bincoletto and Simone, 2010)

Table 2 demonstrates costs per km of three kinds of railway transportation, monorail, light rail vehicle, and high-speed train.

COST PER KM	
MONORAIL	R\$ 75 MILLION
LRT	R\$ 66 MILLION
HST	R\$ 67.7 MILLION

Table 2: Costs per km for the three railway modals (Bincoletto and Simone, 2010)

Lastly, table 3 gives an approximate idea of how many kilometers could be built, and was obtained by dividing the contribution from each source (current revenues, ICMS, IPVA CPMF) by the cost per km for each kind of railway transportation (as an example, with 1% of current revenues we could build 6.4 km annually for a light rail vehicle, 6.3 km for a high-speed train, and 3.3 km for a monorail).

	MUNICIPAL CURRENT REVENUES	IPVA	ICMS	CPMF
LRT	6.4 KM	13.3 KM	11.8 KM	116.1 KM
HST	6.3 KM	13.0 KM	11.4 KM	113.2 KM
MONORAIL	5.7 KM	11.7 KM	10.3 KM	102.1 KM

Table 3: Estimate of kilometers built for each kind of railway transportation (Bincoletto and Simone, 2010)

These sums evidence that the option for rebuilding the railroad system is more political than financial, as funding can be obtained.

Use of the four sources of funding (in amounts that could be supported by the municipalities and the state government) would allow building 147.6 km of light rail vehicle tracks, 143.9 km of high-speed train tracks, and 129.8 km of monorails.

As we have upheld that the production of commodities embodies in the system's own concept the likelihood of crises, because all goods need to perform their salto mortale, we consider it prudent to include other forms for the system to function, apart from the production of commodities. To reduce the burden on public budgets, this great effort to rebuild the railway system could employ the work of the prison population in the state of São Paulo, which would earn less but on the other hand would have their sentences reduced, and could work as employees of public-private railroad systems.

There are other serious structural problems in Brazil, such as the system for gathering and treating sewage, which does not cover significant portions of the inhabitants of Brazilian cities and gives rise to a loss in environmental quality, as the waste is dumped in rivers; This is a problem that requires an urgent solution and the proposal outlined here could contribute with part of the funds (Basso, Pinho and Silva, 2001).

7. Conclusion

If there are funds to rescue and save banks (salvage financial capital), there should be funds to save persons. As the socialism that we know has killed individual liberties and created brutal dictatorships (the Soviet Union, Cambodia, east European countries) that took the lives of millions of people, and capitalism has proved to be a perverse system that has created millions of unemployed and progressively degrades the environment, the need arises to think and propose alternatives to partly replace the production of commodities, that as Marx showed brings in its conception the likelihood crisis. The plan outlined is a proposal in this direction.

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TRADE-OFF THEORY VS. PECKING ORDER THEORY – EMPIRICAL EVIDENCE FROM THE BALTIC COUNTRIES³

Abstract

Capital structure is of particular importance in estimating the company value; an accurately estimated and selected equity and debt ratio can maximize the company value and minimize the cost of capital; therefore, this issue is especially significant in the changing conditions of economic development. The main purpose of this study is to simultaneously evaluate the pecking order and trade-off theories of capital structure and determine which one performs better for a sample of companies from the Baltic states. Analysis is conducted on a sample of 75 listed companies (Baltic Stock Exchange) over the period from 1998 to 2011. The authors test theories using panel data and regression analysis. The empirical results show that listed companies in Latvia, compared to the other countries, can be characterized by the lowest debt ratio, however an increase in the average debt ratio can be observed, therefore the gap has been reduced in the recent years. The study did not find evidence supporting pecking order theory, but results show that companies adjust their debt levels according to target debt.

Keywords

Capital structure, Debt ratio, Leverage, Pecking order theory, Trade-off theory

1. Introduction

Capital structure is of particular importance in estimating the company value; an accurately estimated and selected equity and debt ratio can minimize the cost of capital and maximize the company value, and, consequently, the value for shareholders.

The starting point for the subject of capital structure is the irrelevance proposition of Modigliani and Miller (1958, 1963). Since then, enormous number of papers were published on optimal capital structure and capital structure theories. Although in recent decades many compliance tests have been carried out in various countries and various industries, there are still many unanswered questions and problems.

In capital structure literature, two capital structure theories prevail – the trade-off theory and the pecking order theory. Pecking order theory states that companies prioritize their sources of financing – at first they prefer to use internal funds, then to borrow, and at last to issue equity as a last resort; consequently there is no clear target debt-equity mix (Myers

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and Majluf, 1984). Trade-off theory argues that company chooses debt and equity mix by balancing the benefits and costs of debt. If company increases its leverage, the tax benefits of debt increase, as well. At the same time, the costs of debt also rise (Kraus and Litzenberger, 1973). The pecking order theory expects a negative relationship and the trade-off theory expects a positive relationship between profitability and leverage.

The aim of the research is to simultaneously evaluate the pecking order and trade-off theories of capital structure and determine which one performs better for a sample of companies from the Baltic states.

The tasks of the paper are as follows:

- To overview the results of previous research made in this field;
- To evaluate the pecking order and trade-off theories on a sample of 75 listed companies;
- To determine which theory performs better for a sample of companies from the Baltic states.

The research methods used in the paper include the following qualitative and quantitative methods: the monographic method, descriptive statistics, regression analysis, graphical method. The research is based on published papers on the pecking order and trade-off theories, as well as information provided by the Baltic Stock Exchange (financial statements). Analysis is conducted on a sample of 75 listed companies (Baltic Stock Exchange) over the period from 1998 to 2011.

2. Literature review

The pecking order theory states that companies prioritize their sources of financing – at first they prefer to use internal funds, then to borrow, and at last to issue equity as a last resort. The reason of such hierarchy is the information asymmetry, since managers know more about the company performance and future prospects than outsiders. Managers are unlikely to issue company shares when they believe that shares are undervalued, however they are more inclined to issue shares when they believe they are overvalued. Shareholders are aware of this and they may interpret a share issue as a signal that management thinks the shares are overvalued, and, in response, shareholders might increase the cost of equity. There is no clear target debt-equity mix. The pecking order theory does not deny that taxes and financial distress can be important factors, however they are less important than manager's preference for internal over external funds and for debt financing over new issues of common stock.

The trade-off theory states than an enterprise chooses debt and equity mix by balancing the benefits and costs of debt. If the enterprise increases its leverage, the tax benefits of debt increase, as well. At the same time, the costs of debt also rise. The original version of the trade-off theory grew out of the debate over the Modigliani-Miller theorem. Kraus and Litzenberger (1973) formally introduced the tax advantage of debt and bankruptcy penalties into a state preference framework. The trade-off theory predicts that target debt ratios will vary from enterprise to enterprise. Companies with safe, tangible assets and plenty of

taxable income ought to have high target ratios. Unprofitable companies with risky, intangible assets ought to rely primarily on equity financing.

According to Myers (1984), a company that follows the trade-off theory sets a target debt-to-value ratio and then gradually moves towards the target. The target is determined by balancing debt tax shields against costs of bankruptcy. Frank and Goyal (2005) break Myers' definition into two parts:

- Definition 1 – the static trade-off theory – a company is said to follow the static trade-off theory if the leverage is determined by a single period trade-off between the tax benefits of debt and the costs of bankruptcy.
- Definition 2 – target adjustment behaviour – a company is said to exhibit target adjustment behaviour if the company has a target level of leverage and if deviations from that target are gradually removed over time.

Previous empirical research of evaluating the efficiency of both the pecking order and trade-off theories has provided mixed results.

Shyam-Sunder and Myers (1999) find that the pecking order is an excellent descriptor of corporate capital structure and the target adjustment model performs good as well. When both models are tested together, the pecking order results change hardly at all, however performance of target adjustment model decreases.

Frank and Goyal (2002) test the pecking order theory on publicly traded American enterprises from 1971 to 1998. According to the results, net equity issues track the financing deficit more closely than do net debt issues. While large enterprises show some aspects of pecking order behavior, the evidence is not robust.

Byoun and Rhim (2003) conclude that enterprises adjust their debt levels according to target debt ratios, as well as the pecking order.

De Medeiros and Daher (2005) tested the pecking order theory in Brazilian companies. It was concluded that in its weak form the theory is applicable to Brazilian companies, but not in the strong form.

The study done by Sanchez-Vidal and Martin-Ugedo (2005) used a panel data analysis of Spanish companies. The results show that the pecking order theory holds for most subsamples analyzed, particularly for the small and medium-sized companies and for the high-growth and highly leveraged companies.

Seppa (2008) investigated 260 Estonian non-financial enterprises, using financial statements of 2002/2003 or 2003/2004 and found the support for pecking order theory, however in the long run the evidence supporting this remains weak. The results provide no or very weak support that the trade-off theory is followed in the long-run.

Cotei and Farhat (2009) find that managers tend to adjust toward target leverage but this does not prevent them from deviating from this target to take advantage of the equity market conditions and the information asymmetry problem.

Mukherjee and Mahakud (2012) conclude that the trade-off theory and pecking order theories are not mutually exclusive. The companies do have certain target ratio and the costs and benefits of debt as well as asymmetric information costs play a significant role for the determination of optimal leverage ratio for Indian manufacturing companies.

Mazen (2012) used a French panel data to examine the validity of the static trade-off theory and the pecking order theory. This study can not formally reject either one of the two theories, however it confirms the importance of considerations provided by the static trade-off theory.

Amaral et al. (2012) used a sample of non-financial Brazilian companies from 2000 to 2010. The study concluded that the companies follow the pecking order theory, however, no evidence was detected, which states the trade-off theory.

Though many research studies had been undertaken in the field of the pecking order and trade-off theories, the results are still unclear. Some studies support the pecking order theory or the trade-off theory, while other studies both of them or none at all.

3. Sample description

The data used is taken from the NASDAQ OMX Baltic (financial statements). The financial companies were excluded, because their characteristics are different due to the specific balance sheet structure. Data used are from the period of 1998–2011. Chart 1 shows the allocation of companies used in this study.

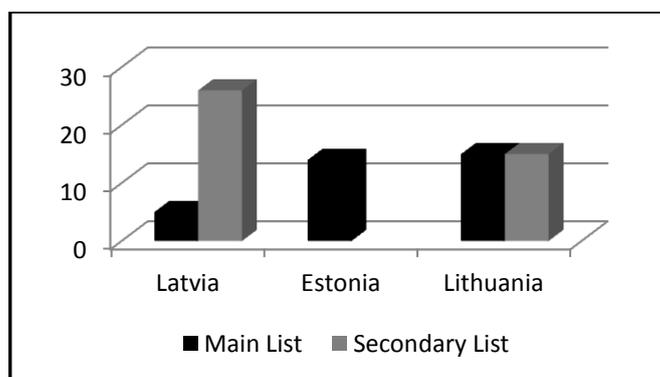


Chart 1: Baltic listed companies (NASDAQ OMX Baltic) on 18.11.2012

Companies represent different industries. Most represented industries are consumer goods (27 companies or 36%) and industrials (12 companies or 16%).

Table 1 provides descriptive statistics of the companies included in the study:

- Average debt ratio in Latvian listed companies increased from 10.8% in 1998 to 20.2% in 2011, however debt ratio of Estonian and Lithuanian companies fluctuated in a narrower range. Debt ratio of Estonian companies varied from 20.0% to 35.4% (average 28.8%) and debt ratio of Lithuanian companies changed even less - from 23.9% to 29.8% (average 26.6%);

- The median debt ratio also differs. In Latvia from 1998 to 2004 median debt ratio was mostly less than 10% (except 2003), however, it increased in the following years. Companies in Estonia show much higher median debt ratio; the smallest median debt ratio observed in 1999 (19.5%) and the highest in 2003 (46.0%). In Lithuania the median debt ratio fluctuated less so – from 20.9% (2002) to 30.7% (2008);
- Maximum debt ratio in two cases exceed 100% - this is due to negative equity (Latvia and Lithuania, 2010).

Year	Latvia			Estonia			Lithuania		
	Average	Median	Max	Average	Median	Max	Average	Median	Max
1998	10.8	8.7	25.7	28.0	26.9	40.1	23.9**	23.9**	23.9**
1999	14.5	0.3	45.7	20.0	19.5	30.4	28.8**	28.8**	28.8**
2000	15.7	7.7	46.6	24.5	24.5	39.3	26.2**	26.2**	26.2**
2001	11.7	4.5	54.8	27.0	28.3	45.4	27.1**	27.1**	27.1**
2002	13.1	6.8	54.6	34.1	41.4	54.7	25.1	20.9	77.8
2003	13.5	11.7	33.6	35.4	46.0	59.9	24.9	25.1	70.5
2004	15.7	9.1	60.8	34.5	44.4	65.6	26.8	25.9	88.3
2005	15.5	14.6	60.4	32.1	32.7	55.4	27.9	24.8	80.2
2006	18.3	13.7	64.8	26.8	28.6	57.7	26.0	27.6	58.9
2007	23.0	14.2	75.1	24.5	19.3	55.8	25.6	23.5	57.2
2008	22.7	17.2	73.6	29.3	27.7	59.0	29.8	30.7	61.3
2009	23.3	20.3	78.5	31.3	32.6	60.7	28.9	25.8	69.2
2010	23.3	15.0	153.5*	28.2	27.3	57.1	26.8	21.7	138.3*
2011	20.2	17.2	61.9	27.5	26.8	53.3	24.4	23.5	68.1

*Max debt ratio exceeds 100% due to negative equity.

**Only one Lithuanian company included in the sample (1998–2001).

Table 1: Descriptive statistics of the debt ratio for a sample of companies from Baltic countries, 1998–2011
(Data calculated by the authors of the paper, using NASDAQ OMX Baltic data)

Chart 2 provides information on the average debt ratio for Baltic listed companies from 1998 to 2011. If one compares the three Baltic countries, then the average debt ratio was the smallest for Latvian listed companies for all period in question. The average debt ratio for Lithuanian and Estonian listed companies was similar, except for the period from 2002 to 2005, when the average debt ratio for companies in Estonia was considerably higher than for companies in Lithuania. It can be pointed out that, in Latvia, one can observe an increase in the average debt ratio – three years moving average increased from 13.7% to 22.3% (for example, the same average for companies in Estonia increased by five percentage points from 24.2% to 29.0%). At the end of the period in question, the average debt ratio in listed companies in Latvia is close to the average ratios in other Baltic countries.

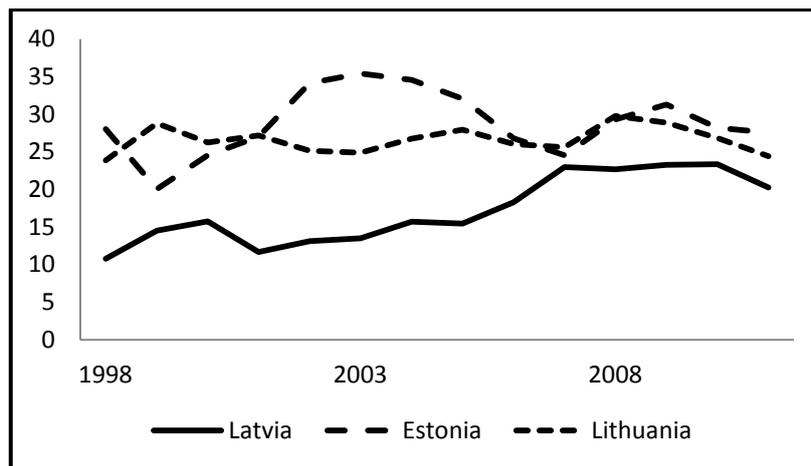


Chart 2: Baltic listed companies – debt ratio, 1998–2011 (Data calculated by the authors of the paper, using NASDAQ OMX Baltic data)

In general, listed companies in Latvia can be characterized by the lowest debt ratio, however, an increase in the average debt ratio can be observed as well, therefore the gap has been reduced in the recent years. The average debt ratio for companies in Lithuania and Estonia was similar for the most number of periods and it fluctuated and increased less than in Latvian companies.

4. Methodology

In this study, in order to test the pecking order and the trade-off theory, the methodology by Shyam-Sunder and Myers (1999) is used.

For the pecking order theory Shyam-Sunder and Myers propose time-series hypothesis. The funds flow deficit is:

$$DEF_t = DIV_t + X_t + \Delta W_t + R_t - C_t, \quad [1]$$

where

DIV_t – dividend payments,

X_t – capital expenditures,

ΔW_t – net increase in working capital,

R_t – current portion of long-term debt at start of period,

C_t – operating cash flows, after interest and taxes.

Then tested the following regression:

$$\Delta D_{it} = \beta_0 + \beta_1 DEF_{it} + e_{it}, \quad [2]$$

where ΔD_{it} is the amount of debt issued (or retired if DEF is negative). The pecking order coefficient is β_1 and is expected to be 1. β_0 is the regression intercept and e_{it} is the error term.

As pointed out by the authors, this does not include equity issues or repurchases, since the pecking order theory predicts that the enterprise will only issue or retire equity as a last resort. They admit that this equation cannot be generally correct, but it is a good description of financing.

For the trade-off theory they propose the following target adjustment model and regression specification:

$$\Delta D_{it} = \beta_0 + \beta_1(D_{it}^* - D_{it-1}) + e_{it} \quad [3]$$

D_{it}^* is the target debt level for enterprise i at time t . β_1 is target-adjustment coefficient. The hypothesis to be tested is $\beta_1 > 0$ (indicates adjustment towards the target) and also $\beta_1 < 1$ (implies positive adjustment costs). Target debt level is unobservable, the authors use three-year moving average. β_0 is the regression intercept and e_{it} is the error term.

This methodology has already been extensively used and modified. For example, the test of the pecking order theory is used by Amaral et al. (2012), Mazen (2012), Cotei and Farhat (2009), Byoun and Rhim (2003), Frank and Goyal (2002) and the test of the trade-off theory is used by Mazen (2012), Cotei and Farhat (2009), Byoun and Rhim (2003).

5. Analysis of results

Table 2 summarizes the results on the pecking order theory in the Baltic countries. Aim of the test was to state whether the companies follow pecking order theory.

Year	Adjusted R Square	Regression Significance	Regression Coefficient	
			DEF	Sign.
1999	0.41*	0.04	1.03*	0.04
2000	0.84*	0.00	0.64*	0.00
2001	0.08	0.15	0.25	0.15
2002	0.99*	0.00	0.74*	0.00
2003	-0.01	0.45	0.02	0.45
2004	0.42*	0.00	-0.07*	0.00
2005	0.08*	0.01	-1.14	0.01
2006	0.88*	0.00	0.73*	0.00
2007	0.06*	0.02	0.08*	0.02
2008	0.51*	0.00	0.22*	0.00
2009	0.40*	0.00	0.12*	0.00
2010	0.21*	0.00	-0.06*	0.00
2011	-0.01	0.82	-0.02	0.82

*An asterisk indicates significance at the 5% confidence level.

Table 2: Results of the pecking order theory regression in the Baltic countries, 1999–2011 (Data calculated by the authors of the paper, using NASDAQ OMX Baltic data)

In ten out of the thirteen periods analysed, regression is significant, however the adjusted R square varies from 0.06 to 0.99. Only in three periods the adjusted R square is more than 0.80 (2000, 2002, 2006) and the corresponding regression coefficient values are 0.64, 0.74 and 0.73 (significance 0.00). Therefore there is not enough evidence that the companies in the Baltic countries follow the pecking order theory.

In Table 3, the data are summarized for each country. In the case of Latvia, for eleven periods the regression is significant, however in seven periods the regression coefficient is negative or close to 0 (this coefficient should be 1 if the companies follow the pecking order theory). Similar situation is in Estonia – regression is significant in ten periods, in seven periods adjusted R square is more than 0.80, however the regression coefficient is not 1, but, just like in Latvia, in most cases close to 0 or negative. In Lithuania only data from 2003 are available for pecking order theory analysis. In five periods out of nine, regression is significant. Even though the regression coefficient is not 1, it is not negative (common occurrence in Latvian and Estonian data).

Overall, even though there is no evidence that the Baltic countries support the pecking order theory, there is a conclusion of another kind - Lithuanian financing patterns differ from Latvia and Estonia, since Lithuanian DEF coefficient is only positive.

Year	Adjusted R Square	Regression Significance	Regression Coefficient	
			DEF	Sign.
Latvia				
1999	0.98*	0.01	-1.53*	0.01
2000	-0.17	0.64	-0.06	0.64
2001	-0.01	0.36	-0.40	0.36
2002	0.71*	0.00	-0.12*	0.00
2003	0.34*	0.00	-0.12*	0.00
2004	0.23*	0.00	0.12*	0.00
2005	0.11*	0.04	0.03*	0.04
2006	0.41*	0.00	0.31*	0.00
2007	0.92*	0.00	0.40*	0.00
2008	0.70*	0.00	0.19*	0.00
2009	0.62*	0.00	-0.03*	0.00
2010	0.93*	0.00	-0.11*	0.00
2011	0.59*	0.00	0.48*	0.00
Estonia				
1999	-0.05	0.45	-0.19	0.45
2000	0.73*	0.02	0.60*	0.02
2001	-0.25	0.98	0.01	0.98
2002	0.99*	0.00	0.75*	0.00
2003	0.36	0.07	-0.02	0.07
2004	0.76*	0.00	-0.08*	0.00
2005	0.88*	0.00	-9.8*	0.00
2006	0.99*	0.00	0.83*	0.00
2007	0.59*	0.00	-0.10*	0.00
2008	0.94*	0.00	0.19*	0.00
2009	0.88*	0.00	0.11*	0.00
2010	0.82*	0.00	-0.08*	0.00
2011	0.94*	0.00	-0.31*	0.00
Lithuania				
1999	Not enough data.			
2000				
2001				
2002				
2003	0.80*	0.00	0.77*	0.00
2004	-0.03	0.49	0.07	0.49
2005	0.21*	0.01	0.19*	0.01
2006	-0.04	0.81	-0.01	0.81
2007	0.69*	0.00	0.36*	0.00

2008	0.35*	0.00	0.40*	0.00
2009	0.37*	0.00	0.28*	0.00
2010	-0.04	0.79	0.01	0.79
2011	0.03	0.17	0.36	0.17

*An asterisk indicates significance at the 5% confidence level.

Table 3: Results of the pecking order theory regression in Latvia, Estonia and Lithuania, 1999–2011 (Data calculated by the authors of the paper, using NASDAQ OMX Baltic data)

The results on the trade-off theory in the Baltic countries are shown in Table 4 below. The analysis is done for different periods of time: 1999–2010 (all periods included in the study) and this period divided into 1999–2007 and 2008–2010 due to the economic crisis – company financial data changed considerably due to the business cycle; and if one data set (1999–2010) were to be used, it could distort the results and conclusions.

The adjusted R square in the regression is good (0.66) and in accordance to F-Anova test all regressions are significant. In all cases the regression coefficient is between 0 and 1 (in accordance to the theory).

Period		1999-2007	2008-2010	1999-2010
Adjusted R Square		0.66*	0.46*	0.62*
Regression Significance		0.00	0.00	0.00
Regression Coefficient	Coefficient	0.88*	0.56*	0.82*
	Significance	0.00	0.00	0.00

*An asterisk indicates significance at the 5% confidence level.

Table 4: Results of the trade-off theory regression in the Baltic countries, 1999–2010 (Data calculated by the authors of the paper, using NASDAQ OMX Baltic data)

In table 5 summarizes the data for each country. In Latvia, regression for period of 2008–2010 is not significant (adjusted R square negative, significance level is higher than 0.05). For the whole period in question, the regression coefficient is 0.65. In Estonia regression results are significant for all three periods and the coefficient is 0.88. Overall, it can be concluded that all three Baltic countries show similar financing behaviour in terms of target adjustment. All three regressions are significant and the regression coefficients are 0.65 (Latvia), 0.88 (Estonia) and 0.67 (Lithuania). Since these coefficients are positive and less than 1, it indicates adjustment towards the target and implies positive adjustment costs.

Period		1999-2007	2008-2010	1999-2010
Latvia				
Adjusted R Square		0.67*	-0.003	0.34*
Regression Significance		0.00	0.36	0.00
Regression Coefficient	Coefficient	1.26*	0.03	0.65*
	Significance	0.00	0.36	0.00
Estonia				
Adjusted R Square		0.67*	0.62*	0.67*
Regression Significance		0.00	0.00	0.00
Regression Coefficient	Coefficient	0.88*	1.05*	0.88*
	Significance	0.00	0.00	0.00
Lithuania				
Adjusted R Square		0.62*	0.47*	0.52*
Regression Significance		0.00	0.00	0.00
Regression	Coefficient	0.89*	0.57*	0.67*

Coefficient	Significance	0.00	0.00	0.00
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*An asterisk indicates significance at the 5% confidence level.

Table 5: Results of the trade-off theory regression in Latvia, Estonia and Lithuania, 1999–2010 (Data calculated by the authors of the paper, using NASDAQ OMX Baltic data)

To sum up, while there is no evidence that the Baltic countries support the pecking order theory, all three Baltic countries show similar financing behaviour in terms of target adjustment.

The authors propose for companies from the Baltic countries to continue adjust their debt ratios and follow the trade-off theory, because:

- Debt is cheaper than equity, therefore, company reduces financial costs;
- Tax shield – company deducts interest paid on debt from their tax liability and the company gains the so-called tax shield, which also increases company value;
- Theory implies a concrete optimal capital structure, however company can end up with a very high debt ratio if followed the pecking order theory, since equity issuance is as a last resort.

6. Conclusions

The research evaluates the pecking order and trade-off theories of capital structure and determines which one performs better for a sample of companies in the Baltic countries. Analysis is conducted using descriptive statistics and regression analysis. The study finds that:

- Though many research studies have been undertaken in the field of the pecking order and trade-off theories, the results are still unclear. Some studies support the pecking order theory or the trade-off theory, while other studies both of them or none at all.
- Listed companies in Latvia can be characterized by the lowest debt ratio, however, an increase in the average debt ratio can be observed as well, therefore the gap has been reduced in the recent years. The average debt ratio for companies in Lithuania and Estonia was similar for the most number of periods and it fluctuated and increased less than in Latvian companies.
- Even though there is no evidence that the Baltic countries support the pecking order theory, there is a conclusion of another kind - Lithuanian financing patterns differ from Latvia and Estonia, since Lithuanian DEF coefficient is only positive.
- All three Baltic countries show similar financing behaviour in terms of target adjustment. All three regressions are significant and the regression coefficients are
- debt ratios and follow the trade-off theory.

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ANALYSIS OF CROSS-SECTOR DIFFERENTIATION DURING STRATEGY FORMULATION

Abstract

Strategy as an organizational projection advocates structuring around clearly defined objectives which create market efficiency. It achieves a balance between business and environment, for the purpose of general well being (shareholders, employees, customers and the community). National work classification classifies 21 activities, which can be sorted into four sectors (primary, secondary, tertiary and quaternary). Each of them has its own special characteristics which are becoming a key component of differentiation of the sector in comparison to others. Therefore it can be assumed that the strategy of companies within each sector is set in accordance with the specificities of sector, and that there are components that differentiate strategy of a certain sector against strategies of other sectors. Objective of this work is to find specific components for the development of strategies for each sector and key components of cross-sector differentiation when setting up strategies among different sectors. The focus will be directed to the analysis of the strategical guidelines inside the different sectors, and to the comparasion of the economic and strategical growth of a sector. The research was conducted by the telephone poll with the 80 companies located in the Republic of Croatia, 20 for each sector. The first goal of this paper is to establish the level of strategical guidelines development of this croatian companies, by verifying their success in fulfilling the norms of development and used strategies. The second goal is to establish the common elements of strategy between a certain company and other companies from the same sector, meaning to verify if the companies inside the same sector form their strategies in a similar manner. This will be used to determine the key points of the cross-sector differentiation, and to present the strategical specificals of each sector.

Keywords

Differentiation, Sectors, Strategy

1. Introduction

Business strategy is fundamental for an organization suces in the highly-developed markets, therefore the development and execution of strategy represent the pivot of the business enterprise management and reflect the demands of the contemporary market values. Such market-oriented strategical planning becomes the managerial process of maintaining and augmenting the bond between the organisation's goals and the market possibilities, with the primary focus on the accumulation of profit, growth, and the achievement of the sustainable competatible advantage. Misdirected strategical decisions may jeopardize the organisation's existance. Growing competition forces a company to create a clearer business

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strategy which will differentiate it from the rest of the market. Many global companies, unlike domestic ones, have recognized the new marketing conditions and clearly defined the direction of their business operations.

Strategical decisions are seldom uniform, due to their derivation from the appraisal of values which mainly depend of the people's opinions, perceptions and suppositions, therefore eliminating the possibility of the unique approach to the strategical decision-making, applicable to every situation, organization or person. Theorists propose the strategical process model based on the analytical and rational approach to the questions (Stacey, 1997, p. 8) „How did we get here? Where we want to go? How to get there?“. Definitions of strategy are numerous, but the one most quoted in the scientific circles is the Chandler's definition from the study *Strategy and Structure* which states: „Strategy represents setting of the company's fundamental long-term goals and tasks, declaration of the activities directions and the allocation of resources necessary to achieve these goals.“ It is a successful, creative and innovative process that demands managing the opposites (Stacey, 1997, pp. 101–112) Strategy represents the reflection of the organization's growth and the allocation of the limited resources (Abell and Hammond, 1979, p. 14). Strategy is also considered to be an inspiration throughout which we seek to achieve the finite, usually long-term goal (Meler, 2005, p. 163). The goal is defined by planning decisions which represent interactions of company and its environment, but also by factors of economical and non-economical gains of the stock-holders, employees, buyers and community. Still, due to constant changes of the internal and external elements, it is necessary to track those changes and accordingly modify existing strategy. For the strategical control to be effective, the key variables which effect the strategy efficiency must be properly recognized inside and outside of a company (Ranko, Delić and Škrtić, 1999, p. 178). The control activities encompass the control of achieved results in comparison to the set goals. If the control shows stagnation or regress, it is necessary to form a new strategy which will encourage the company progress throughout changes in the current business and the employees environment and so yield the profit gain. This initiative is called SPRINT (Dolye and Bridgewater, 1988, p. 189).

Considering previously stated components, necessary for the achievement of the high-quality strategy that would warrant the business success, we can conclude that the different companies have different response to the external and internal factors which guide the company strategy in a certain direction. A question arise: do the external factors have such notable effect that the companies inside the same sector, for which can be supposed that they have the similar external influence, guide their strategies in a similar directions.

2. Cross-sector differentiation in the strategy determination

By analyzing the strategical guidelines of numerous companies, one can notice a certain differences in the company directing and determination of focus on the key segments related to their growth and development. Companies may be grouped into the segments, inside of which exists the similar strategy-setting differentiation, which draws the conclusion that the companies from the same sector have the same strategical guidelines, therefore being differentiated from the companies from the different sectors, in regard of key

elements for the future development. Many common elements are noted, suggesting that the strategical guidance of a company has a significant effect on its further growth and development.

Therefore it is necessary to group the business activities inside the similar segments to point out their strategical specification. The national classification of business activities from 2007. divides the activities into 21 groups (NKD, 2007, 2008, p. 36), such as agriculture, forestry and fishing, up to the activities of the foreign organizations and entities. To narrow down this segregation to the less elements, we could divide the mentioned activities into the four sectors. Set into the primary, secondary, tertiary and quaternary sector, the activities are divided as agricultural, industrial and services. The primary sector activities are the one where a man finds the objects of his work in nature and by his work separates and adapts them for the further processing and consumption. The secondary economical sector comprises of the processing activities, so it often called the processing sector. The tertiary activities are services, which can be defined as untangible, immaterial, undividable activities, and currently employ most of the work force. The quaternary activities are specific services which as basic goal have the common welfare, not an individual personal gain. This division will be now shown graphically.

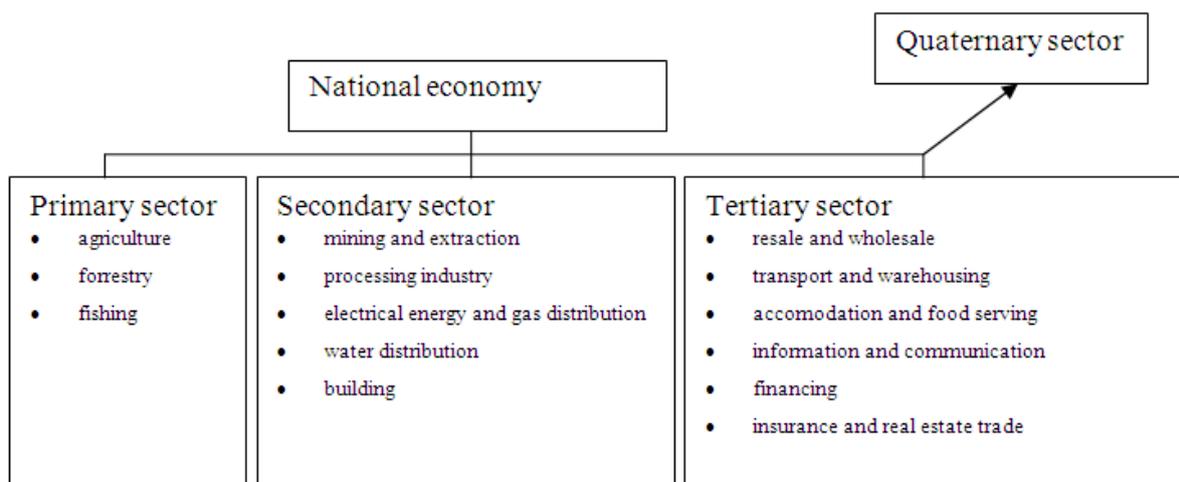


Chart 1: The structure of national economy (author)

Each of this sectors has its own specific aspects, which are the key components of the sectors differentiation. So it can be assumed that a individual company strategy inside a certain sector follows the specifical aspects of that sector. Based on the stated facts, we can draw a conclusion that there are the key components which are specifical for the same-sector companies strategies, and at the same time differentiate the strategy in relation to the other sectors strategies.

2.1. Hypothesis

The goal of this paper is to find the specific components for the strategy development of each sector, and the key components of the cross-sector differentiations used in a setting of a cross-sector strategy. The focus will be directed to the analysis of the strategical guidelines

inside the different sectors, and to the comparison of the economic and strategical growth of a sector. The research was conducted by the telephone poll with the 80 companies located in the Republic of Croatia, 20 for each sector. The first goal of this paper is to establish the level of strategical guidelines development of this Croatian companies, by verifying their success in fulfilling the norms of development and used strategies. The second goal is to establish the common elements of strategy between a certain company and other companies from the same sector, meaning to verify if the companies inside the same sector form their strategies in a similar manner. This will be used to determine the key points of the cross-sector differentiation, and to present the strategical specifics of each sector. Based on the previously presented data regarding the specific aspects of each sector, we can postulate the following two key hypotheses of this paper:

H 1. Each of these sectors has its own specific aspects which are the key components of the sector differentiation in regard to other sectors. It can be assumed that the company strategy inside each sector is following the specific guidelines of its sector.

H 2. It can also be assumed that there are components which differentiate the strategy of a certain sector in relation to the strategies of other sectors.

Analysis tried to identify the companies' strategies, and to determine their development and execution processes. The identification of the company strategy was conducted by analyzing the company's reactions to the market changes and other external influences. In addition to previous data, it was also analyzed which level of commitment is given to company's own development in search of new markets and entering new business activities. That was established by determining the level of attention given to research of internal and external environments and ability to express its own competitive advantages to achieve the recognizable and competitive strategy (Thompson, Strickland and Gamble, 2006). While analyzing the strategy guidelines, some of the questions also related to its execution.

The second part of the poll analyzes the vision and mission which many authors consider to be the most important elements of the strategical management, the stepping stone of the strategical management which provides the cultural cohesion that enables a company to function as a single collective (Buble, 2005, p. 90). This ensures the business directioning and the goal setting. Therefore, it was analyzed whether the vision and mission are focused on key factors such as customers, employees, owners and the communities within which the company operates as well as markets, technology, concern for survival, growth and increased profits. For comparison of vision, mission and goals of the companies, the analysis of directional statements was used and the analysis was based on the previously marked components.

Since McCarthy pointed out the necessity of accenting the 4P components (product, price, promotion and advertising) as the elements inside the strategy which warrant the profitability (Kotler and Keller, 2008, p. 19), the sizable part of the poll is directed towards its analysis. Research probed the level of commitment a manager shows to the market, market segmentation and the product development, and the ability to handle data while making decisions. The significant part of the poll analyzes benchmarking, which assures the safe way to forming a high-quality strategy, especially if executed with a special consideration to the Porter's „five forces“ competitive advantages (Renko, Delić and Škrtić, 1999, p. 127). And

analysis of the internal factors combined with the analysis of the external factors provides the creation of the information basis which will be foundation for the strategy development.

2.2. Methods of analysis

According to the previously stated data regarding the specific aspects of each sector, it is safe to assume that such specificity can be projected into the strategical guidelines of a certain company. Conclusion is that the quality of strategy development increases with each sector, which implies the significant difference of qualities of primary and quaternary sector in favour of quaternary sector.

Following the postulated assumptions regarding the cross-sectors differentiation in regards of the company strategy determination, next chapter will demonstrate the specificity of each sector, according to the analysis and comparison of several companies selected by random choice. Out of each sector 20 companies have been selected. Their strategies are separately analyzed, thus providing the data about their specific aspects, guidelines and the quality of production. This data was then used for inter-sector comparison, which gave us a clearer image of the sector directioning. Final analysis compared the gathered data in regard to specificity of each sector, seeking to prove existence or non-existence of the cross-sectors differentiation in the strategy development, highlighting the key components which cause the sectors differentiation.

The research was conducted by telephone poll, where the top management executives from each company stated their own positions on the strategical guidelines and the strategy-forming modes. Method of research was the Likert scale, which measured and ranked the managers' response to statements. Level of concurrence for the certain statement served to demonstrate the level of compliance to the certain issue, and to classify the strength of different sectors. The data collected through the survey questionnaire was analyzed using descriptive analysis and ANOVA test. In the text below the results of a complete analysis are presented. Designated indicators were adopted on the basis of the arithmetic mean of agreement, disagreement or lack of familiarity with specific component of company leadership.

3. Results of research

Gathered data indicate that there is a differentiation in implementation of strategies among companies of different sectors. As assumed, the specifics of each sector are reported by emphasizing the focus on essential components of strategy. In all sectors a significant emphasis was placed on quality of product or service, but businesses of primary and quaternary sectors stress out that the price is not a factor that is pointed out through strategy because it is imposed by the market. Similar data was obtained by analyzing the distribution and promotions within same sectors because the leadership believes that the market is sufficiently regulated to function by itself and requires no further emphasis of these components. It is also clear that the primary sector companies do not pay great attention to development of strategies stressing 4P components as do the other sectors. The

key to their strategy is a quality product that automatically creates demand. The following graph clearly shows that the strongest focus on the components of 4P is placed by companies of the secondary and tertiary sectors, with the lowest focus on price. Previously analyzed issue is further shown graphically in order to emphasize differentiation.

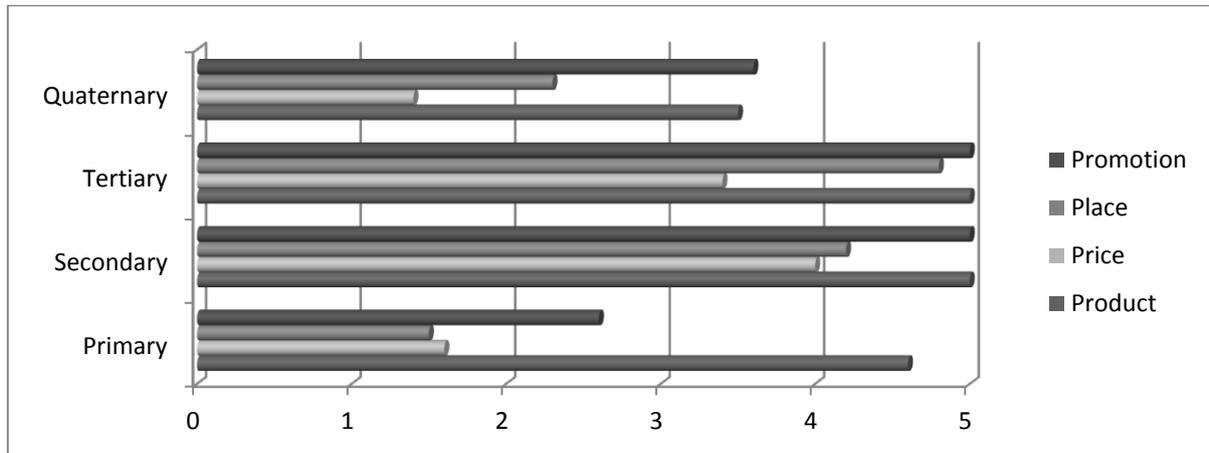


Chart 2: Cross-section differentiation when reflection on the components of 4P (author)

By analyzing the cross-sector differentiation, with strategic focus on product, by ANOVA test it is confirmed that a statistically significant difference exists between the arithmetic means of the samples (p -value is $3,4 \cdot 10^{-6}$), ie strategy of placing focus on the product is significantly different between sectors. Separately, by comparing quaternary sector with other sectors it can be concluded that there is a statistically significant difference between the arithmetic means of quaternary sector and other sectors in the attitude towards the importance of the product as a component of the 4P (with received p of 0,000335 and 0,05 in contrast to secondary and tertiary sectors). It can therefore be concluded that companies of quaternary sector do not show a strong need to emphasize product as companies of secondary and tertiary sectors do because of the specificity of the product or because of the products integration on the market.

Differential analysis on the formation of prices by using ANOVA test shows significant differentiation between sectors (p -value of $5,23 \cdot 10^{-12}$). However a separate analysis of sectors revealed no significant differentiation between primary and quaternary sectors ($p = 0.5671$) and the secondary and tertiary sectors ($p = 0.102284$), from which it can be concluded that the above sectors create price strategy in a similar way, ie the companies of secondary and tertiary sectors strongly emphasize price as a key strategic element. These assertions can be further substantiated by descriptive analysis shown below.

Groups	Product				Price			
	Count	Sum	Average	Variance	Count	Sum	Average	Variance
Primary	20	92	4,6	0,673684	20	32	1,6	0,884211
Secondary	20	100	5	0	20	80	4	1,052632
Tertiary	20	100	5	0	20	68	3,4	1,515789
Quaternary	20	70	3,5	2,894737	20	28	1,4	1,515789

Table 1: Descriptive analysis of strategic focus on product and price (author)

By analyzing strategic orientation on distribution, by using ANOVA test, results show a statistically significant differentiation between the analysis in each sector, and the overall cross-sector analysis ($p=1,37 \cdot 10^{-16}$). However, the most interesting is the analysis of focus on the promotion where a significant difference has been noted between the arithmetical means of samples ($p=1,93 \cdot 10^{-10}$), which indicates that there is a strong cross-sector differentiation in focus on promotion, although it was noted that between the primary and quaternary sectors there is no significant differentiation ($p=0,05103$). Thus we can conclude that the primary and quaternary sectors do not pay great attention to the promotion of the product, while secondary and tertiary sectors believe that the promotion is one of key components of their strategy. The above statement is shown in the following table.

Groups	Distribution				Promotion			
	Count	Sum	Average	Variance	Count	Sum	Average	Variance
Primary	20	30	1,5	0,789474	20	52	2,6	2,357895
Secondary	20	84	4,2	1,010526	20	100	5	0
Tertiary	20	96	4,8	0,378947	20	100	5	0
Quaternary	20	46	2,3	2,221053	20	72	3,6	2,568421

Table 2: Descriptive analysis of strategic focus on distribution and promotion (author)

After analysis of key components of the strategy, managers received the question whether they are using benchmarking. Following data has been collected.

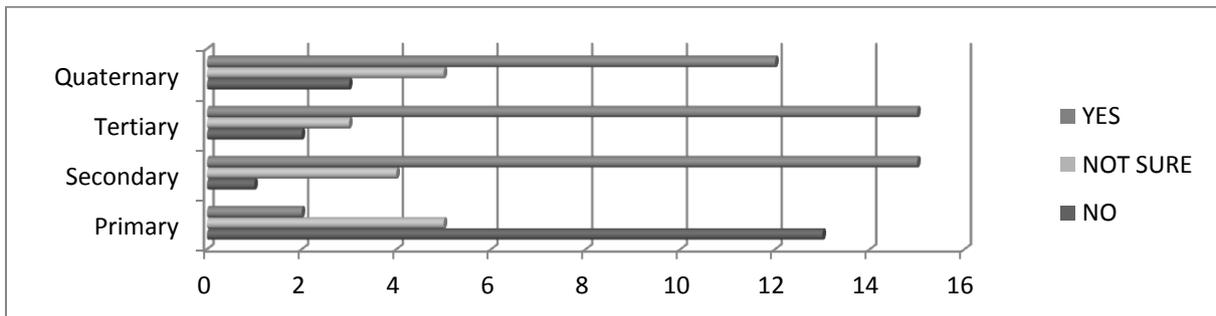


Chart 3: The data collected on the use of benchmarking (author)

And by using descriptive analysis the following indicators were obtained.

Groups	Count	Sum	Average	Variance
Primary	20	38	1,9	1,884211
Secondary	20	88	4,4	1,305263
Tertiary	20	86	4,3	1,8
Quaternary	20	78	3,9	2,305263

Table 3: Analysis of the implementation of benchmarking through different sectors (author)

From previously mentioned it can be observed that companies in all sectors except for the primary use benchmarking, which has indicated the differentiation between sectors through ANOVA test ($p=9,12 \cdot 10^{-8}$), separate analysis between sectors determined that the primary sector has influenced the reported differentiation ($p=2,5 \cdot 10^{-7}$), while among other sectors

there is no statistically significant differentiation (eg. $P=0,801$ between secondary and tertiary sectors, $p=0,25$ between secondary and quaternary sectors, $p=0,38$ between the tertiary and quaternary.).

In the analysis of key threats or five key forces according to Porter, managers in all sectors have expressed the view that the impact of existing competitors in the market is the strongest external force that has impact on the company, even though their impact is significantly lower on companies in primary and quaternary sectors than on companies in secondary and tertiary sectors. The reason for this is the specific markets and job descriptions in which competition does not have such a significant stake on the success of company operations. It is important to emphasize that managers of the primary and quaternary sectors point out that there is no concern about customers and substitution products for exactly the same reasons as stated above. However companies of the quaternary sector show a strong influence of the suppliers on its business, much stronger than companies of other sectors, particularly the primary sector.

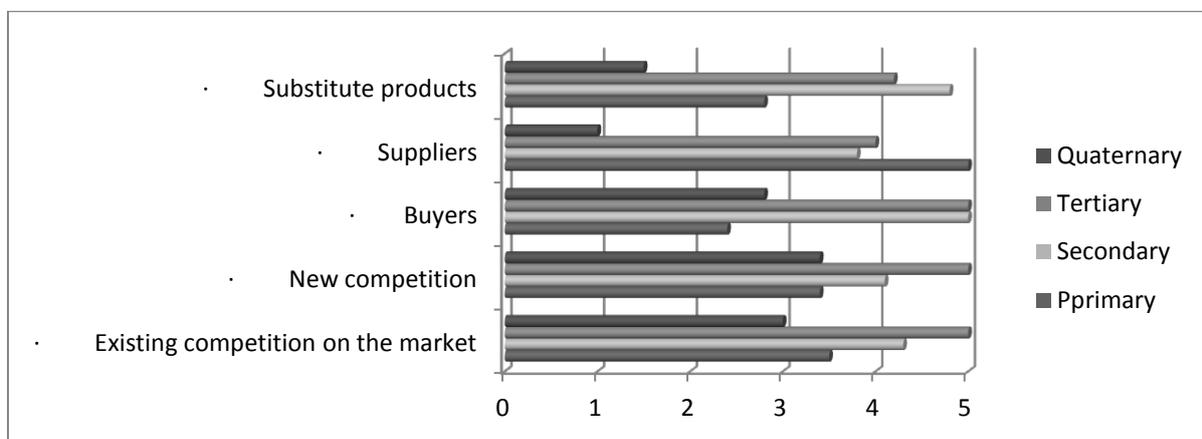


Chart 4: Key threats of companies are (author)

From chart shown above it is clearly evident that the impact of external forces is different on company's business between sectors, and it has strong implications for the creation of the company's strategy in the sector. The existence of a strong differentiation has also been proven with ANOVA analysis which at analysis of threats on the market ($p = 10,63 \cdot 10^{-5}$), analysis of the threat of new competitors ($p = 0,000528$), customers threats ($p = 6,15 \cdot 10^{-14}$), suppliers threats ($p = 2,63 \cdot 10^{-19}$) and threats from substitute products ($p = 2,12 \cdot 10^{-13}$) indicates a statistically significant difference between sectors.

Interesting results were obtained from a part of a survey that analyzed which are key components that are part of and were used in creation of the vision and mission. Managers were offered options to choose from and it is concluded that most managers believe that employees, concern for the survival, growth of the market and products are key components of strategic goals, vision and mission. It was also found that managers of primary sector consider that philosophy and self-concept are not an important component of the vision and mission, and a large percentage of them in the vision and mission statement do not include nor users nor concern for public opinion, which could be explained by the fact that companies in this sector produce intermediate products for the market which seeks them thus reducing the need for a strong attracting of buyers from the market. Regarding the

quaternary sector it can be noticed that they place a strong focus on all the components except the technology that is not considered an important strategic factor. It is important to note that companies of secondary and tertiary sectors emphasize that all of these components are very important for the development of their strategy, and it can be said that there is no significant differentiation in this segment among them.

The analysis results are listed in the following graph.

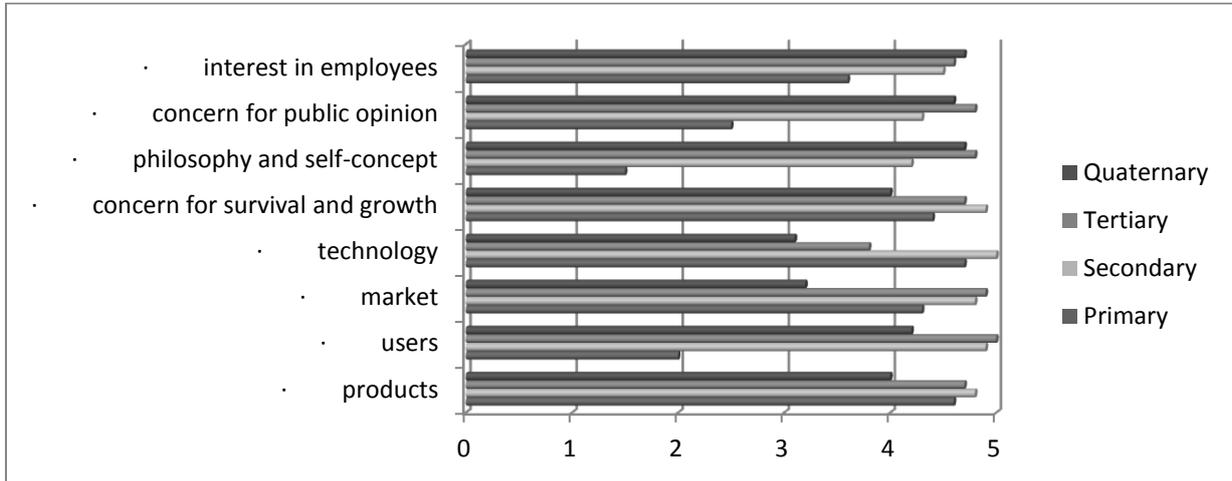


Chart 5: Key components of the vision and mission (author)

As a final component it is necessary to emphasize that the primary sector managers have suggested that strategic guidelines to subordinates are not transferred at all levels, which is a large obstacle for implementation of a strategy and a potential reason for the delay of the entire sector.

The last question asked the managers whether they think that their strategy is distinctive and competitive on the market. Gathered data is shown in the following table.

Groups	Count	Sum	Average	Variance
Primary	20	30	1,5	0,789474
Secondary	20	86	4,3	1,8
Tertiary	20	74	3,7	2,642105
Quaternary	20	80	4	2,315789

Table 4: Analysis of strategy competitiveness (author)

From the above data it can be viewed that the managers of primary sector companies are aware of the fact that their strategy is not competitive on the market and for this they are very different from the managers of companies from other sectors (in comparison with the secondary sector $p = 2,21 \cdot 10^{-9}$, with tertiary sector $p = 5 \cdot 10^{-6}$ and quaternary sector $p = 1,92 \cdot 10^{-7}$ which shows a clear differentiation). Thus it can be assumed that the under-developed strategy is a key reason for the stagnation of development of primary sector in comparison other sectors.

4. Conclusion

Each sector has its own specificities, both in business and in formulation of strategies. Analysis of sectoral specifications has shown numerous specifics. Although managers within all sectors are aware of the fact that only the product, its quality, price and access to buyers can point out the competitive advantage on the market, each of them puts the focus on the specific components that are of bigger importance to them.

In the turbulent times in which companies are currently positioning on the market a stronger focus is placed on the market, growth of the company and its survival. Main reason is the size, number and strength of competitors on the global market, to which the company is trying to counteract. Therefore, when setting up strategy employees must be a key factor in development of the company, and by stimulating them a significant progress can be achieved.

By stressing the fundamental values, beliefs, aspirations and ethical priorities of company, it becomes more important in the perception of key stakeholders, and thus it can achieve greater incentive in all its target groups for further work and effort with purpose of progress and development of company. By analyzing companies through various sectors, one can observe the existence of certain rules when setting up a strategy, but in parallel with this there is a huge difference in orientation of strategy among companies within different sectors. That form of orientation can be strictly linked to the sector within which the company is located. Thus we conclude that the strategy can be precisely directed, and that it is possible to set a narrower range of segments that a high-quality strategy should have, in relation to a particular sector, thus helping companies within a sector with a better strategic guiding.

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INCOME DISTRIBUTION AND THE MEDIUM-TERM TREND OF INEQUALITY IN THAILAND

Abstract

Income distribution in Thailand has become the central issue due to the unequal distribution between modern and agricultural sector especially in the poorest Northeast which has the greatest number of agricultural household among regions. The hypothesis on inequality which has been discussed widely is the Kuznets inverted U- curve hypothesis that income inequality increases in the early stage of economic development and decreases in the later stage. The inequality trend in the medium-term showed the downward trend after the peak of inequality in 1992. This could imply a development of Thai economy. However, income distribution and regional inequality are still problematic. Furthermore, although agricultural sector has an important role for Thai economy, the agricultural wage is still low, 2.61 and 1.69 times lower than the service and production sectors respectively. This research mainly focuses on the results of field survey in Mahasarakham and Kalasin provinces in the Northeast of Thailand. It is important to know the opinions of the people in the most unequal region. As field survey, people still would like to be supported from the government in terms of income more than other aspects but it is difficult to distribute enough support thoroughly. On the contrary, many people are satisfied with their living and not affected by the limitation of income. Moreover, gathering the group to support members could help to improve their living and without waiting only government's support.

Keywords

Income distribution, Income Inequality, Thai Economic and Social Development

1. Introduction

Income distribution has become the central issue in Thailand. The unequal distribution between modern and agricultural sector still occurs. The government have tried to increase the wage accompany with the continuous operation of the income security project to small farmers whom income is low. However, the poverty in the Northeast where contains the greatest number of agricultural household is still higher than in other regions. Although agricultural sector has an important role for Thai economy, the agricultural wage is about 2.61 and 1.69 times lower than the service and production sectors respectively. Furthermore, Agriculture is the second lowest of average income per labour amongs all production sector (Chansarn, 2009).

There was an official report of the National Statistical Office (NSO) that conducted an opinion survey on what people need from the government by regions in 2010 (Table 1).

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Region	Issue that should be prioritized	%
Bangkok	1. Poverty problem	39.4
	2. People's Debt problem	35.6
	3. Price of consumer goods	35.3
Central	1. Price of consumer goods	37.1
	2. Poverty problem	37
	3. People's Debt problem	35.2
North	1. Price guarantee for agricultural produce	41.9
	2. People's Debt problem	34.3
	3. Oil price control	32.8
Northeast	1. People's Debt problem	46.7
	2. Price guarantee for agricultural produce	40.6
	3. Poverty problem	32.4
South	1. Price guarantee for agricultural produce	34.6
	2. Price of consumer goods	33.6
	3. People's Debt problem	28.3

Table 1: *Opinion survey on what people need from the government by regions in 2010 (National Statistical Office (NSO), 2010)*

Another important point is the satisfaction of people on their living. This research is analyzed in order to know that people in the Northeast which have faced high inequality problem is satisfied their living or not as well as to understand their way of thinking.

2. Income distribution in Thailand

2.1. Overview of income distribution in Thailand

During the past 2 decades, income distribution in Thailand had some small improved. Gini coefficient which is an inequality index were about 0.49 to 0.54 in 1998 to 2009. Inequality in 2009 is 0.493. It reflects that most of benefit of economic growth and development fall among some small group especially the rich group. The 10 percent richest group shared 38.41percent while the 10 percent poorest group shared only 1.69 percent of total income (NESDB, 2011).

As estimated regional income inequality, Northeast is the region which highest income inequality for many years. Although, the inequality of the whole country was improved, inequality of the Northeast is still higher than those of other regions.

2.2. The medium term trend of inequality in Thailand

The hypothesis on inequality trend which has been referred and discussed widely is The Kuznets hypothesis of Simon Kuznets since the 1950s that income inequality increases in the early stage of economic development and decreases in the later stage. This could occur when people in the agricultural sector which relatively low per capita of income shift to industrial sector which has higher per capita of income. The income gap between two

sectors and the higher income is incentive for labour to move to the industrial one. Consequently, the expansion of industrial size with more unequal of income distribution occurs in the first period of development. However, in the later stage when the industrialization is adjusted, income inequality decrease, and narrow the income gap. This idea can be illustrated as Kuznets inverted U- curve which the inequality index such as Gini coefficient on y axis and economic development, time or per capita income on x axis. The explanation of Kuznets hypothesis can be applied not only for the case of industrialization but also for other cases when the new industry emerges such as the emergence of technological innovation or IT economy as in the developed countries. The Kuznets hypothesis has been cited and discussed in many researches on income inequality and development.

In the case of Thailand, the question that whether Thailand has already passed the turning point of the Kuznet inverted U-Curve has been discussed until the present time. There is important research of Ikemoto and Uehara (2000) that analysed income inequality and Kuznets hypothesis in Thailand include the period of the rapid economic growth of Thailand that started in the latter half of the 1980s when income inequality increased very rapidly and while the industrial sector absorbed underemployed labour force in rural areas in the early 1990s. The results of this research shows that the inequality do not show clear and consistent downward trends in the mid-1990s. However, the Kuznets' curve does not necessarily appear only once but can appear several times when new high-productivity industries appear as an N-Shape.

The medium term trend of inequality in Thailand was analysed by authors as well as consider the Kuznets curve hypothesis. We also predicted the turning point by regression. The result showed that Thailand reached the turning point in the 1990s.

Moreover, as a result of Gini coefficient estimation for the medium term trend of inequality, Thailand reached the peak of inequality in 1992 with the Gini coefficient at 0.543. This also match with the period of our prediction.

It can be seen from the figure 1 below that illustrated from the Gini coefficient from 1989 to 2009 with the Peak year and Bottom year of the Gini index. From this figure, it shows the downward trend of inequality after the peak inequality of 1992 although there was some fluctuation like N-shape but the peak trend was diminish. This could imply the development of Thai economy. However, the income distribution and regional inequality are still problem.

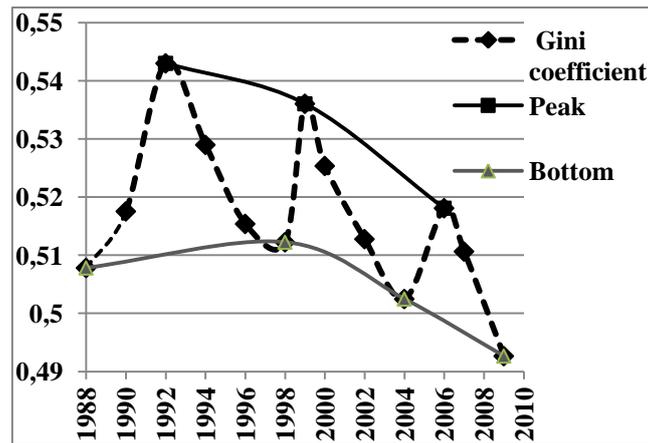


Chart 1: Trend of inequality, 1998-2009 (Authors' Estimate)

3. Field survey analysis

This part is based on field survey in Mahasarakham and Kalasin Provinces in the Northeast of Thailand in order to understand the real situation in the actual area as well as satisfaction of people despite the high inequality. The survey was conducted by interviewing 43 interviewees which consist of farmer about 55 percent, and people in other occupations which some of them do agriculture as well.

The questions can be categorized into 3 main focuses.

1. Opinion on income, occupation and income gap between Bangkok and Northeast
2. Satisfaction of current living
3. Opinion on support of the government

3.1. Opinion on income, occupation and income gap between Bangkok and Northeast

The objective of this part is to know what people think about their income, occupation and the difference of income between Northeast and Bangkok, there are only 18.6 percent think their income is higher than other people in their province, and 81.4 percent think it is not. For the question "Does your occupation provide you with higher income than other occupations in the same province?", 16.3 percent answered "yes" and 83.7 percent answered "no". The group that answered "yes" consists of both farmer and non-farmer. However, most of respondents agree that agriculturists generally earn less income than other occupations. For the question, "Is average income of your province higher than other province in the Northeast?", 16.3 percent answered "yes" and 83.7 percent answered "no". In their point of view that whether the income gap between Northeast and Bangkok is increasing or not, 83.7 percent think the income gap between Northeast and Bangkok is increasing, and 16.3 think it is not increasing. (Chart 2).

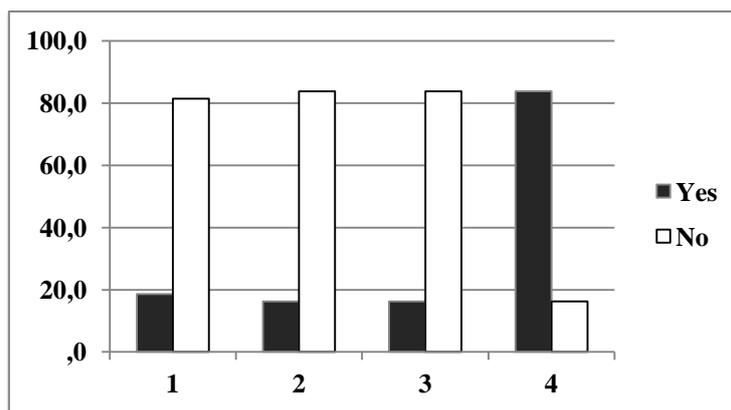


Chart 2: Opinion on income, occupation and income gap between Bangkok and Northeast (Field survey, 2012)

Note:

1. Do you think your income is higher than other people in your province?
2. Does your occupation provide you with higher income than other occupations in the same province?
3. Is average income of your province higher than other province in the Northeast?
4. Do you think the income gap between Northeast and Bangkok is increasing?

3.2. Satisfaction of current living

This section was asked in order to know that how people feel about their overall living, satisfied or unsatisfied among the high inequality situation. The question was whether they are satisfied their current living or not. The answer of interviewees was inverse to the high inequality problem. There are up to 79% of interviewees answered that they are satisfied, and 20.9% are unsatisfied (Chart 3). Both answers are from the respondents who are farmers and non-farmers.

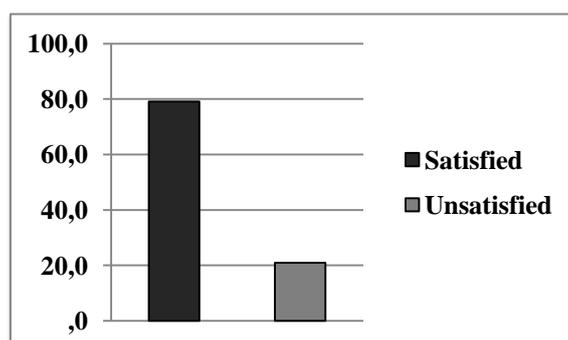


Chart 3: Satisfaction of current living (Field survey, 2012)

For the interviewees who answered "satisfied", there are 52.9 percent whose household have income more than expense (shown in the Table 2). The interesting point is the interviewees who answered "satisfied" also consist of people whose household have income less than expense 4 percent. It is because most of them feel that their current living is better than in the past. Therefore, they feel satisfied. There are 94.1 and 97.1 percent of "satisfied" group think that their current living is better comparing to 10 and 5 years ago.

In the group of people who answer "unsatisfied", in term of income condition, 77.8 percent of people who are unsatisfied their current living have income less than expense. However, 44.4 percent of unsatisfied group think their current living is better than in 10 and 5 years ago, and believe that their future will be better.

		Satisfied (100)	Unsatisfied (100)
Income	>Expense	52.9	22.2
	<Expense	47.1	77.8
Current living compare to 10 years ago	better	94.1	44.4
	same	-	33.3
	worse	5.9	22.2
Current living compare to 5 years ago	better	97.1	44.4
	same	-	33.3
	worse	2.9	22.2
Think that their future will be	better	97.1	44.4
	same	-	44.4
	worse	2.9	-
	Not sure	-	11.1

Table 2: Satisfaction of current living of interviewees by conditions (Field survey, 2012)

3.3. Support of the government

In every period, each government attempted to create many policies to provide high benefit to low income people. However, it is difficult to distribute enough support to all people thoroughly, and sometimes the benefit could not reach to low income people due to many reasons such as misapplication of policies.

The policies which were launched to elevate people's well-being not only in term of income but also quality of life. The policy which used and mentioned widely is the Universal Coverage Scheme or 30 baht for all health care which provide the access to necessary health services for only 30 baht(1 US\$). This public service could reduce health expenditure and improve quality of life for low income people. However, as field survey, some inconvenience could occur because of the equity and quality of service. There are also policies focused to support the farmer group such as dept moratorium to farmers for 3 years and price guarantee for agricultural produces.

3.3.1. Enough support or not to improve the living

As survey, when asked that "Do you think you have received enough supports from the government, and those government policies are efficient enough to improve your living?" There are 27.9 percent of respondents think those are enough while 72.1 percent think those are not enough (Chart 4).

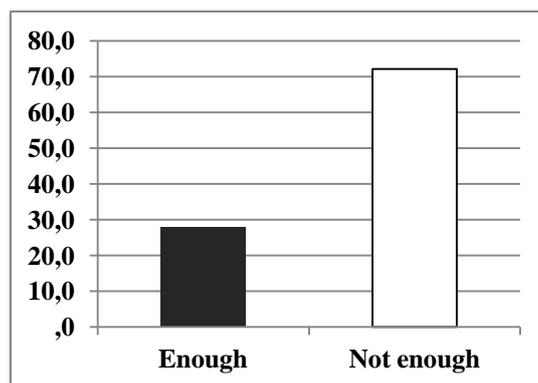


Chart 4: Supports of the government and its efficiency (Field survey, 2012)

3.3.2. Issue of Political conflict

The issue of political conflict can affect the economic and social development as well as impact on people's income and income distribution through the policy instability. In this part, we would like to know that whether they think the political conflict affected their work and life or not. The result is shown in the Chart 5. There are 51.2 percent answered “yes”, they think the conflict lead to the change to new government, discontinued policies and affect to the economy that make their living more difficult, and higher cost of living. There are 48.8 percent answered “No” because they do not pay much attention on the conflict but rely on self sufficiency.

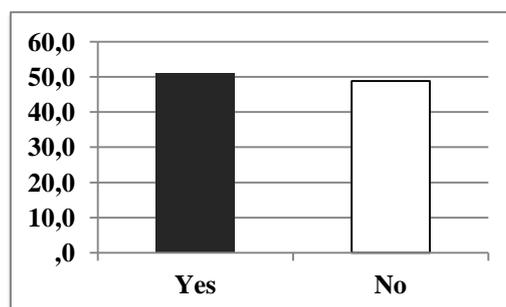


Chart 5: Political conflict affected the work and life in interviewees' opinion (Field survey, 2012)

3.3.3. Policies which people need from the government

The Chart 6 shows the policies which interviewees think the government should launch to assist people. The policies which interviewees need the government to operate for people are as follows:

1. Income, expense, and debt problem
2. Agricultural related policies
3. Electricity and water supply
4. Market for product distribution
5. Support the local group and knowledge exchange for self-sufficiency
6. Funds
7. Quality of life support such as health service and education
8. Job creating and job training
9. Same standard welfare to all people
10. Represents the opinion from people who not expect the government support.

The policy which most requested is policy to support higher income level, reduce the cost of living and solve debt problem, 26.09 percent of all requested policies. The second one is

the agricultural related policies, 21.74 percent which the policy for agricultural produce's price guarantee was included. These results are consistent with the survey on what people need from the government in the Northeast of the National Statistical Office in the Table 1.

Besides, not only support of the government, people in the local community have created the group to support member and exchange their knowledge for better living.

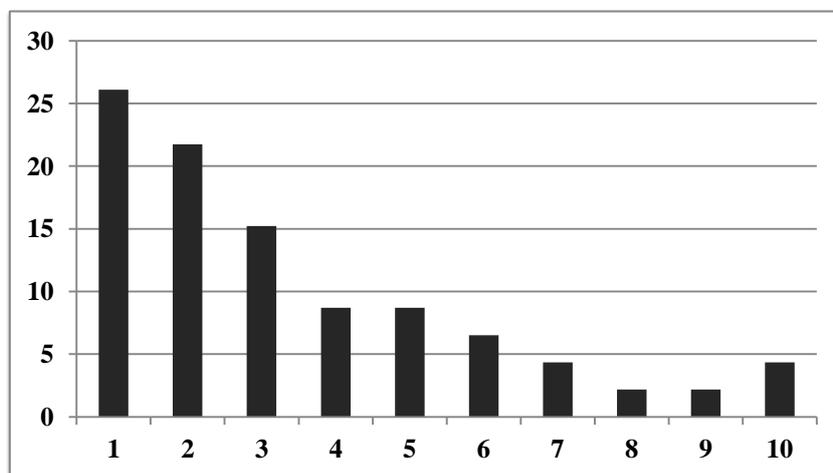


Chart 6: Policies which people need from the government in interviewees' opinion (Field survey, 2012)

Note: 1. Income, expense, and debt problem 2. Agricultural related policies 3. Electricity and water supply 4. Market for product distribution 5. Support the local group and knowledge exchange for self-sufficiency 6. Funds 7. Quality of life support such as health service and education 8. Job creating and job training 9. Same standard welfare to all people and 10 represents the opinion that not expect from the government support

4. Conclusion

Income distribution is one of the most important problem on economic and social development which difficult to eliminate within the short period. Although Thailand has already passed the turning point of the Kuznet's curve and the medium term trend of inequality showed some downward trend, the income distribution and regional inequality are still problem. It is important to receive the information from the people in the most unequal region in order to know their opinion in many aspects including satisfaction of living.

When asked interviewees to evaluate their income status, about 81.4 percent think they have lower income than other people even in the same province. There are 83.7 percent think their occupation does not provide them higher income than other occupations. Some people in non-farmer group also included in this answer. Furthermore, 83.7 percent of respondents also think the income gap between Bangkok and Northeast is increasing.

The interesting result is the answer of satisfaction of people on their living. The answer of interviewees was inverse to the high inequality problem. There are up to 79 percent of interviewees answered that they are satisfied, and only 20.9 percent are unsatisfied. Both answers are from the respondents who are farmers and non-farmers. It is because most of

them feel that their current living is better than in the past. These could be imply that income level is not always the good indicator of life satisfaction.

The policy which most requested is policy to support higher income level, reduce the cost of living and solve debt problem, 26.09 percent of all requested policiies. The second one is the agricultural related policies which is 21.74 percent.

Although, people still would like to be supported in term of income, percentage of interviewees who are satisfied their living is quite high. Futhermore, Gathering the group to support members could help to improve their living and without waiting only government's support.

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THE EFFECT OF THE EARLY ENTRANCE TO JOB MARKET ON THE HEALTH STATUS OF THE BRAZILIANS IN 2008

Abstract

The early entrance to the job market has, among other consequences, a negative effect on the health status of the individual. In 2008, nearly a sixth of the Brazilian population claimed to have started working before the age of 10 and over a third reported to have started working between 10 and 15 years old. This paper aims to investigate the effect of early entrance to the job market on the current health status of the individual. The database provided by the National Survey by Household Sampling (PNAD) for 2008 was used to reach the objective of this paper. The analysis was conducted at national and regional extent using Ordered Logit method. It was evident that delaying entrance to the job market impacts positively on the current state of health. Moreover, it was found that the educational level and personal income increase the likelihood of the individual presenting a better state of health. Distinct effects of these variables on health status were also found when we took into account the regional context. The Southeast and South showed the most severe impacts of child labor on health, as well as the best results in terms of the impact of education and personal income on health status. In contrast, the North and Northeast regions showed the greatest gender disparities related to health status.

Keywords

Brazil, Child labor, Health status, Ordered logit

1. Introduction

According to the International Labor Organization (OIT, 2012), 215 million children work at present, of which about 50% act in derogatory activities. The early entrance of the child to the labor market coerced either by the family or not, prevents them from attending school or, even, from receiving some kind of care (OIT, 2012). Child labor ravages all the continents, including the European one. In Latin America, a few studies which investigate the causes of child labor as well as its consequences, mainly for Brazil, are highlighted.

In Brazil, in 2008, 13 % of the population admitted to have begun to work before the 10 years old, which makes worrying the impact of child labor upon the future of those children and consequently upon the process of the economic development of the country (IBGE, 2008). In this sense, Kassouf et al. (2001) and Nicolella et al. (2008) claim that child labor inhibits the development of the child and, afterwards, of the grown-up individual, owing to,

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among other consequences, the impossibility of attending school. For Vietnam, for instance, Beegle et al. (2009) have found evidence that child labor negatively impacts on school performance.

Although, a great part of the works does not stress the effect of the early entrance to the job market upon health, the different ages in which a child goes into the job market possess distinct impacts on the health status of the adult person. In other words, it is expected that children who began to work before the 10 years old are more harmed in relation to the ones who enter between 10 and 15 years, for example. In Brazil, in 2008, 39% of the population admitted to have gone into the job market between 10 and 15 years old (IBGE, 2008).

The regional matter is also very important in the surveying of the relationship between child labor and health status, since in regions, as the Brazilian Northeast, the percent of individuals who claimed to have entered the job market before the 10 years old is of 16% (IBGE, 2008). In the Central-Western region, about 15% of the population claimed to have begun in the job market before the 10 years, while in the Southeast region, more developed economically— mainly as far as the industry is concerned – about 10% so stated. In the other regions, North and South, that percent is intermediary, respectively, 13% and 14%. It is advisable to highlight that other factors are also unequal, such as education, income and race and gender question.

Therefore, given that context, the present work intends to investigate the relationship between the individual's age of entrance to the job market and his current health status. Strictly speaking, it aims to survey from the construction of age ranges the effect of the delay upon the age of entrance to the job market on the health status.

In addition to that piece of information, this work counts, forthwith, with the literature review which is concerned with this theme. Afterwards, both the methodology and the main results obtained are presented. At last, the final remarks are presented.

2. General overview of the literature about the impact of child labor on health status

The literature which is concerned with the theme, although scarce, enables us to characterize in a concrete form, the research theme. Some works stand out for the theoretical discussion and others for the empirical application.

The investigation about the health status of the grown-up individual or even of the child is not recent, though; its association with child labor is so. A few pioneering works made use of theoretical models to estimate the health demand. Grossman (1972, 1975) and Wagstaff (1986, 1993) stood out for their pioneering activity in the construction and debate of such models. In Brazil, recently, Oliveira and Gonçalves (2012) investigated, specifically, the health demand from models for countable data in which the variable to be explained was the number of consultations. Although, the theoretical model aims to survey the health status, does not embrace the effect of the early entry in the job market, central aim of the study.

Some studies prioritize to identify the impact of child labor upon other variables such as personal performance. Among those works, the ones proposed by Kassouf and Santos (2010) stand out, who investigate the impact of child labor upon the future performances of the Brazilians and by Haas et al. (2011), who seeks to investigate the impact of the child's health on the performances of the same ones when they become adults (between 25 and 50 years) for the 1990's. Furthermore, Fonseca (2011) turns his attention to the theoretical aspects of the relationship between health and employment.

In the international literature, there are two works which discuss the research trouble investigated in this work for Vietnam – O'Donnell et al. (2005) and Beegle et al. (2009). The first work is intended to investigate the impact of child labor on the health status in the short and long term, controlling for other control variables as education. The authors utilized the Vietnam Living Standards Survey to perform their surveys. Among the methods used; the Two Stage Least Squares (2SLS), the Seemingly Unrelated Regression (SUR) and Bivariate Probit stand out. O'Donnell et al. (2005) measured the health from the following variables: in the short term, body mass index; and, in the long term, recurrent diseases. The authors highlighted a weak relationship, in the short term, between the child labor and health, found when utilizing the 2SLS method in differences and robust in the long term.

Beegle et al. (2009), on the other hand, making use of the same data base, found no negative evidence of child labor upon the health status. Health was measured in two manners, diseases and number of sick days and in none of them, the negative effect upon the child labor was found.

Giuffrida et al. (2005) sought to investigate the correlation between poverty and health in Brazil as well as the relationship between health and child labor. In addition, the authors surveyed the determinants of the access and utilization of the medical assistance as well of the income. The authors made use of the data base of the Brazilian Institute of Geography and Statistics (IBGE), National Household Survey (PNAD) of the year of 1998 and innovated as regards the other works for using a distinct methodology – Structural Equation Models – SEM.

In the results found by Giuffrida et al. (2005), the positive impact of education, of income, of the public availability of water and of the presence of sewerage in the home on the health status. The authors also found that there is a positive relationship between dwelling the urban area and utilization of the medical assistance. Giuffrida et al. (2005) complemented the survey in stating that this result is in accordance with the literature and agree with the expected one, for in the urban areas there is increased possibility of access, since the availability is greater. Child labor, on the other hand, negatively influenced health status, as expected.

Kassouf et al. (2001) investigated the impact of the entrance of children to the job market on the health status when adult in Brazil. The authors utilized the data of the IBGE Standard of Living Survey of 1996–1997. Among the chief results, one can highlight that the early entrance to job market is associated with poor levels of schooling and income. In addition, the percent of individuals who possess an inadequate health status is directly associated with the ones who began to work before the 15 years of age. Besides, they call the attention

to the fact that the impact of the early entrance to the job market may not be realized when the children become youngsters or young adults, but in reality, afterwards.

Nicolella et al. (2008) address that point in investigating the impact of child labor upon the health of the children in the farm sector. This work stands out in relation to the others for making use of the cohort techniques to join together these two data bases of the PNAD of IBGE - of 1998 and 2003. In short, the authors aimed to identify the children who were in the age range of 5 to 15 years in 1998 and of 10 to 20 years in 2003.

The work by Nicolella et al. (2008) proposes to correct the endogeneity problem existing among the variables health status and if the child worked in the farm sector. For that purpose, the authors made use of the Probit method with instrumental variables and found that the sector in which the child works does not possess significant impact upon his health status, but, when surveyed the children of the urban area, child labor decreased the probability for them to present a very good health status by 0.128 percent point.

In short, the international literature, mainly as far as Brazil is concerned, is still incipient, with few studies with the purpose of relating child labor with health. Therefore, this work seeks to add to that literature the discussion between the early entrance to job market and the current health of the grown-up.

3. Methodological aspects

The problem of research here suggested – effect of the entrance of children to job market upon the current health status – requires the use of methods which consider the binary or categorical dependent variable, since health status is hierarchized from very bad to very good. Therefore, the method which best fits this sort of variable, utilized in this work, Ordered Logit.

Cameron and Trivedi (2005) present that method for a model ordered with m alternatives. The same one is estimated by the Maximum Likelihood, in which the log of the function of likelihood is given by:

$$\ln L = \sum_{j=0}^m \sum_{y=i} \ln [F(\alpha_j - x_i' \beta) - F(\alpha_{j-1} - x_i' \beta)]$$

It is proper to stand out that though if one surveys the signs of the coefficients, the association among the variables is given by the estimative of the marginal effects which indicate the effect of a given regressor upon the regress and the calculation of the marginal effects is given by:

$$\frac{\partial \Pr(y_i = j)}{\partial x_i} = [F''(\alpha_j - x_i' \beta) - F''(\alpha_{j-1} - x_i' \beta)] \beta$$

The Ordered *Logit* seeks to estimate the probabilities related with the greatest category, in this case, the fifth, referent to the health status very good. Furthermore, it was intended to verify the statistical significance of the variables separately as well jointly.

3.1. Variables

The data utilized in this work are coming from PNAD for the year of 2008. It was chosen to utilize the year of 2008 for presenting, in a direct form, in the questionnaire, a question about the individual's health status. It is worth highlighting that such a report is done by the individual interviewed, which can generate measure problems, given the subjective character of the question and/or of the answer.

The dependent variable – health status– is reported in five categories: very bad, bad, regular, good and very good. Since the method utilized is the Ordered *Logit*, the original categories were kept. The early entrance to the job market was measured from the creation of age ranges which point to the age in which the individual began to work. Two variables with distinct age ranges with the objective of capture the unique impact upon the health status were constructed.

The first range consists in the age range between 4 and 9 years, while the second is concerned with the age range between 10 and 15 years. Although, one expects that both affect negatively the individual's health status, it is presupposed that the first age range degrades more health than the second one, since the chances for the child to study and develop professionally in the future decrease. The effect of that variable called, in most times, child labor, is confirmed by the literature as seen previously.

The variables selected for the survey of the determination of the health status were observed in papers with similar objectives. The previous section presents, in a short manner, those papers. However, it is noteworthy that Giuffrida et al. (2005) point to the relevance of surveying the association between health and age, education, race, among other factors. And, complementarily, O'Donnell et al. (2005) point to the gender as a determining factor in the resulting level of health. In addition to those variables, it was sought to capture other important effects such as the area in which the individual lives: rural or urban.

With the objective of measuring the impact of the age upon the health status, it was chosen for inserting a variable *age* into the model, corresponding to the current age of the individual. Age possesses a significant and negative impact upon health status, mainly, when the individual is at advanced age. That probably results from the possibility of occurring chronic diseases.

Nicolella et al. (2008), as already seen, discuss the health status, as a manner of accumulating human capital. The authors argue that the fact of a child not to work raises the probability that she possesses a more promising future, with higher levels of schooling and consequently of income. Starting from that presupposed, inserting more two control variables was chosen: years of study and personal income. The first one was constructed from the variable made available by the PNAD, *years of study*, and it is expected that it has a positive impact upon the health status. The second one was collected in the same source and as well as the previous one, a positive impact is expected.

In fact, the relationship of the variables years of study and *personal income* with the *health status* is founded on the same foundations. That means that both the variables are

correlated so that the greater the level of income more years of study possess the integrants of the home and vice-versa. It is expected that a higher level of income enables a more adequate feeding, greater access to medical and hospital services and a greater level of schooling. Besides, education also raises the income. So, it is expected that a higher level of income as well as of schooling has as a consequence better levels of health. It is realized, in that way, that there is a relationship of endogeneity between the level of income and schooling, but it is supposed that this relationship does not affect the estimates.

At last, dummies variables which represent the gender, race and the fact of an individual being or not in the urban area, were inserted. The objective in that case is controlling possible problems of omission of variables. The variable of gender takes over the value equal to 1 when is of the male gender. It is expected that being of the male gender has a positive impact upon the level of health, given the positive association with higher levels of income and consequently better levels of health.

The variable race takes over the value equal to 1 when the individual is black and has as an objective to captivate indirectly the racial differentiation in the income and educational level which impact on the individual's health status. Negative association between being a black and the health status is expected, since, in a lot of works, the racial prejudice is stressed.

The variable *urban* takes over value equal to 1 for individuals situated in the urban area. The objective is captivate the different health statuses prevailing between the urban and rural areas, grounded on a number of aspects, such as the health service offer as well as the income and schooling levels.

With the purpose of captivate different bias and not only intercept, or in other words, distinct impacts of the explicative variables about the individual's health status, estimating the following function (relationship) per region as well as at the national level was opted for:

$$health_status = f(child, age, education, sex, race, urban, income)$$

in which health status is concerned with the categorical variable (ordered logit model), *child* is represented by two variables – age ranges, *age* represents the current age of the individual, *education* represents the amount of years of study, *gender*, a *dummy* with value equal to 1 for man, *race*, also *dummy* with value equal to 1 for black, *urban*, *dummy* with value equal to 1 for individuals who dwell in the urban area and *income*, represented by the napierian logarithm of personal income.

4. Results and discussion

The model was estimated both at the nationwide and regional level, since the number of observations is high, which characterizes a good representation of the sample. It is stressed that it was chose to consider a complex sample. The econometric⁴ model presented a good

⁴ It was no presented in the work, but for references, please send an e-mail: fsilva.f@hotmail.com.

adjustment⁵, as can be observed in the coherence of the estimated coefficients. The tests indicated that the variable health status is liable to be subdivided into five categories. In addition, the comparison among the probabilities estimated for each category and the percents of them in the samples enables to survey the model's adjustment. In general, the difference between these was inferior to 0.02 (or 2%), indicating, therefore, a good adjustment. The results found are corroborated by the literature. The evidence stands out that the early entrance to job market affects both negatively and significantly the health status of the grown-up. Kassouf et al. (2001) also found that relationship for Brazil. Beegle et al. (2009) did not find that statistically significant relationship, while O'Donnell et al. (2005) found a negative and significant relationship between child labor and health. The other results, when surveyed by the literature, also presented similar relationships, although distinct magnitudes.

The range of the effect of the variables upon the health status is measured from the calculation of the marginal effects. Those effects, presented in Table 1, in general, were similar among the regions. It was found that the rise in one year of age decreased by 0.5 percent point (*p.p.*) the probability for the individual to present very good health status. The impact of the age upon the health status attenuates in the Southeast and South regions, pointing out that the older people present greater probability of showing a worse health status. Giuffrida et al. (2005) found, overall, a depreciation of health with age, but, indicating that the magnitude of that effect ranges with the gender, its being more perverse for the female.

The division into age ranges in which the individuals began to work presented robust results, such an impact being both significant and distinct. Such a survey enables us to infer that for all the geographical regions and for the country as a whole, the insertion in job market before the 10 years of age presents more severe effect on the health status than the entrance between the 10 and the 14 years of age. For Brazil, the entrance to job market before the 10 years of age decreases by 4.8 *p.p.* the chances for the individual, in 2008, to present a very good health status. But the entrance between 10 and 14 years of age decreases by 1.7 *p.p.* such chances.

Regionally, it is realized that the South and Southeast regions stand out for superior effects of the early entrance to job market on the health status. Specifically, for the Southeast region, the entrance to job market under 10 years of age decreases the chances for the individual to present a very good health status by 5.2 *p.p.*, while the entrance between 10 and 14 years of age decreases by 2.2 *p.p.* such a probability.

As far as the early entrance in the job market is concerned, in general, the results confirmed those found by Nicoletta et al. (2008) and Kassouf et al. (2001). More severe impacts in the South and Southeast with relation to the North and Northeast and Northeast were highlighted. Partially, such an effect is due to the percent of persons who declared to have at least good health. For the first two regions, that percent is superior to 77% of the sample, while for the two latter regions, such a percent is inferior. It is worth pointing out that, methodologically, the marginal effects are calculated having as a reference the greatest

⁵ One sought to consider the problem of endogeneity by estimating a *Probit* with instrumental variables, but, the results were very similar, except some signs for some regions.

category of the dependent variable, or in other words, considering the very good health status.

	BR	NO	NE	SE	SU	CO
Age	-0.005*** (0.000)	-0.004*** (0.000)	-0.004*** (0.000)	-0.005*** (0.000)	-0.005*** (0.000)	-0.004*** (0.000)
Age 1 (4-9 years)	-0.048*** (0.002)	-0.034*** (0.005)	-0.034*** (0.004)	-0.052*** (0.006)	-0.061*** (0.006)	-0.045*** (0.005)
Age 2 (10-14 years)	-0.017*** (0.002)	-0.014*** (0.004)	-0.010** (0.003)	-0.022*** (0.003)	-0.027*** (0.004)	-0.018*** (0.004)
Years of study	0.014*** (0.000)	0.009*** (0.000)	0.007*** (0.000)	0.016*** (0.000)	0.017*** (0.000)	0.016*** (0.000)
Personal Income	0.010*** (0.000)	0.005*** (0.000)	0.006*** (0.000)	0.012*** (0.000)	0.009*** (0.000)	0.008*** (0.001)
Gender	0.045*** (0.001)	0.041*** (0.004)	0.047*** (0.002)	0.042*** (0.002)	0.036*** (0.004)	0.053*** (0.004)
Black	-0.007** (0.003)	0.004 (0.007)	-0.004 (0.004)	-0.010* (0.005)	0.007 (0.01)	-0.014* (0.007)
Urban	0.002 (0.004)	-0.012 (0.010)	-0.022*** (0.006)	0.013 (0.009)	0.018* (0.01)	-0.004 (0.011)

*, ** and *** denote significance at 10%, 5% and 1% respectively.

Table 1: Marginal Effects for the Health equation for the year of 2008 (Results of research)

With relation to the educational level, it was found, as expected and pointed by the literature, a positive association with the health status. Therefore, a higher schooling level increases the chances for the individual to present a very good health status. For the country as a whole, the increase of one year of study increases raises by 1.4 p.p. such chances. From among the regional discrepancies, the one which takes places between the Northeast and South region stands out, in which, in the former region, the increase is of the magnitude of 0.7 p.p., while in the latter is of 1.7 p.p..

Personal income impacted positively on the health status, indicating that, for the country as a whole, for instance, the increase of a unit in the income brings about a rise by 1 p.p. in the probability for the individual to present a very good health status. In that sense, the increase by R\$ 100 (local currency) in the personal income, and everything else constant, increases by about 4.6 p.p the chances for the individual to have a health status considered very good.

The effect of the personal income upon the health status possesses distinct impacts on the regions of the country. The North and Northeast regions proved less sensitive than the other regions, pointing out that the income increase by R\$ 100,00 (local currency) for the North, for example, increases by 2.3 p.p. the chances for the individual to have the health status considered very good, while in the Southeast is of only 5.5 p.p. the increase of that probability.

Gender showed itself as a significant factor in determining the chances for one to have a health status considered very good, which possibly, can be explained by its correlation with

the income level. Giuffrida et al. (2005) point to the distinction in health status coming from gender, but, as previously stressed, estimated the models separately, which is not done in this paper. Nicolella et al. (2008) also corroborate such result – males present increased probability of having a better health status.

In fact, for the country as a whole, being of the male gender increases by 4.5 p.p. the probability for the individual to present a very good health status. It is noteworthy to highlight, in that sense, the regional discrepancies verified. For instance, for the Central-West region, being a male increases by 5.3 p.p. such a probability while in the South region, that increase is of 3.6 p.p.. Such a fact, likely, is recurrent from the greatest insertion of the female into the job market as well as from the greater acceptance of the society of her role.

In the Central-West region, from among the individuals employed in 2008, 41% corresponded to females, while in the South of the country, that percent was of 43%. The situation becomes worse when surveying in which income ranges are situated the female workers of each region. In the Central-West region, for example, 46% of the females employed stated to receive up to one minimum wage (in 2008), while in the South, 38% did so.

The ethnic issue, discussed from the variable *Black*, indicated that being of the black color decreases the probability for the individual to present a very good health status. Nicolella et al. (2008) presented a similar result – being a white increases the probability of having a good health status due to the closeness to hospitals, since they dwell in neighborhoods with more access to health. In general, the marginal effects were not statistically significant, except for the country as a whole and for the Southeast and Central-West regions, though weakly significant. For Brazil, the fact of being a black decreases by 0.7 p.p. the changes for having health status considered very good and, respectively, for the former and latter region, such a decrease is of the order of 1.0 and 1.4 p.p.

Living in urban or rural as a determinant of the health status only was significant for the Northeast and South regions. It is noteworthy to stand out that for the South region, the parameter was weakly significant at 10%. The results pointed out distinct impacts. For the first region, the fact for the individual to be situated in the urban area decreases by 2.2 p.p. the chances of presenting very good health status, while in the south region, there is an increase of 1.8 p.p. Nicolella et al. (2008) also did not find any significance in the distinction in the dichotomy urban/rural when the models with those dummies variables were estimated. On the other hand, Giuffrida et al. (2009) argued that living in the urban area increases the access to medical care and, therefore, they expected and found a positive relationship with health status. Therefore, for the South region, that variable is only weakly significant, its result is in agreement with that of Giuffrida et al. (2009).

The interpretation of the results discussed up to now and of the already existing literature points out that the implementation of a public policy, which delays the children's entrance to job market would be interesting. An initial strategy for minimization of the problem could occur via intensification in the inspection of the Family Allowance Program. So, an increase would occur in the probability for the individual to present a better health status coming from the delay in the entrance to job market as well as an increase in schooling level.

Besides, the Child Labor Eradication Program (PETI), also implemented by the federal government, which involves the state and local spheres and which seeks to decrease the participation of the children in job market from the income transfer, would also act as a mitigation mechanisms of child labor.

5. Conclusion

The objective of the work was that of surveying the negative impact of child labor upon the health status of the grown-up. The descriptive survey of the data founded in a successful manner on the interpretation of the results from the use of the econometric models.

In general, it follows that child labor decreases the probability for the individual to present a good health status when grown up, but that the age in which the child is inserted into job market is also important in the determining of health status. So, though one cannot fight in a definitive way child labor, for matters which goes beyond the scope of this paper, a policy of delay of the entrance of the child to job market would be important.

Furthermore, the results pointed out that the greatest educational level as well as of *per capita income*, affect positively the probability of having a better health status. The regional results pointed out that homogeneous policies will not obtain homogeneous results. This took place because the early entrance to job market as well as other variables affect, in a distinct way, the health status of the individual.

The utilization of the year 2008 only, instead of recurring to the cohort technique, stands out itself as a limitation of the paper. In addition, the endogeneity problem was not taken into account in the models estimated. The subjective character of the variable which measures the health status of the individual can also be dealt as another limitation of paper. For future research, the joint carrying out of that study with the estimate of the earnings equation relating the current health status with earnings level is suggested.

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Anita Goltnik Urnaut¹

EDUCATION FOR SUCCESSFUL INTERCULTURAL COMMUNICATION AND CULTURAL INTELLIGENCE

Abstract

Intercultural intelligence is the capability to function effectively in culturally diverse settings and consists of different dimensions (metacognitive, cognitive, motivational and behavioural) which are correlated to effectiveness in global environment (cultural judgment and decision making, cultural adaptation and task performance in culturally diverse settings). The purpose of the article was to check the relationship between knowledge and experiences of intercultural communication and the score of cultural intelligence. The sample consists of 107 students from Faculty for commercial and business science Celje; they answered the questionnaire of education on Intercultural communication and the Cultural intelligence scale (Ang, Dyne and Koh, 2006). The results show that the number of intercultural knowledge sources, number of foreign languages knowledge, frequency of communication with persons from other cultures in private and business time and frequency of international travels correlate significantly with the score of Cultural intelligence scale and its dimensions.

Keywords

Cultural adaptation, Cultural intelligence, Experience in intercultural communication, Increasing cultural intelligence, Intercultural Education

1. Introduction

The competence for successful intercultural communication in global world is becoming increasingly important. Globalization has made the world seem smaller, our awareness of cultural diversity is rising and the need for effective intercultural communication is present in most companies, project teams and with the management.

Each expatriate needs different abilities and competencies for successful work than employees who work in their own countries. In the selection process some specific criteria should be used for prediction of future success in global environment.

Globalisation touches the employees who work in their homecountry too, because the interaction and transaction with foreign companies today is almost inevitable.

Researchers tried to find personality factors which predispose people for successful live and work globally. Downes, Varner and Hemmasi (2010) focused on Big Five personality traits and found that extraversion (the amount of interaction with the external world, being with people, to be action-oriented), emotional stability (ability to cope with stress, not get upset

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easily, cope with unexpected situations...) and openness (creative, imaginative, curious, adventurous, awareness of their feelings) have a significant, positive impact on expatriate adjustment. Agreeableness (the ability to form social alliances) is significant and positively associated with expatriate job performance.

The most important factors which distinguish successful employees from less successful ones are knowledge, abilities and motivation.

The concept of Intelligence first referred to intellectual functioning; intelligence is defined as general cognitive problem - solving skills. It is a mental ability involved in reasoning, perceiving relationships and analogies, calculating and learning quickly.

First it was believed that there was one underlying general factor at the intelligence base (the g-factor). Gardner (1983, 1999) developed the Multiple Intelligence Theory which consisted of 8 primary intelligences: linguistic and logical-mathematical intelligence (valued in schools), musical, bodily-kinaesthetic and spatial intelligence (valued in the arts or sport), interpersonal and intrapersonal intelligence ('personal intelligences') and naturalist intelligence.

Legg and Hutter (2006) studied different definitions and summarized with: "Intelligence measures an agent's ability to achieve goals in a wide range of environments".

Mayer and Salovey (1990) introduced a concept of "emotional intelligence" (the ability to monitor one's own and other's feelings and emotions, to discriminate among them and to use this information to guide one's own thinking and actions), which became popular with Goleman's book *Emotional intelligence; why it can matter more than IQ* (1995). It was presented as an important factor of life and work success.

»Emotional intelligence is your ability to recognize and understand emotions in yourself and others, and your ability to use this awareness to manage your behaviour and relationship.« (Bradberry and Greves, 2009).

Researchers found Emotional intelligence an important factor of success and satisfaction at work, attitude toward work, the ability for effective team work, stress management, quality of work and life, mental health and also a factor of selection of human resources for different jobs.

Emotional intelligence is a part of social intelligence, which was first introduced by Thorndike (1920) as "the ability to understand and manage men and women, boys and girls – to act wisely in human relations". Goleman (2006) defines social intelligence as a social awareness and social facility (response and adaptation to others and the social situations).

Earley and Ang (2003) developed the construct of cultural intelligence, defined as »an individual's capability to function and manage effectively in culturally diverse settings; a multidimensional construct targeted at situations involving cross-cultural interactions arising from differences in race, ethnicity and nationality«.

Cultural intelligence comprises metacognitive, cognitive, motivational and behavioural dimensions. Metacognitive cultural intelligence includes mental processes which individuals use to acquire and understand cultural knowledge, cognitive cultural intelligence reflects knowledge of the norms, practices and conventions in different cultures acquired from education and personal experiences; motivational cultural intelligence reflects the capability to direct attention and energy toward learning about and functioning in situations characterized by cultural differences. Behavioural cultural intelligence reflects the capability to exhibit appropriate verbal and nonverbal actions when interacting with people from different cultures (Ang et al., 2007).

Cultural intelligence is related but distinct from other forms of non-academic intelligence (Ang, Dyne and Tan, 2003).

Some researches focused on factors that could improve intercultural encounters.

With studies of correlation between cultural intelligence and work outcomes Ang with co-authors (2007) found the relationships between the dimensions of cultural intelligence (metacognitive, cognitive, motivational and behavioural) and intercultural effectiveness (cultural judgment and decision making, cultural adaptation and task performance in culturally diverse settings). »Metacognitive and cognitive cultural intelligence predicted cultural judgment and decision making; motivational and behavioural cultural intelligence predicted cultural adaptation; and metacognitive and behavioural cultural intelligence predicted task performance. «

Rehg, Gundlach and Grigorian (2012) examined the influence of cross-cultural training on cultural intelligence and specific self-efficacy and found that cultural intelligence can be improved through training: training using a lecture format significantly improved average levels of cultural intelligence on the cognitive and behavioural dimensions, while it less significantly improved motivational dimension.

Successful intercultural communication is vital for organisations, their business success and global competitiveness. Organizations should consider candidate's personality as an important criterion for selection to work with business partners from other cultures and to work abroad. Cultural intelligence may be an essential element in the recruitment and retention process, due to correlation between cultural intelligence and job satisfaction and intent to renew contract (Sims, 2011) for international organisations as it has been shown to predict the cultural adaptability of people who find themselves in cross-cultural situations (Earley and Ang, 2003).

2. Aims of the paper and hypothesis

This paper aims to assess the relationship between cultural intelligence and cultural education, language knowledge and work experience and some organisational factors.

Hypothesis:

H 1: There are no differences in cultural intelligence scores according to gender, age and years of working experiences.

H 2: There is no correlation in scores on cultural intelligence scale and knowledge of foreign languages.

H 3: There are no differences in score on cultural intelligence scale according to the working place.

H4: There are no differences in score on cultural intelligence scale according to the some organisational factors (number of employees, number of foreign markets).

H5: Regression model shows no influence from educational independent variables (attendance in intercultural communication education, number of different ways to gather knowledge) on dependent variable (to cultural intelligence).

H6: There are no discriminant functions which distinguish more culturally intelligent student from less culturally intelligent ones.

3. Method

3.1. Participants

Data was collected from 107 part-time students of second Bologna level at Faculty for Commercial and Business Science Celje (study programs: commercial science, business informatics, tourism); 74 women and 33 men with average age 34,4 years who participated in the study.

3.2. Materials and data collection

Empirical method was used; data was collected with Culture intelligence scale (Ang, Dyne and Koh, 2006) and Survey about intercultural education and experiences.

All questionnaire items, originally published in English, were translated into Slovene; the students joining the subject Intercultural negotiation got written instructions and sent the completed questionnaires by e-mail.

4. Results

Cultural intelligence dimensions	N	Minimum	Maximum	Mean	Std. Deviation
Metacognitive	107	1,75	7,00	4,8902	1,30771
Behavioural	107	1,60	7,00	4,7570	1,19212
Cognitive	107	1,67	6,17	3,8240	0,97259
Motivational	107	1,40	7,00	5,2449	1,19221
Total score CQ	107	2,20	6,70	4,6350	0,95476

Table 1: Descriptive Statistics for Cultural intelligence dimensions

Students get the highest average score on motivational dimension (M=5,24, SD=1,19) and the lowest in cognitive dimension (M=3,82; SD=0,97). The average score of the whole scale is above the middle of the scale (M=4,63; SD=0,95).

Results in table 1 show that student have good metacognitive, behavioural and motivational cultural intelligence and average cognitive cultural intelligence. Compared to the results of Arg et al. (2007), the score does not differ much from the average of the USA students' sample; who score a little higher on metacognitive dimension (M=5,00, SD=0,93) and motivational dimension (M=5,35, SD=0,93) and are lower than our sample in behavioural dimension (M=4,18. SD=1,18) and cognitive dimension (M=3,67; SD=0,97).

The influence of the gender on cultural intelligence was tested with t-test, there were no statistically significant differences between men and women. The differences between the age groups and also between groups concerning years of working experience were tested with ANOVA, and no significant differences were found. Work experience is not correlated with cultural intelligence scores.

Results support the hypothesis 1: There are no differences in cultural intelligence score according to gender, age of respondents and years of working experiences.

Cultural intelligence dimensions	Working place	N	Mean	Std. Deviation	F	Sig
Metacognitive	intercultural communication	6	5,7500	1,03682	1,544	0,218
	management	24	4,9688	1,37784		
	others	77	4,7987	1,29272		
	Total	107	4,8902	1,30771		
Behavioural	intercultural communication	6	5,7000	0,68993	2,185	0,118
	management	24	4,8167	1,41902		
	others	77	4,6649	1,12317		
	Total	107	4,7570	1,19212		
Cognitive	intercultural communication	6	4,6944	1,00784	3,406	0,037
	management	24	3,9792	0,96348		
	others	77	3,7078	0,94364		
	Total	107	3,8240	0,97259		
Motivational	intercultural communication	6	6,2333	0,52789	3,240	0,043
	management	24	5,4750	1,28782		
	others	77	5,0961	1,16013		
	Total	107	5,2449	1,19221		
Total score	intercultural communication	6	5,5583	0,69528	3,564	0,032
	management	24	4,7375	0,98469		
	others	77	4,5312	0,92984		
	Total	107	4,6350	0,95476		

Table 2: F-test of differences according to working place in Cultural intelligence dimensions

We divided the respondents in three groups, according to their working place; part-time students who have a job with intensive intercultural communication, managers and others. Scores of the cognitive, motivational and total score are significantly different, depending on working place. Results in table 2 do not support the hypothesis H2: There are no differences in scores on cultural intelligence scale according to the working place.

Cultural intelligence dimensions	Number of languages spoken	N	Mean	Std. Deviation	F	Sig
Metacognitive	1,00	40	4,5438	1,21012	4,090	0,020
	2,00	37	4,8378	1,43761		
	3,00 or more	30	5,4167	1,12252		
	Total	107	4,8902	1,30771		
Behavioural	1,00	40	4,3350	1,30827	5,242	0,007
	2,00	37	4,8378	1,23903		
	3,00 or more	30	5,2200	0,71506		

	Total	107	4,7570	1,19212		
Cognitive	1,00	40	3,6083	0,70261	6,454	0,002
	2,00	37	3,6396	1,08832		
	3,00 or more	30	4,3389	0,97033		
	Total	107	3,8240	0,97259		
Motivational	1,00	40	4,7900	1,20932	7,254	0,001
	2,00	37	5,2649	1,25968		
	3,00 or more	30	5,8267	0,78912		
	Total	107	5,2449	1,19221		
Total score	1,00	40	4,2725	0,82166	9,002	0,000
	2,00	37	4,5851	1,03949		
	3,00 or more	30	5,1800	0,76874		
	Total	107	4,6350	0,95476		

Table 3: ANOVA of differences according to number of foreign languages spoken in Cultural intelligence dimensions

Scores of the metacognitive, behavioural, cognitive, motivational dimension and total score are significantly different depending on knowledge of foreign languages. Students with the knowledge of 3 and more foreign languages score higher on all culture intelligence dimensions. Results in table 3 do not support the hypothesis H 3: There are no differences in scores on cultural intelligence scale according to the knowledge of foreign languages.

The correlation between organisational factors and cultural intelligence were not significant; results do not support the hypothesis H4: There are no differences in score on cultural intelligence scale according to some organisational factors (number of employees, number of foreign markets).

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	4,067	1,001		4,063	,000
Gender	,041	,178	,020	,232	,817
Age	-,018	,031	-,156	-,581	,562
Work experience in years	-,002	,026	-,024	-,089	,929
Frequency of international communication in private time	-,261	,091	-,312	-2,878	,005
Frequency of international communication in working time	-,118	,070	-,188	-1,680	,096
Frequency of international travels	,266	,122	,254	2,182	,032
Organisation – number of employees	-1,219E-6	,000	-,003	-,033	,974
Organisation – number of foreign markets	,000	,002	-,018	-,193	,847
Number of learning sources	,153	,048	,363	3,204	,002
Working place	,011	,086	,013	,130	,897
Number of foreign languages knowledge	,240	,112	,203	2,144	,035

Table 4: Regression analysis - Coefficients of factors influencing cultural intelligence (total score of CQ)

Regression analysis of factors influencing cultural intelligence showed that the multiple correlations between 11 independent variables and cultural intelligence are 0,619. With the variables included in the model we can explain around 40% cultural intelligence variance (square R is 0,383; F=5,301, Sig. 0,000). In table 4 we can see high value of Beta coefficient for variable Number of learning sources (0,363; persons who use more sources of knowledge have higher cultural intelligence), frequency of international communication in private time (-0,312; higher frequency of private conversation with the people from different nations is connected with higher cultural intelligence (frequency scale: very often=1, not at all 5), frequency of international business travels (0,254; lower frequency of international travel connected with work is connected with higher cultural intelligence (frequency scale: very often=1, not at all 5) and the number of foreign languages knowledge (0,203).

The Regression analysis of factors influencing specific dimensions of cultural intelligence showed some significant correlations:

- Metacognitive dimension is explained with number of learning sources (Beta=0,278, t=2,181, Sig.=0,032);
- Behavioural dimension with number of learning sources (Beta=0,289; t=2,333, Sig.=0,022), frequency of international communication in private time (Beta=-0,236; t=-1,989, Sig.=0,050) and frequency of international business travels (Beta=0,263, t=2,062, Sig.=0,042);
- Cognitive dimension of cultural intelligence with Number of learning sources (Beta=0,301, t=2,528, Sig.= 0,013) and frequency of international communication in private time (Beta=-0,277, t=-2,432, Sig.=0,017);
- Motivational dimension of cultural intelligence with Number of learning sources (Beta=0,291, t=2,458, Sig.=0,016), frequency of international communication in private time ((Beta=0,313, t=2,755, Sig.= 0,007) and frequency of international travels (Beta=0,268, t=2,202, Sig.= 0,030), number of foreign languages knowledge (Beta=0,196, t=1,979, Sig.=0,051).

Results of regression analysis do not support the hypothesis H5: Regression model shows no influence from educational independent variables (attendance in intercultural communication education, number of different ways to gather knowledge) on dependent variable (cultural intelligence). There are some factors influencing total score: number of learning sources, frequency of international communication in private time, frequency of international travels and number of foreign languages knowledge.

Independent variables	1 N=15		2 N=73		3 N=19	
	Mean	Std.deviation	Mean	Std.deviation	Mean	Std.deviation
Work experience in years	13,87	11,01	9,80	9,08	15,42	9,73
Frequency of international communication in private time	3,47	1,06	2,78	1,07	1,84	0,90
Frequency of international communication in working time	3,40	1,64	2,58	1,44	1,58	1,22
Frequency of international travels	4,47	0,92	4,16	0,83	3,47	1,17
Number of learning sources	2,33	1,18	3,27	1,76	6,33	2,77
Organisation – number of employees	250,07	423,27	928,08	2438,33	818,84	1849,35
Organisation – number of foreign markets	0,73	2,09	19,51	52,68	11,74	16,28
Age	36,40	8,02	33,15	7,81	37,84	9,08
Number of foreign languages knowledge	1,47	0,52	1,88	0,82	2,42	0,69

Table 5: Differences between more and less culturally intelligent students

Students were divided into 3 groups according to their score on cultural intelligence scale; (AS=4,64, SD=0,955; group 1: less than 3,68; group 2: 3,68-5,59; group 3: more than 5,60).

Function	Eigenvalue	% of Variance	Cumulative %	Canonical Correlation	Wilks' Lambda	Chi-square	df	Sig.
1	,618 ^a	86,0	86,0	,618	,562	57,116	18	,000
2	,100 ^a	14,0	100,0	,302	,909	9,479	8	,304

Table 6: Summary of Canonical Discriminant Functions

Discriminant analysis eliminated 1 discriminant function which divides individuals who have high, moderate and low cultural intelligence (table 6).

Independent variables	Correlation Function 1
Number of learning sources	,841*
Frequency of international communication in private time	-,567*
Number of foreign languages knowledge	,465*
Frequency of international communication in working time	-,441*
Frequency of international business travels	-,365*
Work experience in years	,159
Age	,155
Organisation – number of foreign markets	,033
Organisation – number of employees	,063

Table 7: Structure matrix

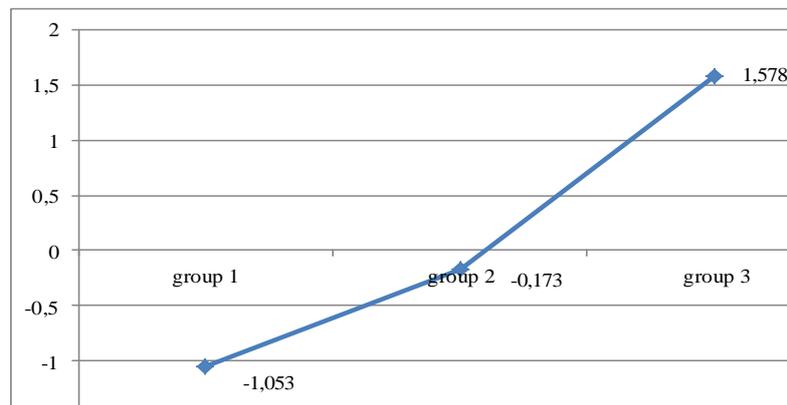


Chart 1: Unstandardized canonical discriminant functions evaluated at group means

Results do not support the hypothesis H6: There are no discriminant functions which distinguish more culturally intelligent students from less culturally intelligent students. The discriminant function shows the difference variables: number of learning sources, frequency of international communication in private time, number of foreign languages knowledge, frequency of international communication in working time, frequency of international business travels.

5. Discussion of results

Researchers have begun to study new concepts of practical intelligence to find the answer to the question why some individuals perform better than others in situations which involve interaction with people from different cultural background. Cultural intelligence was conceived in the new century, when we have experienced a great expansion of globalization. Effectiveness in global environment is vital for a great number of organisations, which need leaders and employees who are capable of understanding, functioning, and managing in the global environment. They can bring the organisations a competitive advantage (Ang and Inkpen, 2008).

In the study, whose main aim was to assess the relationship between cultural intelligence and cultural education, language knowledge, work experience and some organisational factors, we measured the cultural intelligence of the students, who listened to the subjects Intercultural negotiation and Intercultural communication at second Bologna level. Their average score on the cultural intelligence scale was above the middle level of scale ($M=4,63$,

SD=0,95). Looking into the dimensions of cultural intelligence, we can see that the highest average score was in motivational dimension and the lowest in cognitive dimension. Only some students have work-experience in multicultural environment, and therefore their knowledge about rules in other cultures is limited. Metacognitive and behavioural cultural intelligence are also above the middle of the 7 level scale.

Students have above average capability to direct attention and energy toward learning about and operating in culturally diverse situations. Results of our students are similar to results of other students and higher than in employees involved in different studies conducted by Ang et al. (2007).

There is no influence of the gender, age, years of work-experiences, size of the company and number of international markets on cultural intelligence.

The working place is an important factor of cultural intelligence. Cognitive and motivational dimension and total score of cultural intelligence are significantly different depending on working place. Part-time students who have a job with intensive intercultural communication score higher than managers. The lowest score was found for students, who have others workplaces or are unemployed.

Those results support the findings about possibility to increase cultural intelligence through learning (Ng, Dyne and Ang, 2009).

Knowledge of foreign languages is a significant factor of cultural intelligence. Students with the knowledge of 3 and more foreign languages score higher on all culture intelligence dimensions. Learning new languages can increase the abilities for successful working in global environment.

Variables number of learning sources, frequency of international communication in private time and number of foreign languages knowledge positively correlate with cultural intelligence and explain more than one third of cultural intelligence variance.

Practical implications following from these findings are: organisations should provide more different knowledge source, the more sources will an individual use the bigger increase in cultural intelligence can be anticipated.

The correlation with business international travel is nominally positive, but because the scale of frequency was negative (from more frequent to less frequent), the number of international business travels does not increase cultural intelligence. Closer look into the results shows that only 4 students have frequent work obligation abroad and more than 75% have rare or no such situations.

Practical implications following from these findings could be that organisations should stimulate employees for bigger involvement in language courses, gathering knowledge in different ways and gathering experience with private involvement in intercultural situations.

Discriminant analysis showed factors which distinguish more and less culturally intelligent individuals: the number of learning sources, frequency of international communication in private time, number of foreign languages knowledge, frequency of international communication in working time, frequency of international business travels.

The results of the study support the findings from researchers who found that international experiences can increase cultural intelligence (Ang, Dyne, Tan, 2003) and supplement the range of organizational interventions for enhancing global leadership effectiveness which range from didactic programs to intensive cultural experiences (Caligiuri, 2006) with the promising positive influences of different experiences of communication with people from different cultures and the ability to converse in a different language. Crowne (2008) showed that number of countries visited correlates with cultural intelligence, presented study shows that also frequency of communication with other cultures correlates with cultural intelligence.

6. Conclusion

Cultural intelligence is a new construct that has no extensive attendance in Slovenia yet; the study advances the research on cultural intelligence with some new variables concerning educational factors and experiences.

The findings of this research identified a number of different ways of gathering knowledge as important possibility to enhance cultural intelligence and consequently success in global environment.

Important factors of cultural intelligence are, beside the number of intercultural knowledge sources, also the number of foreign languages knowledge, frequency of communication with persons from other cultures in private and business time and frequency of international travels which correlate significantly with the score of Cultural intelligence scale and its dimensions.

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Hacer Simay Karaalp¹

**THE EFFECT OF PUBLIC INVESTMENT AND FIRM-BASED INVESTMENT INCENTIVES ON
EMPLOYMENT:
A PANEL DATA ANALYSIS FOR TURKEY**

Abstract

This paper investigates the effects of two public policies, public investments and the firm-based investment incentives within the context of Law No. 5084, which considers the support of employers' social security premium payments on the private sector employment at the NUTS 3 regional level (81 provinces) of Turkey for the period of 2002-2011. To the best of the author's knowledge, there appears to be no empirical study that deals with the effectiveness of both public investment and the investment incentive within the context of Law No. 5084 on employment at the regional level. The results indicate that both public investments and incentive investment have a positive impact on employment. Moreover, the estimation results show that provinces where firm-based incentive investment was applied within the context of Law No. 5084 indicate a significantly better effect on employment in the following year. However, during the interpretation of the analysis one should also take into account the faults of the implementation. On the other hand, public investment for infrastructure and education also affected employment positively.

Keywords

Employment, Firm-based investment, Public investment

1. Introduction

Although the effectiveness and the success of the public policies on private sector performance have been discussed since the earlier regional development policies, they still preserve their prominence in the development process of countries, especially to stimulate economic activities in the lagged regions and thus to attract investment, government support for firms' production and investment costs by applying public policies. Therefore, firms' competitiveness and the scale of new investments will increase and new employment opportunities will be revealed.

Turkey, which is an emerging economy, has been struggling with regional and local economic development problems like many other developed and developing countries. One of the main problems in Turkey is the unbalanced economic development between eastern and western regions of the country. Since the inception of the Turkish Republic and with the initiation of the planned period since the 1960s, different regional development policies have been implemented in order to induce investment, to create jobs and to increase growth in low income regions to equalise interregional per capita income. While, in the period of etatism, the main attempts were towards the redistribution of public services and

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industrial investment to different parts of the country in order to develop a national economy, since the planned period regional development policies have focused on the growth centres. After the 1980s, following the rise of endogenous development theories in regional economy, the incentives for enhancing local potentials in priority regions for development (PRD) was applied in the regional policy of Turkey (http://research.sabanciuniv.edu/8875/1/MILESTONES_OF_REGIONAL_POLICY_IN_TURKEY.doc). In the 1990's, in parallel with the rise of the new regionalism approach, the effect of active regional policies in general and the necessity of public intervention gained importance (Karaçay-Çakmak and Erden, 2004; Pirili, 2011). In this context, during the last decades of the 20th century, Turkey's attempts to adopt the regional policy criteria of the EU in order to harmonise its legislation and the effect of public policies in regional economic development also became important in Turkey. Within this framework, Law No. 5084 enacted in 2004 comprises of the incentive for regional investment and employment as the most comprehensive and the most recent regulation for 49 provinces.

Investigating the impact of public policies, in this context public investment and incentives, together or separately on output and employment has been an issue for limited empirical studies dealing with the national and regional levels of Turkey in recent years (see Kaynar, 2001; Karaçay-Çakmak and Erden, 2004; Ay, 2005; Erden and Karaçay-Çakmak, 2005; Akan and Arslan, 2008; Özkök, 2009; Eser, 2011; Yavan, 2011). The results of these studies generally point to the positive effects of investment incentives on output and employment. However, some studies found no clear evidence of the positive effect of investment incentives (see for instance Karaçay-Çakmak and Erden, 2004; Erden and Karaçay-Çakmak, 2005; Eser, 2011). Eser (2011) concluded that, although the effect of investment incentives with Law No. 5084 increased employment in the less developed regions, due to problems arising from the structure of investment incentives they were sometimes inefficient in directing the investments in terms of regions and sectors. On the other hand, most of the limited number of empirical studies analysed the impact of public investments on income with the national and regional levels (see Karadağ, Önder and Deliktaş, 2004; Yıldırım, 2005; Deliktaş, Önder and Karadağ, 2009; Önder, Deliktaş and Karadağ, 2010). According to the findings of these studies, public investment is an effective policy tool for increasing regional income and reducing regional disparities.

Therefore, the main aim of this paper is to analyse the effects of two public policies, public investments and the firm-based investment incentives within the context of Law No. 5084, which considers the support of employers' social security premium payments on the private sector employment at the NUTS 3 regional level (81 provinces) of Turkey for the period of 2002-2011. To the best of the author's knowledge, there appears to be no empirical study that deals with the effectiveness of both public investment and the investment incentive within the context of Law No. 5084 on employment at the regional level. In this respect, the present study is the first attempt to investigate the effects of both public investments and the incentive investment on employment by using panel data analysis.

The remainder of this paper is organised as follows. Section 2 provides basic information about the regional development theories. Section 3 gives brief information about public investments and the investment incentives in the regional development of Turkey. The methodology and the data set employed in the study are presented in Section 4. The panel

data estimation results are given in Section 5. The paper concludes with a summary analysis of the findings in Section 6.

2. The regional development policies

The regional disparity which is the economic and social opportunity gap among regions has been one of the most important issues in terms of economic and regional development in all countries since the industrial revolution. During the development efforts of countries, while some regions stand out among others and attract capital, investment and population, some regions lag behind. Since regional disparities threatened the economic development of countries, finding a solution became necessary for all countries. First of all, there was an attempt to explain regional disparities in terms of economic, historical, geographical, social and cultural factors. However, due to insufficient explanation of these factors, the need for new approaches emerged.

The method of solving regional disparities differs according to the dominant economic approach in the world economy. Although many differences, controversies, conflicts and renewable theories could be observed from the 1930's to the mid-1970's, the common aim of all approaches was to emphasise the necessity of implementation of active public intervention to eliminate income inequalities and to boost economic and regional development. During this period, due to the hegemony of Keynesian economics, the widespread solution of inequalities was based on government intervention and planned development (Karaçay-Çakmak and Erden, 2004; Kadioğlu, 2007; Pirili, 2011).

However, at the end of the 1970's, traditional regional development approaches started to lose their hegemony. This was due to Keynesian economics having failed to find solutions for consecutive economic crises, and the globalisation trends which emerged with the rapid improvement of technology, which also affected regional development aspects. Secondly, the unsuccessful results of the traditional regional development policies for reducing the income gap between developed and developing countries and the regions in the 1950's and 60's weakened the fundamental basis of active and planned regional policies. Moreover, countries could not afford to finance regional planning policies due to economic crises. Therefore, the Keynesian approach, government intervention in economic development and thus the implementation of public investments and incentives were abandoned, and the Neo-Classical economic policies which advocated the shrinking of government in every field of the economy were revived. In this context, the subjects of economic stabilisation, deregulation, privatisation and economic efficiency started to be discussed. However, although the intensive use of regional planning, public investments and investment incentives decreased, they continued to be used (Karaçay-Çakmak and Erden, 2004; Pirili, 2011). At the end of the 1970's, with the effect of the Neo-Classical paradigm and globalisation, a new regional development approach started to arise. Instead of a government controlled development model, the new model - called 'endogenous regional development' - was based on regional or local entrepreneurship and self-developed mechanisms.

However, since the 1990's, the importance of regional development differences and the implementation of active regional policies in general and the necessity of public intervention have revived again. Following these developments, the reasons of emerging new aspect - called 'new regionalism' - can be classified as follows: especially since the mid-1990's, the local unit-based approach to regional or local entrepreneurship was not effective in less developed countries and regions due to limited resources and inadequate opportunities. The new regionalism and the new role of the government were also evaluated in the EU's regional development policies. Throughout the enlargement process of the EU, with the integration of less developed countries and regions, the significant income gap between regions started to threaten the economic and social integration of the EU. For this reason, and to reduce income disparities, the implementation of regional development policies and thus the need for public policies became important (Buton, 1998; Pirili, 2011). Under the framework of EU regional development policies, the EU adopted the obligation of using public funds to boost economic activities for private investment and entrepreneurship in less developed regions parallel with a new regionalism approach (Karaçay-Çakmak and Erden, 2004). Therefore, in the 1990's a new regional development approach was formed with the contribution of the 'new economic geography', which adopted the theoretical and technical propositions of the endogenous growth model to the spatial and regional level (Krugman, 1991a; Krugman, 1991b; Porter, 1990) and the Neo-Shumpeterian approach (see also Pirili, 2011).

Within this framework, the regions with efficient infrastructure and human capital and sufficient institutions contributing technological improvement and innovation would develop and grow more than other regions. Therefore, the importance of the government's contribution or the effect of public policies in regional economic development became important. In this context, this study focuses on the effectiveness of two significant public policy tools, public investments and investment incentives, in the economic development of regions and, therefore, in employment.

Public investments are one of the most preferred tools for governments to reduce disparities between regions and to boost economic development (Sturm, Jacobs and Groote, 1999). Public investments are composed of various types of physical investment, such as transportation, energy, water and social investments (human capital investments) such as health, education and services. In this context, the types and the geographic distribution of public investment projects are two of the most controversial issues in regional development.

Due to less developed regions lagging behind, they cannot boost economic activities by themselves with their limited resources. The main characteristic of the less developed regions is the low income level because of the lack of employment-creating economic activities. In this case, to improve the environment for entrepreneurship and to attract new investment into less developed regions, the government should apply some facilities and advantages to the entrepreneurs that prefer to invest in these regions. Therefore, public investments support the physical and social development of the regions and increase the attractiveness of the regions for investment. As a result, a region with adequate infrastructure, low cost energy and effective human capital will attract investments, increase economic activities and therefore create employment. Another significant tool used to reduce disparities among regions is investment incentives.

Investment incentives are another important regional development tool that has been used in many countries. As a public policy, investment incentives play a crucial role in boosting the economic activities in the less developed regions, as well as public investment. Incentive is the financial or non-financial support, aid or encouragement that is applied by the government with the aim of providing more and faster development of specific economic activities. One of the objectives of investment incentive policies is to implement specific incentive policies with a view to speeding up the development of economically and socially underdeveloped regions (Özaslan, Dinçer and Özgür, 2006). Incentives can be stated as grants in aid, subsidies, transfer expenditures to producers, premiums and supports (Kadioğlu, 2007). Without contradicting international obligations and in accordance with the foreseen targets of the development plans and annual programmes, incentive is the support and the lead of investments to eliminate regional disparities, to create employment, to use advanced, suitable and high value added technologies and to provide international competitiveness. The efficiency of incentive tools and the incentive implementations that are used to eliminate regional disparities can differ according to the development programmes and the economic and social characteristics of countries (Ildirar, 2004).

Incentives (classical incentives) can be classified according to three groups: financial incentives, tax incentives and indirect financial incentives. Financial incentives are grants, loans and loan guarantees and insurance provided by the government. The aim of the implementation of tax incentives is to increase investments and employment in less developed regions, and to support specific sectors and economic activities. The principal and most common tax incentives are tax holidays, accelerated depreciation implementation, investment allowances and tax credits, income and corporate tax reductions, indirect tax exemptions and free zones. In this context, by using these incentives, the plant location choice of entrepreneurships tries to be conducted to less developed regions. By providing these facilities, less developed regions try to become advantageous for starting a new business or decreasing production costs. Indirect financial incentives can be classified as regulatory incentives to improve environment, health, labour and safety standards, and to give education-based incentives for entrepreneurs regarding the infrastructure and pre-investment technical issues, giving priority to public procurement in some sectors or types of investment, protection against imports, and supporting investments that increase exports. In recent years, incentives have been used not only for investment, employment and exports but also to promote R&D and innovation in firms. Through the gaining importance of the development of the small- and medium-sized enterprises (SMEs) and the increase of competition with the support of new initiatives, the components of the incentives expanded to the 'new generation incentives', such as providing information and consultancy activities for SMEs, incubator centres, employment training, supporting R&D centres (Eser, 2011).

Both in the developed and developing countries the ultimate aim of public policies is economic development. In the developed countries, the public policies such as public investments and incentives are applied to develop the lagging regions, to decrease unemployment, to sustain technological improvement and to increase productivity in certain activities. But in the developing countries the importance and the need for public policies increases due to common economic problems such as high inflation, unemployment, high interest rates, increasing debt burden and inequality in income distribution (Özkök, 2009). In

the developing countries, public policies play a crucial role in reducing regional disparities, in creating employment, in stimulating the production of value added products, industrialisation, increasing international competitiveness and, therefore, the economic development of the country.

3. Regional development policies in Turkey

Turkey is composed of different regions with different economic, social and cultural characteristics. Thus, reducing the regional disparities between the regions of Turkey has been an important issue in terms of regional economic policies since the foundation of the Republic of Turkey. In this context, the regional development policies can be evaluated between two separate periods, before and after the 1990's (see also Eser, 2011).

The special importance and the aim of reducing development differences among regions has been attributed to the planned era. The elimination of the imbalance between regions has been one of the priority areas in all development plans devised (Özaslan, Dinçer and Özgür, 2006). From the first development plan (applied between 1963 and 1967) to 1999, development plans have been based on national development rather than regional development. Regional development was considered within the narrow scope of public development planning and evaluated within the framework of an integrated approach including physical, social and economic dimensions. With the initiation of the planned period since the 1960s, regional policy has been mainly shaped by development efforts focused on growth centres. Especially after the 1980's, following the rise of endogenous development theories in regional economy, the incentives for enhancing local potentials in PRD and supporting local entrepreneurship and local actors have assumed an important place in the regional policy of Turkey (http://research.sabanciuniv.edu/8875/1/MILESTONES_OF_REGIONAL_POLICY_IN_TURKEY.doc). Priority has been given to underdeveloped territories in the distribution of public investments in all plans and programmes. Through PRD policies the priority was given to the less developed east and south-east Anatolia regions and Black Sea regions. However, except the South-eastern Anatolia Project (SEAP), one the most important of these plans, other integrated regional development policies, could not achieve a considerable success. These precautions were not sufficient to eliminate regional differences, migration, and rapid population increase in large cities. The late 1990s and early 2000s, significant developments experienced for regional development incentives. Since the 1990's, Turkey has tried to develop its regional policy in compliance with EU regional policy, introducing structural reforms for reducing regional disparities in the country (http://research.sabanciuniv.edu/8875/1/MILESTONES_OF_REGIONAL_POLICY_IN_TURKEY.doc). Between these years, direct policies (such as to provide credit facilities) applied to the regions to continue the uncompleted investments in the less developed regions (with Law No. 96/8905 dated 07.11.1996) and with Law No. 4325 dated 23.01.1998 the PRD was identified and incentive policies were introduced for these areas. Also, with Law No. 99/12478 dated 26.02.1999, electrical energy support was provided for investments located in the less developed regions.

3.1. Law No. 5084

In recent years, to reduce regional disparities, incentive policies have become prominent. To speed up the investments and employment and to increase the contribution of the private sector to the regional development, new incentive policies started to be used in 2004. Law No. 5084, enacted in 2004, which comprises incentives for regional investment and employment, is the most comprehensive and the most recent regulation in Turkey (Eser, 2011). The aim of the law is to increase investment and employment in the less developed provinces by implementing tax and insurance premium incentives, giving energy support and providing free investment place allocation. Law No. 5084 comprises 49 provinces.

In the first version of Law No. 5084 in 2004, 36 provinces were selected according to the following criteria: The per capita GDP level was lower than 1,500US\$ in 2001 and provinces were evaluated in the PDAs. The private firms located in these provinces could benefit from the income tax being withheld from the wages of new personnel, treasury's contribution to the employers' social insurance payments, energy support and the investment place free of charge. In 2005, with Law No. 5350, 13 provinces whose social economic development index as determined by the State Planning Organisation (SPO) was found to be negative in 2003, were included in the scope of the classification. Moreover, with Law No. 5615, the Gökçeada and Bozcaada districts of Çanakkale were included within the scope of the incentives (<http://ekutup.dpt.gov.tr/plan/plan9.pdf>).

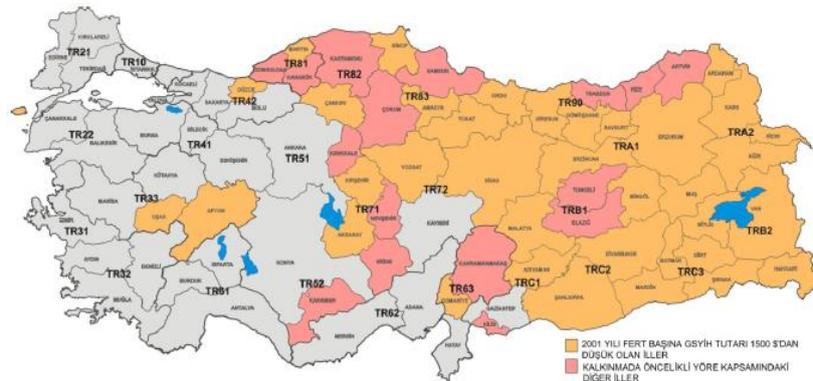


Figure 1: Provinces under the Law no 5084 (Eser, 2011)

According to Figure 1, except for Gaziantep, nearly all the provinces in east and south-east Anatolia were included in the scope of Law No. 5084. In the western part of Anatolia only Kütahya, Uşak, Afyon and Düzce and the Bozcaada ve Gökçeada districts of Çanakkale were included. In Figure 1, the significant development differences can be observed between the eastern and western parts of Turkey, therefore the aim of Law No. 5084 was to eliminate this disparity.

To this end, the incentives applied within the framework of Law No. 5084 comprise an income tax withholding incentive, employer's contributions in insurance premium incentive, free investment place allocation and energy support (<http://www.gib.gov.tr/index.php?id=820>). The investment incentive Law No. 5084 which is analysed in this study comprises social insurance payment of employers' contributions by

the treasury. According to the law, on the condition that firms locate in the determined provinces and provide all requirements, the treasury will contribute the total share of employers' social security premium payments if the private firms' located in the organised industrial zones, otherwise the treasury will contribute the 80% of the share of employers' social security premium payments if firms locate in other places. However, to cope with the latest financial crisis in 2008, the implementation of Law No. 5084 extended until 31.12.2012 for all incentives except energy support (http://uye.yaklasim.com/filezone/yaklasim/tummevzuat/sgk_genelgeleri/6408866.htm).

4. Empirical model and the data

This study tries to reveal the effectiveness of public investments and firm-based investment incentives on employment. Public investments comprise investments for infrastructure and education which can motivate private sector employment. The investment incentive is the incentive of social security premium payments to the private firms which locate in the less developed provinces of Turkey. Hence, a panel data analysis was used by employing data over 10 years.

In order to assess the quantitative analysis of the effects of the public policy instruments (public investments and the firm-based investment incentives) on regional employment for the period 2002- 2011, a simple panel regression can take the following form:

$$\text{LogEMP}_{it} = \beta_0 + \beta_2 \text{INVINC}_{it} + \beta_3 \text{LogEDU}_{it} + \beta_4 \text{LogINF}_{it} + \varepsilon_{it} \quad (1)$$

where LogEMP_{it} is the log of the number of compulsory insured persons in the private sector in province i at time t , INVINC_{it} is the dummy variable taking the value one if firm-based investment incentives are applied in province i at time t and otherwise zero. A significant positive value indicates that the firm-based investment incentive has a positive effect on regional/provincial employment. LogEDU_{it} is the log of the public investments for education in province i at time t , LogINF_{it} is the log of the public investments for infrastructure in province i at time t .

The annual data on employment, public investments for education and infrastructure and firm-based investment incentives data at provincial levels were employed for the aim of the study. The data set covers the time period of 2002–2011 for the NUTS 3 regional level (eighty one provinces) of Turkey. The total number of compulsory insured person in the private sector was used as a proxy for employment. The data was taken from the Social Security Institutions (SSI) for each province. The data for the public investments were taken from the SPO. Instead of using total public investment, public investments for education and infrastructure were included in the model to analyse the impact of specific public policy in stimulating regional employment creation. The infrastructural investments were found by the calculation of energy and transportation investments which are related to output growth and then employment creation in the provinces. The variables were converted into real values using various investment indices. Investment deflators were also obtained from the SPO for the entire period. All the variables are used in logarithmic forms in the study. In

order to analyse the effect of firm-based investment incentives within the context of Law No. 5084 a dummy variable was formed for a total of 49 provinces that takes a value of 1 for 36 provinces from 2004 to 2011 and for 13 provinces from 2005 to 2011 after the extension of the law in 2005.

5. Estimation results

The model (1) was estimated using the panel data regression with one-way fixed effects. Fixed-effect estimation is preferred because the analysis covers the overall provinces and accounts for time-invariant, unobservable heterogeneity among provinces. This choice also corresponded to the results of the F test, which is employed to determine whether to use the fixed-effect estimator or pooled ordinary least squares (OLS). The Hausman (1978) specification test also confirms the presence of fixed-effect model estimation (within estimator). A Hausman specification test shows that the individual effects and the explanatory variables are correlated, therefore indicating that a fixed effects model should be used since a random effects model would be biased (Krumm and Strotmann, 2012; Wooldridge, 2010). During the estimation process, an autocorrelation problem was detected. For this reason, to eliminate the autocorrelation problem, the AR (1) term was included in the equation estimation. The AR (1) term is found to be statistically significant, showing the series does not contain any unit root (Maddala and Wu, 1999; Choi, 2001; Levin, Lin and Chu, 2002). Table 1 summarises the fixed-effects estimation outcomes of the effects of investment incentives and public investments on employment in NUTS 3 regional level (provinces).

Dependent variable: <i>LogEMP</i>				
	Coefficient	Standard Error	t-Statistic	Prob.
<i>C</i>	4.2948	0.276	15.583	0.000*
<i>INVINC</i>	0.0657	0.016	4.004	0.000*
<i>LogINF</i>	0.0129	0.003	3.972	0.000*
<i>LogEDU</i>	0.0122	0.005	2.041	0.041**
<i>AR(1)</i>	0.9284	0.012	74.807	0.000*
R-squared	0.996	Mean dependent var.		8.925
Adjusted R-squared	0.996	S.D. dependent var.		6.606
S.E. of regression	0.191	Sum squared resid.		21.465
F-statistic	2157.88	Durbin-Watson stat.		1.969
Prob(F-statistic)	0.000			

Notes: * and ** denotes 1% and 5% levels respectively

Table 1: Estimation Results of the Fixed Effects Panel Data Model

The results in Table 1 suggest that, as expected, all the estimated coefficients that affect the employment in NUTS 3 regional level (81 provinces) of Turkey are positive and significant at the 1% and 5% levels of significance. Thus, the results suggest that both public investments and incentive investment have a positive impact on employment. Moreover, the estimation results show that provinces where firm-based incentive investment was applied within the context of Law No. 5084 indicate a significantly better effect on employment in the following year. In line with the expectation, the investment incentive which was given to private firms in the less developed provinces to support the share of employers' social security premium

payments is significantly effective on employment. Considering that the total number of compulsory insured persons in the private sector is a proxy for employment, this positive relationship is meaningful. Although the employment growth rate was higher in the provinces under the scope of Law No. 5084 than other provinces also stated in (Eser, 2011), it is important to consider that Law No. 5084 is a firm-based investment incentive and firms, under the condition of at least employing 10 employees and locating in the less developed provinces, can benefit from the insurance premium incentives. In this context, because the employment data that was used in this study comprises the total number of compulsory insured persons in the private sector, it is important to take notice of the increased number of insurance registered workers. Also, as stated in Eser (2011) and Turkish Employment Agency, it was found that some firms try to use Law No. 5084 illegally. To benefit from the advantages of the incentive, by employing at least 10 employees, some firms recorded employees that work informally or else, without working, some firms recorded their relatives to provide insurance facilities. For this reason, although during the interpretation of the analysis it is difficult to prove, it is important to take this special issue into consideration.

The second variable - public investment for infrastructure - is also positively related to employment. A sufficient infrastructure system in the region will attract private firms and individuals and then, by increasing production and employment, it will boost regional development. According to the new economic geography, transportation infrastructure is the basic factor which determines firms' location decisions and the scale of economic activities (Krugman, 1991a; Venables, 1996). Firms will agglomerate in the regions where low energy costs and transportation facilities are provided. Regions which provide lower energy costs will attract more investment and then create employment. To cope with global competitiveness, firms should consider low cost production, productivity and access to large markets (Demir and Sever, 2008). In this case, especially in the less developed countries, not only aiming to boost national development but also aiming to reduce regional disparities by providing a sufficient infrastructure system will attract private investment, create employment and increase development.

Another significant variable that has a positive impact on employment is public investment in education. Returns on investment in education based on human capital theory have been estimated since the late 1950's (Psacharopoulos and Patrinos, 2002). Human capital theory puts forward the concept that investments in education increase future productivity. In this context, public investments on education indirectly affect the private sector by increasing the productivity and the efficiency of labour and also contribute to the reduction of regional disparities. Educated, productive, skilful, capable of using high technology and highly qualified workers will affect the production, income and development of the regions and therefore countries. Especially in the less developed regions, through public investment on education, different individual opportunities to generate income will converge and boost the employment of labour.

6. Conclusion

In this study, the effect of public investments and investment incentives on the private sector employment at the NUTS 3 regional level (81 provinces) in Turkey was analysed.

Turkey, as a developing country with unbalanced economic development among its regions, uses various public policies such as public investments and investment incentives to reduce regional disparities and to boost private sector performance. Investment incentives and public investments can be considered important public policy tools explaining the spatial distribution of economic activity, and therefore of employment.

In this context, there are two significant public policy tools: public investments (infrastructure and education) which can motivate private sector employment and firm-based investment incentives which are insurance premium incentives applied to private firms which locate to the less developed provinces of Turkey. Within this framework, in the analysis, the implementation of Law No. 5084 which enacted in 2004 is taken into consideration. Law No. 5084 is the most comprehensive and the most recent regulation in Turkey and comprises the incentive of regional investment and employment. Therefore, the effectiveness of the investment incentives was analysed under the scope of Law No. 5084 which was applied in 49 less developed provinces. Thereby, the panel data analysis was used by employing data for the period of 2002-2011.

The results indicate that both public investments and incentive investment have a positive impact on employment. Moreover, the estimation results show that provinces where firm-based incentive investment was applied within the context of Law No. 5084 indicate a significantly better effect on employment in the following year. However, during the interpretation of the analysis one should also take into account the faults of the implementation. On the other hand, public investment for infrastructure and education also affected employment positively.

Moreover, the results of the study imply that the presence of public policies, public investments and investment incentives give rise to increase employment in less developed provinces. Although the implementation of investment incentives has been the most debatable issue in Turkey, investment incentives are found to be influential in the less developed provinces. It can be concluded that, provided they are monitored strictly, public investments and incentives could be directed towards less developed regions in order to create employment.

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Mohamed M. Mostafa¹

CITIZENS AS CONSUMERS: PROFILING E-GOVERNMENT SERVICES' USERS IN EGYPT VIA DATA MINING TECHNIQUES

Abstract

This study uses data mining techniques to examine the effect of various demographic, cognitive and psychographic factors on Egyptian citizens' use of e-government services. Multi-layer perceptron neural network (MLP), probabilistic neural network (PNN), classification and regression trees (CART), and multivariate adaptive regression splines (MARS) are compared to a standard statistical method (linear discriminant analysis (LDA)). The variable sets considered are sex, age, educational level, e-government services perceived usefulness, ease of use, compatibility, subjective norms, trust, civic mindedness, and attitudes. The study shows how it is possible to identify various dimensions of e-government services usage behavior by uncovering complex patterns in the dataset, and also shows the classification abilities of data mining techniques.

Keywords

Consumer profiling, Data mining, E-government services, Egypt, Neural networks

1. Introduction

One of the most intractable problems for anyone dealing with government is the sheer complexity of its organizational structure. For example, it has been estimated that the average government has between 50 and 70 different departments, agencies and regulatory bodies (Silcock, 2001). A number of government's different agencies may be involved in simple matters such as registering the birth of a child. In several countries there has been a growing pressure for governments to move online. In the Arab world, Dubai pioneered e-voting in elections for half the members of the United Arab Emirates' consultative assembly (The Economist, 2008). In Bahrain the e-government authority of Bahrain (E-GA) has recently launched the Enterprise Architecture Project initiative (EAP), which is considered to be the first of its kind in the Arab world. The initiative aims at streamlining government procedures by unifying the standards and procedures among all government entities in all matters related to information communication technology (Bahrain Tribune, 2009). Finally, in Egypt e-government currently provides 85 services to citizens including government forms, public policy information and tax filing (Hamed, 2008). Two main reasons are behind governments' decision to move online. First, a more enlightened view has begun in the ranks of government to treat the citizen like a consumer where transaction satisfaction is important. Second, pressures for governments to do more with less will force governments to provide services in a more efficient way. In fact, e-government offers substantial performance gains over the traditional model of government. For example, based on the analysis of 49

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empirical studies, Danziger and Andersen (2002) concluded that there were positive e-government impacts on data access and efficiency and productivity of government performance in both internal operations and external service functions. In fact it has been argued that a significant portion of the benefits created by e-government services are obtained by the government itself in terms of efficiency gains (Tung and Rieck, 2005). For example, the U.S. government generates around US\$ 3 billion on its Web site (Clark, 2003).

Profiling e-government services users is very important because the first step in planning the target marketing strategy is to segment the market and develop profiles of the resulting market segments. In fact, the usefulness of market segmentation hinges upon accurate profiling.

2. Literature review and hypotheses development

2.1. Perceived usefulness

The perceived benefit factor is closely related to perceived usefulness in the TAM theoretical model. Raman and Leckenby (1998) used the concept of utilitarianism to explain online behavior. They found a positive link between utilitarianism and duration of visit of web ads. This construct, too, seems to be closely related to perceived usefulness identified in TAM. Rogers (1995), in his diffusion of innovation paradigm, also posits that the perceived benefit or relative advantage of innovation positively influences adoption rate. In a meta-analysis in the innovation research literature, Tornatzky and Klein (1982) concluded that relative advantage was positively related to adoption. In a similar vein, King and He (2006), in a meta-analysis of the TAM, found a strong positive link between perceived usefulness and behavioral intention ($\beta = 0.505$). It follows that

H1: perceived usefulness of e-government services positively influences users' intention to use these services.

2.2. Perceived ease of use

Perceived ease of adoption can affect adoption behavior since an innovation that is easy to use can considerably reduce the time and effort required by the user and, thus, increase the likelihood of adopting the technology. Most studies on technology acceptance showed that perceived ease of use directly influenced attitude towards use (e.g., Ahn et al., 2004; Bruner and Kumar, 2005; Chen et al., 2002). King and He (2006), in a meta-analysis of the TAM, found a strong positive link between perceived ease of use and behavioral intention ($\beta = 0.186$). In a study of technology adoption in government agencies, Gilbert, Balestrini and Littleboy (2004) found a statistically significant association between perceived ease of use and attitude, indicating the important role of the ease of use in the formation of users' attitudes. It follows that

H2: perceived ease of use of e-government services positively influences users' intention to use these services.

2.3. Compatibility

Prior studies indicated that compatibility had strong direct impact on behavioral intention in areas such as using group support systems (Van Slyke et al., 2002), adopting new methodology for software development (Hardgrave et al., 2003) and using university smart card systems (Lee and Cheng, 2003). In a recent study of e-payment adoption in China, He et al. (2006) found that only compatibility has a significant effect on respondents' intention to adopt the system. Compatibility may also influence behavioral intention through performance expectancy and effort expectancy (Schaper and Pervan, 2007). For example, Lee and Cheng (2003) showed that compatibility of telemedicine technology exerted a significant effect on perceived usefulness. It follows that

H3: perceived compatibility of e-government services positively influences users' intention to use these services.

2.4. Subjective norms

Subjective norm (also called social norm) refers to users' perception of whether other important people perceive they should engage in the behavior (Schepers and Wetzels, 2007). While TAM does not include subjective norm, the theory of reasoned action (TRA) identifies attitudes and subjective norms as the sole determinants of behavioral intention (Fishbein and Ajzen, 1975). The theory of planned behavior (TPB), an update of TRA, also included subjective norms. Venkatesh and Davis (2000) acknowledged this and updated the TAM (TAM2) by integrating subjective norms. Several studies found a positive relationship between subjective norms and behavioral intention (e.g. Yi et al., 2006; Lu et al., 2009). In a study examining culture-specific enablers and impediments to the adoption and use of the Internet in the Arab world, Loch et al. (2003) found that both social norms and the degree of technological cultivation can impact the individual and organizational acceptance and use of the Internet. It follows that

H4: subjective norms positively influence users' intention to use e-government services.

2.5. Trust

Prior empirical research incorporated trust into TAM in several ways. For example Shih (2003) extended TAM by adding the perceived Web security construct and found that high perceived Web security directly increases consumer attitudes towards e-shopping. Results also support trust as an antecedent of usefulness (Pavlou, 2003), ease of use (Pavlou, 2003), attitude (Chen and Tan, 2004), and behavioral intention (Pavlou, 2003). Few studies explored the role of trust in e-government adoption. For example, Kim et al. (2008), found that trust in the organization using the technology and trust in government as responsible for the

introduction of electronic services are important determinants of e-government services adoption. It follows that

H5: trust in e-government systems positively influence users' intention to use e-government services.

2.6. Civic mindedness

The concept of civic mindedness is central to any analysis of e-government services adoption (Dermody and Hanmer-Lloyd, 2004). Civic mindedness encompasses three aspects: social contact, prior interest in government, and media use for public affairs (Dimitrova and Chen, 2006). As cyberdemocracy represents an extension of democracy into the realm of information technology and electronic communication, it is expected that the use of electronic means by citizens to interact with government to be an extension of their civic and political involvement via traditional channels (Katchanovski and La Porte, 2005). Prior research on e-government suggests that e-government users are similar to those who use government traditional services and are more engaged in civic affairs (Dimitrova and Chen, 2006). It follows that

H6: civic mindedness positively influences users' intention to use e-government services.

2.7. Attitudes

The social psychology literature on behavioral research has established attitudes as important predictors of behavior, behavioral intention, and explanatory factors of variants in individual behavior (Kotchen and Reiling, 2000). Attitude is defined as an individual's overall evaluation of performing a behavior (Lu et al., 2009). Prior e-services research has established a positive link between attitudes and behavioral intention (e.g., Aggelidis and Chatzoglou, 2009; Agarwal et al., 2000). It follows that

H7: attitude towards e-government services positively influences users' intention to use e-government services.

3. Method

3.1. Sample

The empirical study involved the administration of self-completion questionnaire to citizens in three Egyptian cities. Data were collected using the drop-off, pick-up method (Craig and Douglas, 1999). The effective sample size, thus, was 776 with a response rate of 52%.

3.2. Measures

All questionnaire items, originally published in English, were translated into Arabic using the back translation technique (Brislin, 1986).

4. Results

To compare e-government services users and non-users the traditional LDA was used using the SPSS 16.0 package. In order to assess the overall fit of the discriminant function classification results were examined. In combination, the discriminant function achieved 94.3% classification accuracy.

Given its usefulness in data mining (Smith and Gupta, 2000), MLP is a logical choice for the problem studied here. Following Lim and Kirikoshi (2005), a quasi-Newton algorithm with weight updates occurring after each epoch was used for MLP training. The learning rate was set at 0.1. After 100 iterations the correct classification rate (CCR) reached 99.8% as seen in Figure 1. As can be observed, the MLP classifier predicted training sample with 99.8% accuracy and validation sample with 98.3% accuracy.

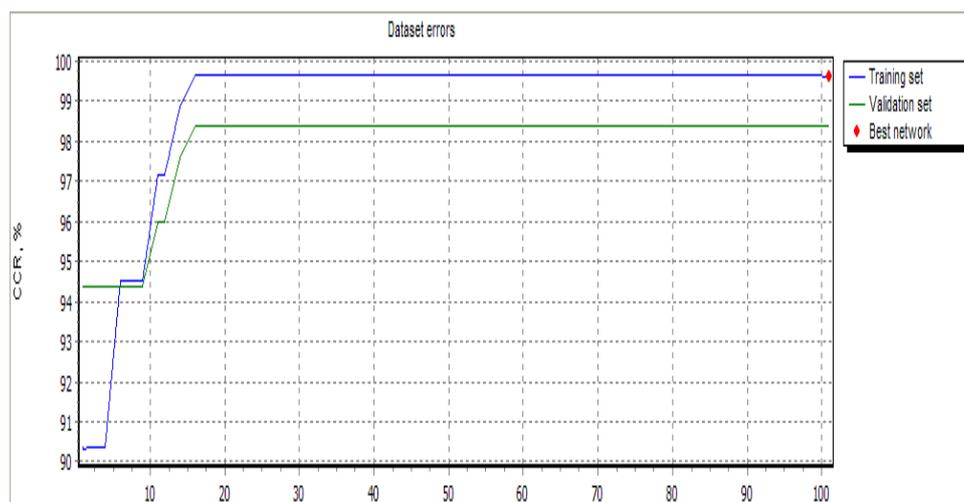


Figure 1: Correct classification rate (CCR) for the MLP neural network

The PNN classifier predicted both training and testing samples with 100% accuracy. CART is a nonparametric technique developed by Breiman et al. (1984) to classify group observations based on a set of characteristics into distinct groups, using the decision tree methodology. The technique was introduced to overcome the inherent limitations in the automatic interaction detector (AID) and the chi-square automatic interaction detector (CHAID) techniques. Unlike AID or CHAID, CART can work in classification tree mode with categorical predictor variables, or in regression tree mode with interval or ratio scaled predictors. CART recursively splits a dataset into non-overlapping subgroups based on the independent variables until splitting is no longer possible (Baker and Song, 2008).

Following D'Alisa et al. (2006), the 10-fold validation approach with re-substitution was adopted. This consists of simulating 10 different samples by subtracting randomly each time 10% of the subjects and duplicating randomly another 10%. After each run, the original

sample is restored. The final tree represents the best trade-off between variance explanation and variance stability across 10 "different" samples. Overall correct classification rate obtained from CART was 99.48%. Figure 2 depicts the final obtained pruned CART tree. From this figure we see that trust in e-government systems plays the most important role in rule induction.

MARS is a relatively novel data mining technique developed by Friedman (1991). This technique combines classical linear regression, mathematical construction of splines and binary recursive partitioning to produce a local model where the relationship between response and predictors are either linear or nonlinear through approximating the underlying function through a set of adaptive piecewise linear regression termed basis functions (BF) (Jesus and Angel, 2004). The power of MARS for building prediction and classification models has been demonstrated in many applications such as information technology productivity studies (Ko and Osei-Bryson, 2006), and genetics (York and Eaves, 2001). In this study we used MARS 2.0 package (Steinberg et al., 1999) to conduct the analysis. Overall correct classification rate obtained from MARS was 99.10% (sensitivity = 0.931 and specificity = 0.997).

5. Hypotheses testing

Group means for user and non-user groups on each of the independent variables used in the LDA were first calculated. Given the unequal group sizes of user versus non-user groups, group specific covariance matrices were used. Review of the significance levels of the individual attributes revealed that all the attributes except demographic variables displayed significant differences between the group means. Our results confirm previous studies which found e-government usage behavior to be correlated with perceived usefulness, ease of use, compatibility, trust, subjective norms and favorable attitudes to use the system (e.g. Helbig et al., 2009). For example Gilbert et al. (2004) found that trust is one of the strongest predictors of willingness to use e-government services.

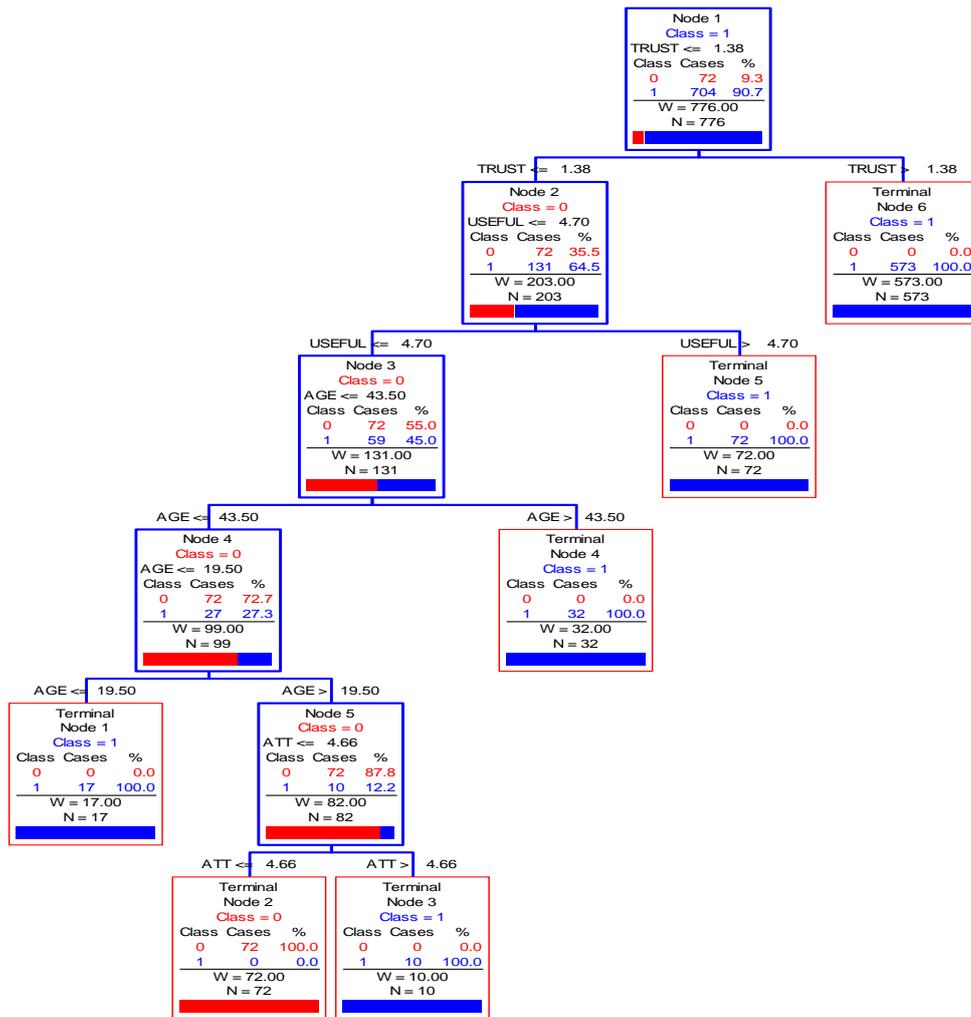


Figure 2: CART decision tree of e-government services' users

The finding that subjective norm is significant in predicting e-government services usage is consistent with Hofstede's (1991) cultural dimensions. In a high power distance collectivist culture such as Egypt one would expect significant others' opinions to have more impact on the individual because of face saving and group conformity, also a higher power distance would invoke a more influential role of peers.

It should be noted that we tested the research hypotheses using LDA as data mining techniques are of limited ability to statistically test and interpret hypotheses concerning the roles of specific variables that are included in the models as predictors. However, this limitation "should not be a serious drawback if one simply desires classification from the model" (Swicegood and Clark, 2001, p. 176).

6. Implications

The results of this study have several important implications for both theory and practice. From a theoretical perspective, the superior performance of data mining techniques found in this study confirms the theoretical work by Hecht-Nielson (1989) who has shown that

machine learning techniques, such as neural network models, can learn input-output relationships to the point of making perfect forecasts with the data on which the model is trained. However, perfect forecasts with the training data do not guarantee optimal forecasts with the testing data due to differences in the two data sets. Our results also corroborate the findings of other researchers who have investigated the performance of machine learning techniques compared to other traditional statistical techniques, such as regression analysis, discriminant analysis, and logistic regression. For example, in a study of clinical diagnosis of cancers, Shan et al. (2002) found a hit ratio of 85% for the PNN model compared to 80% for the LDA model. In a study of credit-scoring models used in commercial and consumer lending decisions. Trust was found to be one of the most important factors in determining e-government services usage. Because governmental agencies may be required by law to share information with other agencies, the need for trust in the maintenance of accurate citizen information will increase. Thus, a strategic aim could be to develop a trustworthy relationship with the public, giving assurances that their data will be secure, and that the information contained on the Web would be both current and accurate. This can be done through tools and techniques that Web developers can use to increase and promote the security of e-government Web sites, such as firewalls and encryption technology. Therefore, e-government services need to be user-friendly, and citizens need to have confidence in the system. In this process, the government need to be careful to protect its brand and credibility.

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MULTINOMIAL LOGISTIC ANALYSIS OF “SUSU” CONTRIBUTION IN GHANA

Abstract

The study employs cumulative multinomial logistic regression model to analyze “susu” (a micro-saving mechanism for collection of deposits that is common on the West African markets) contribution in Ghana. Evidence from the analysis of 1,630 contributors randomly sampled indicates that between male and female contributors, the former are more likely to contribute higher amounts than the latter. The paper, therefore, avers that “susu” institutions must target their marketing campaigns at income-earning males. Additionally, there is evidence to conclude that the number of years of contribution, the number of years a contributor has been in business, marital status and gender are predictors of ‘susu’ contribution in Ghana.

Keywords

Cedi, Contribution, Gender, Ghana, Marital Status, Microfinance, “Susu”

1. Introduction

Financial exclusion among the poor but productive group of the Ghanaian economy has been a debilitating conundrum taxing the intellectual energy of policy makers in Ghana. The rigmarole lending procedures of commercial banks in Ghana, including collateral caveat, have succeeded in pinning most of the poor but productive group of the population to the parameters of mediocrity, rendering stale their entrepreneurial ideas that could otherwise catalyze the developmental agenda of the country. However, proponents of the microfinance concept vociferously argue that it holds the potential to obliterate the financial exclusion headache of policy makers by making finance accessible to the poor but financially excluded at an affordable and convenient cost. Matin et al. (2002) contend that microfinance can be a strategically vital platform that the poor can use to raise their own prospects for an escape from poverty. Indeed, studies have amply demonstrated that microfinance plays three broad roles in development: It helps the very poor households to meet basic needs and protects them against risks; it improves household economic welfare; and it helps to empower women by supporting women's economic participation and so promotes gender equity (Asiama and Osei, 2007).

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Microfinance traces its roots to microcredit which was initially administered to the poor as a way of liberating them from the shackles of financial incarceration. After trying the microcredit concept for some time it became palpable that saving services—and not just loans—might help to improve wellbeing of the poor in general and of women in particular (Vonderlack and Schreiner, 2001). Microfinance institutions consist of organizations and agents that engage in relatively small financial transactions using specialized, character-based methodologies to serve low-income households, small farmers and others who lack access to the banking system. They may be informal, semi-formal (that is, legally registered but not under the central bank regulation), or formal financial intermediaries (Steel, 1998; referenced by Aryeetey, 2008).

The microfinance sector in Ghana comprises various types of institutions and these have been grouped into four (4) categories, namely: formal suppliers such as savings and loans companies, rural and community banks as well as some development and commercial banks; semi-formal suppliers such as credit unions, financial non-governmental Organizations (FNGOs), and cooperatives; informal suppliers such as susu collectors and clubs, rotating and accumulating savings and credit associations (ROSCAs and ASCAs), traders, moneylenders and other individuals; and public sector programmes that have developed financial and nonfinancial services for their clients (Asiama and Osei, 2007). One of the informal microfinance schemes which have been the financial refuge of the poor and the financially excluded in Ghana is the “susu” scheme. Much work has been done on its impact on small and medium scale enterprises (Alabi et al., 2007; Basu et al., 2004; World Bank, 2007). However, one of the murky areas that have not engaged the attention of researchers is the possibility of predicting the daily/weekly contribution. The current study, therefore, seeks to explore this virgin area of the microfinance literature by answering two main research questions:

- Between male and female “susu” contributors whom should “susu” institutions target?
- Are there some socio-economic factors that positively and significantly determine the amount of ‘susu’ contribution in Ghana?

The rest of the paper is organized into sections. The first section presents the description of the “susu” scheme in Ghana as a source of fund mobilization. This is followed by research methodology section. Presentation of the results and discussion section is next in line. The paper ends with conclusions and policy implications of the findings of the study.

2. The “susu” scheme in Ghana

The Ghana Co-operative “Susu” Collectors Association, (GCSCA) established in 1990, is the apex body superintending the operations of the “susu” scheme in Ghana. The association has identified the objectives of the “susu” scheme as follows: providing mobile savings

collection services for individuals and groups in urban and rural areas; providing appropriate financial intermediation for Micro/Small-scale Enterprises (MSEs) and Informal Sector Enterprises (IFEs) who cannot leave their wares; inculcating a savings habit among the rural and urban poor; providing an opportunity for financial intermediation between the formal banking sector and micro/small scale entrepreneurs; and providing individuals with self-employment opportunities as “Susu” collectors (The World Bank Group, 1999).

“Susu” as one of the microfinance schemes in Ghana is thought to have originated from Nigeria and spread to Ghana in the early twentieth century (Asiama and Osei, 2007). It is an informal financial identification for daily or weekly collection of deposits which is prevalent on the West African markets (Alabi et al., 2007). It can be described as a form of banking because it is a system of trading in money which involves regular and periodic collection of fixed amount of deposits that are made available to the owners after a specified period of time or when required or to borrowers within the scheme at a fee. Interest on deposits is almost non-existent (Aryeetey, 2008). Borrowing under the “susu” scheme does not require collateral; it relies on a guarantee system to reduce risks associated with ‘clean lending’ (Alabi et al., 2007). However, borrowing is short periods (Aryeetey, 2008). The essence of the “susu” scheme is to help contributors to protect their daily earnings from competing claims and ensure working capital to restock supplies at the end of the month.

In terms of collection of daily or weekly deposits, the scheme uses two main methods: independent/private (non-salaried) collectors and salaried/commissioned staff. Under the independent (non-salaried) collector’s method, the collector undertakes daily door-to-door collection of agreed fixed amount from clients for a cycle, usually one month. In each cycle the collector’s reward for rendering this service is a day’s deposit of each client. For example, if in each day a client contributes one Ghana cedi then at the end of the contribution cycle the collector will subtract one Ghana cedi from the contributor’s total deposit as service fee. In Ghana, it is now common to find that large numbers of individual “susu” collectors have established offices (kiosks) at various points in cities and towns where their clients can actually walk in to make deposits and engage in other transactions (Aryeetey, 2008). The major risk inherent in dealing with private collectors is the possibility of the collectors absconding with contributions. However, evidence suggests that the private collectors have been found to be more aggressive in reaching out to more potential savers since their profit is contingent on the number and per capita daily contribution of their clients. Under the salaried/commissioned staff deposit collection, the collecting agents are full-time employees of the microfinance institution (MFI) who undertake the door-to-door collection for and on behalf of the MFI for basic salary. This is the practice at most banks (CHORD, 2000). To provide customized service, most “susu” collectors begin mobilizing daily deposits around noon each day which provides the clients with an opportunity to transact business and earn some income before saving. This strategy offers

convenience for the rural and urban poor women whose income is too low to deposit large amounts of money with the formal banking institutions (The World Bank Group, 1999).

Basu et al. (2004) identify four different types of “susu” institutions that have influenced the operations of MFIs in Ghana. These are **“susu” collectors** who offer a saving vehicle by collecting daily amounts voluntarily saved by their clients, which they return at the end of the month, minus one day’s amount as a commission.; **“Susu” associations** which are either (i) rotating (ROSCAs), collecting savings from their members and allocating them to each member in turn, or (ii) accumulating associations, which allow regular contributions to be accumulated, to cover the lump sum costs of such special future events as funerals; **“Susu” clubs** which combine the modus operandi of susu collectors and susu associations operated by a single agent in which members commit to save a pre-defined amount over the medium-term (50- to 100-week cycles) and pay commissions on each payment and fees when they are advanced the targeted amount before the end of the cycle; and **“Susu” companies** which are more recent (late 1980s) and registered. In addition to savings collected using traditional “susu” collectors, “susu” companies provide loans after a minimum saving period.

Economically, the “susu” scheme is making immense contributions to the development and sustenance of micro and small enterprises (MSEs) in Ghana. In addition, the scheme is acclaimed to have the capability to swab excess liquidity through its savings mobilization methods. Consequently, the scheme is now being recognized and incorporated into some formal financial institutions as a deposit- loan system using “susu” collectors and operators (Basu et al.,2004). A number of MFIs in Ghana including rural banks and credit unions have incorporated the scheme into their deposit mobilization strategies.

According to the World Bank (1994) “susu” scheme is a major source of finance for most micro and small scale businesses. The scheme cuts across a wide range of socio-economic or occupational groups such as farmers, petty traders, artisans, food processors and salaried workers. For many petty traders, market women, apprentices and artisans, “susu” is alleged to be their trusted and reliable source of starting, sustaining and growing their businesses (Alabi et al., 2007). These groups are generally within the low income bracket and many of them are women (CHORD, 2000).

Evidence abounds that microfinance beneficiaries spend their income on domestic financial obligations. Johnston and Morduch (2008) find that low-income households often apply loans to household needs, including school fees, medical treatment, daily consumption needs, and social and holiday expenses. Female entrepreneurs tend to allocate a greater share of profits for family and child welfare, and that there is a strong relationship between female entrepreneurial activity and children’s welfare (Kessey, 2005). Women have a predisposition to use profits to meet family needs rather than to reinvest (Downing, 1990).

Evidence abounds that women have spend more of their income on their households; therefore, by helping women increase their incomes, you are improving the welfare of the whole family” (Cheston and Kuhn, 2002).

3. Research methodology

3.1. The Model

The cumulative multinomial logit regression model is utilized to relate the probability of a “susu” contributor contributing any of the five levels of contribution (five Ghana cedi contribution; four Ghana cedi contribution; three Ghana cedi contribution; two Ghana cedi contribution; and one Ghana cedi contribution) to socio-economic factors: number of years of contribution, years in business, gender and marital status. The cumulative multinomial logit model is expressed as follows:

$$Y = y_i \leftrightarrow \alpha_{i-1} < U \leq \alpha_i, i = 1, \dots, m \quad [1]$$

Where $-\infty = \alpha_0 < \alpha_1 < \dots < \alpha_m = \infty$. It is assumed that the latent variable U is determined by the explanatory variable vector X in the linear form $U = -\beta'x + \epsilon$ where β is a vector of regression coefficients and ϵ is a random variable with a distribution function F . It follows that

$$\Pr\{Y \leq y_i | x\} = F(\alpha_i + \beta'x) \quad [2]$$

Description of the variables used in the model has been presented in Table 1 below:

Description of variables

Variable	Description
Dummy for Contribution (dependent variable)	= 1: One Ghana cedi Contribution = 2: Two Ghana cedi Contribution = 3: Three Ghana cedi Contribution = 4: Four Ghana cedi Contribution = 5: Five Ghana cedi Contribution or higher
Dummy for gender (GENDER)	= 1: Female; =0: Male
Dummy for marital status (MSTATUS)	= 1: Married; =0: Otherwise
Years in business (YRSINBUS)	= Continuous variable
Number of years of contribution (CONTYRS)	= Continuous variable

5% significance level is assumed.

Table 1

The daily or weekly contribution of contributors is the predicted outcome and is measured at five levels: five Ghana cedi contribution; four Ghana cedi contribution; three Ghana cedi contribution; two Ghana cedi contribution; and one Ghana cedi contribution. The

hypothesized independent variables are years of contribution (YRSCONT); years in business (YRSINBUS); marital status (MSTATUS); and gender of respondents (GENDER). The variables MSTATUS and GENDER are dummy variables.

3.2. Data and Sampling

Data for the study were collected through a cross-sectional “susu” survey undertaken by the authors using questionnaire as the data collection instrument. A sample size of 1,630, comprising 697 male and 933 female contributors was used in the study. This sample size was arrived at after editing two thousand questionnaires for errors and inconsistencies. Thus, the successful response rate was approximately 82%. The sampling procedure employed was simple random sampling in which “susu” contributors at various market centres in Kumasi and Takoradi were interviewed. The decision to administer the questionnaire at market centres was informed by the literature. According to the World Bank Group (1999), market centers are locations with a large density of enterprises, especially those operated by women. The questionnaire was administered to respondents after they had indicated that they were “susu” contributors. The ‘susu’ scheme cuts across a wide range of socio-economic or occupational groups such as farmers, petty traders, artisans, food processors (CHORD, 2000). Thus, respondents in the survey were petty traders, artisans, food processors, retailers, and dealers.

4. Estimation results and discussion

The Pseudo R-square statistics reported in appendix A show 17.9%, 18.8% and 6.6% for Cox and Snell, Nagelkerke and McFadden statistics respectively. The model fitting information and the Likelihood Ratio Tests results shown in appendix A collectively rule out the joint hypothesis that “all coefficients of explanatory variables equal zero” and accentuate the robustness of our model.

As shown in Table 2, the number of years of contribution is statistically significant across three models. Evidently, the probability of a “susu” contributor in Ghana contributing one Ghana cedi or two Ghana cedis or three Ghana cedis relative to contributing five Ghana cedis decreases as the number of years of contribution increases by one year. No statistically significant relationship has been found between the number of years of contribution and four Ghana cedi contribution. It can, therefore, be contended that as the number of years of contribution increases a “susu” contributor in Ghana is likely to contribute five Ghana cedis or higher daily or weekly. This contribution behavior strikes a chord with the concept of logical incrementalism (Quinn, 1980). The benefits of the “susu” scheme may not be known at the commencement of contribution. Thus, to mitigate his or her risk the contributor

would attempt to experiment with smaller amounts and would gradually increase the daily contribution as he or she begins to experience the benefits of the scheme. Emblazoned across this logical incrementalist approach is risk consciousness among “susu” contributors in Ghana. Despite their low levels of education it appears that they appreciate the concept of risk in financial management which is commendable. It can be inferred from this finding that “susu” collection institutions in Ghana interested in increasing their turnover should target their marketing campaigns at existing contributors since they are more likely to increase their daily contributions than new contributors.

The number of years a contributor has been in business is statistically significant across two-Ghana-cedi contribution and three-Ghana-cedi contribution groups. The negative odds ratios indicate that the multinomial log-odds for a “susu” contributor to contribute two Ghana cedis or three Ghana cedis would decrease if a contributor were to stay in business for an additional year. In other words, as a “susu” contributor spends more years in business the probability that he or she will contribute five Ghana cedis is high. The number of years in business of the contributor is positively related to one Ghana cedi contribution, implying the log-odds of a “susu” contributor in Ghana preferring to contribute one Ghana cedi to contributing five Ghana cedis would be positive. However, this is statistically insignificant.

Marital status is statistically significant across one-Ghana-cedi and two-Ghana-cedi contribution groups but is statistically insignificant across three Ghana cedi and four Ghana cedi contribution groups. The negative relationship between marital status and one-Ghana-cedi contribution and two-Ghana-cedi contribution suggests to us that married “susu” contributors in Ghana are more likely to prefer contributing five Ghana cedis or higher than their unmarried (single) counterparts. One possible interpretation of this finding is that because married couples have both business and domestic obligations such as providing for the upkeep of their homes and paying children’s school fees they contribute more as insurance against these obligations (Alabi et al., 2007). The propensity for low-income households to spend their income on their domestic obligations has been established. Johnston and Morduch (2008) find that low-income households often apply loans to household needs, including school fees, medical treatment, daily consumption needs, and social and holiday expenses. This presupposes that “susu” institutions that desire to increase their daily turnover must target their marketing strategies at married prospects.

Gender is positive and statistically significant across one-Ghana-cedi contribution and two-Ghana-cedi contribution. It is, however, positive but statistically insignificant at three Ghana cedi contribution. Its relationship with four-Ghana-cedi contribution is negative and statistically insignificant. The multinomial logit for female contributors relative to male contributors would be 0.685 and 0.397 unit higher for preferring to contribute one Ghana cedi and two Ghana cedis respectively, given all other predictor variables in the two models are held constant. In other words, female contributors are more likely than their male

contributors to contribute one Ghana cedi or two Ghana cedis. One possible interpretation of this finding is the issue of the females meeting family obligations, making them unable to contribute more. This is because female entrepreneurs tend to allocate a greater share of profits for family and child welfare, and that there is a strong relationship between female entrepreneurial activity and children’s welfare (Kessey, 2005). Women have a predisposition to use profits to meet family needs rather than to reinvest (Downing, 1990). On the other hand, this finding may affirm income inequality between males and females in Ghana and reinforce the need for more poverty reduction interventions to be targeted at women, especially the uneducated or less educated but productive ones. Apart from enhancing the quality of family life in Ghana, empowering such women will also promote economic development.

Contribution day or		B	Std.	Wald	df	Sig	Exp(B)
One Ghana	Intercep	1.406	.236	35.64	1	.000	
	YRINBU	.006	.017	.125	1	.723	1.006
	CONTYR	-.823	.079	108.938	1	.000	.439
	[MSTATUS=0	.721	.184	15.36	1	.000	2.056
	[MSTATUS=1	0 ^a	.	.	0	.	.
	[SEX=0	-.685	.175	15.32	1	.000	.504
	[SEX=1	0 ^a	.	.	0	.	.
Two Ghana	Intercep	1.353	.195	47.92	1	.000	
	YRINBU	-.031	.013	5.45	1	.020	.969
	CONTYR	-.370	.057	41.88	1	.000	.691
	[MSTATUS=0	.451	.148	9.24	1	.002	1.570
	[MSTATUS=1	0 ^a	.	.	0	.	.
	[SEX=0	-.397	.137	8.41	1	.004	.673
	[SEX=1	0 ^a	.	.	0	.	.
Three Ghana	Intercep	.130	.251	.269	1	.604	
	YRINBU	-.044	.019	5.44	1	.020	.957
	CONTYR	-.205	.074	7.624	1	.006	.814
	[MSTATUS=0	-.069	.197	.124	1	.725	.933
	[MSTATUS=1	0 ^a	.	.	0	.	.
	[SEX=0	-.153	.176	.753	1	.385	.858
	[SEX=1	0 ^a	.	.	0	.	.
Four Ghana	Intercep	.	.307	22.072	1	.000	
	YRINBU	-.006	.016	.125	1	.723	.994
	CONTYR	.027	.080	.112	1	.738	1.027
	[MSTATUS=0	.341	.214	2.538	1	.111	1.406
	[MSTATUS=1	0 ^a	.	.	0	.	.
	[SEX=0	.222	.190	1.366	1	.242	1.248
	[SEX=1	0 ^a	.	.	0	.	.

a. This parameter is set to zero because it is redundant. The referent group is five Ghana cedi contribution.

Table 2: Multinomial Logistic Regression Analysis of “Susu” Contribution in Ghana

5. Conclusions and recommendations

The above results lend support to some conclusions about “susu” contribution behavior in Ghana. First, despite the financial and intellectual depravity of most “susu” contributors in Ghana they seem to have some appreciation for risk in financial management. This is evident in their apparent adoption of logical incrementalist approach to contribution, preferring to begin their contribution with smaller amounts before contributing larger amounts as years go by. Obviously, with little capacity-building support, these “susu” contributors who are engaged in micro, small and medium scale enterprises will be able to practice effective financial management in their businesses which will, in turn, promote economic growth in Ghana. Second, male contributors contribute higher amounts of money to the “susu” scheme than their female counterparts. One policy implication for “susu” operators in Ghana is that if they want to increase their profitability they should focus their marketing activities on male prospects. On the part of the Government of Ghana and other international organizations committed to bridging the income gap between males and females it appears that they are far from achieving their targets. The income inequality between males and females still persists in Ghana which calls for more concerted efforts at addressing it. Third, evidence proffered in this paper suggests that the amount of daily or weekly contribution of a “susu” contributor in Ghana is determined by the number of years of contribution, number of years in business, marital status and gender. The policy implication of this conclusion is that “susu” institutions that aspire to scale up their operations should rivet their interventions on these factors.

The authors recommend that more studies should be conducted for more insights into the current findings. The use of different dataset in Ghana will provide fresh perspectives to the findings of this study which will enrich the microfinance literature. The authors also recommend the application of the model to any of the countries in the West Africa sub-region where the “susu” scheme is practiced as this will provide international perspective on the current findings.

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THE CAUSALITY RELATIONSHIPS BETWEEN FDI AND R&D IN EUROPEAN UNION

Abstract

Technological development and R&D activities are accepted as one of the factors of basic production in endogenous growth theories. There has been an increasing interest towards R&D on the level of both firm and country. Moreover countries regard FDI as an important element which increase R&D activities. Although there are numerous studies which investigate relationship of both FDI and R&D on macroeconomic variables such as economic growth, employment and export; the number of studies which investigate the relationship between FDI and R&D is quite few. The aim of this study is to analyze relationships between FDI and R&D in the example of EU15 and EU27. For this aim, 1996–2009 period data of mentioned countries were considered and dynamic panel causality testing was done. According to the findings obtained from empirical test made in the study, there is one-way causality relationship among EU15 and EU 27 countries from FDI towards R&D. This finding points out to the existence of complementary relationship between FDI's and R&D for EU.

Keywords

European Union, FDI, Panel Causality, R&D

1. Introduction

Neoclassical growth theory which was developed under the leadership of Solow (1956) resulted in balanced growth. In the case of balanced growth, output per worker increases as much as technological development. Technological development which is accepted as exogenous in theory is a factor which determines increase in output per worker. However, in the endogenous growth theories which are developed under the leadership of Romer (1986), technological development is determined by intrasystem elements. The theory concluded that a growth rate could be achieved which is above balanced growth rate that was achieved by neoclassical theory. Technological development which is based on research

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and development (R&D) activities was regarded as an important factor in the increase of growth⁶.

Technology transfer may have positive effects on economic growth. Foreign direct investment (FDI) may increase economic growth through technology channels such as R&D by contributing to the current technological knowledge. Also, FDI investors may contribute to more efficient usage of resources by getting into competitive environment with domestic firms in domestic market. Domestic firms may carry out R&D activities in order to compete with technology brought by foreign investors. On the other hand, in some cases firms can have the new technology without doing any R&D activities.

Today countries make competition in order to attract FDI investments. Forming an economic integration or accession to an integration is conducted in order to attract FDI. EU which is the most successful example of integration is in an important position for FDI investments. The aim of this study is to analyze relationships between FDI and R&D for EU with panel causality testing. Literature which analyzed FDI and R&D relationship was included in the second section of study. In the third section, econometric method and data set was discussed. In the fourth section, findings obtained as a result of analysis were given. A general evaluation of findings was made in the last section.

2. Theory and literature summary

Although there are numerous studies which investigate relationship of both FDI and R&D on macroeconomic variables such as economic growth, production, efficiency, export, employment etc.; the number of studies which investigate the relationship between FDI and R&D is quite few. An exact judgment cannot be made about relationship between FDI and R&D according to the results of this restricted number of studies. While some of the studies assert that there is a positive, complementary relationship between these two variables; some studies assert that there is a negative, substitution relationship between these mentioned variables.

According to the studies which assert that there is a positive relationship between FDI and R&D, FDI creates positive externality on domestic firms through technological spillover effect. That is; foreign firms which enter in a country with FDI may have direct or indirect contribution to R&D activities of the host country. For example, foreign firms pay attention to increasing R&D activities of host country in order to adapt economic conditions of host country or to compete with domestic firms. Similarly, existence of foreign firms in the sector can force domestic firms to develop new innovations and increase their technological

⁶ See Romer (1990), Rivera-Batiz and Romer (1991a, 1991b), Grossmann and Helpman (1991), Aghion and Howitt (1992).

capacity. Moreover, foreign firms stepping into country can create technological spillover effects on behalf of domestic firms and cause increase in R&D activities of these firms (Sasidharan and Kathuria, 2011, p. 1226).

According to the studies which assert that there is a negative relationship between FDI and R&D, firms may choose to procure technology instead of doing R&D activities as a result of FDI inflow (Lee, 1996, p. 198). That is; domestic firms may decrease their R&D activities by procuring technology from abroad instead of competing with foreign firms. Sometimes firms stepping into foreign country prefer using technology of partner company and decide not to make R&D investment (Sasidharan and Kathuria, 2011, p. 1226). Then, FDI and R&D will become competitors instead of complements.

In the following section, specific studies which analyze relationships between FDI and R&D in literature were presented according to the year of analysis. Literature summary which is composed of these explanations is shown in Table 1.

Kumar (1987) analyzed relationship between technology import and R&D expenditures of 1334 firms in manufacturing industry in India for 1967–1977 and 1980–1981 periods with panel OLS method. According to the findings obtained from study, FDI inflows have reducing effect on domestic R&D expenditure.

Bertschek (1995) analyzed on 1270 German firms for 1984–1988 periods that import and FDI have no positive effect on innovative activities of domestic firms. In his analysis, Bertschek (1995) used Chamberlain's random effects probit approach (1984) and determined that import and FDI have positive effect on both product innovations and process innovations.

Lee (1996) analyzed relationship between technology import (as an indicator of FDI) and R&D in manufacturing industry firms in Korea for the year 1984 with the help of Heckman two-stage estimation procedure (1979). In the first stage of procedure he applies Probit analysis by using all the firms (492 firms) in the sample and determined that firms which import technology have tendency of increasing their R&D activities. In the second stage of analysis, panel OLS was applied on firms which have R&D institutes (92 firms) and it was determined that there is no complementary relationship between FDI and R&D, on the contrary FDI have negative effects on international inventive activities.

Chuang and Lin (1999) analyzed relationship between FDI and R&D with the help of Heckman two stage estimation procedure (1976) by using 8846 firms in Taiwan for the year 1991. Probit model estimation was done in the first stage of econometric analysis and it was determined that FDI has increasing effect on R&D activities. In the second stage panel OLS method was applied for 679 firms which make R&D investment. It was determined that there is negative relationship between FDI and R&D investments.

Branstetter (2000) analyzed changes in R&D activities of Japanese firms which make FDI investments in USA. In the study panel OLS was applied on 208 Japanese and 209 American firms for 1986–1989 period and it was determined that there is a positive but weak relationship between FDI and R&D activities.

Fan and Hu (2007) investigated effects of FDI on domestic R&D activities on 998 firms in China for 1998–2000 period. In the study in which Panel OLS and Fixed Effects Models were used as econometric method, it was concluded that FDI inflows have negative effect on R&D activities. Fan and Hu (2007) stated that firms with more foreign participation allocate less resource for R&D activities.

Kathuria (2008) investigated what kind of changes FDI inflow for domestic firms in India (high and medium technology industries) had on R&D expenditures. In the study in which post 1991 period when corporatization reform was done is divided into two sub-periods; Probit model was used in the first sub-period which covers the years 1994–1996. According to the findings obtained from estimation of Probit model it was determined that increase in FDI decreases R&D expenditures. Tobit model was used in the second sub-period which covers the years 1999–2001; it was concluded that there is no causality relationship between FDI inflow and R&D expenditures.

Like Kathuria (2008; referenced by Sasidharan and Kathuria, 2011) analyzed the relationship between FDI and R&D in India for post-corporatization period with the help of Heckman's two-stage estimation method (1979). In the study in which 1843 firms which go into operation in manufacturing industry sector for 1994–2005 period were analyzed, first of all panel OLS estimation was done without making discrimination among firms. According to the findings obtained from this estimation, it was determined that FDI has no significant effect on R&D. Similar results were obtained when panel OLS analysis was done by grouping firms as high, medium and low technology firms. Finally when firms were divided according to stock ownership (as majority and minority owned foreign firm) and analyzed in this way, it was determined that there is positive relationship between FDI and R&D.

Author	Period	Country	Method	Applied Findings
Kumar (1987)	1976–1977 1980–1981	India (1334 firms)	Panel OLS	FDI→R&D (-)
Bertschek (1995)	1984–1988	Germany (1270 firms)	Chamberlain's Random Effect Probit Model	FDI→Product innovations (+) FDI→ Process innovations (+)
Lee (1996)	1984	Korea (1. stage 492 firms, 2. stage 92 firms)	Heckman (1979)'s two stage estimation	FDI→R&D (-)
Chuang and Lin (1999)	1991	Taiwan (1. stage 8846 firms, 2. stage 679 firms)	Heckman (1976)'s two stage estimation	FDI→R&D (-)
Branstetter (2000)	1986–1989	Japan (208 firms) and USA (209 firms)	Panel OLS	FDI→R&D (+)
Fan and Hu (2007)	1998–2000	China (998 firms)	Panel OLS and Fixed Effect Model	FDI→R&D (-)
Kathuria (2008)	1994–1996 1999–2001	India (190 firms)	Probit and Tobit model Estimation	<ul style="list-style-type: none"> • Probit: FDI→R&D (-) • Tobit: FDI↔ R&D (0) • Full Sample: FDI↔ R&D (0)
Sasidharan and Kathuria (2011)	1994–2005	India (1843 firms)	Heckman (1979)'s two stage estimation	<ul style="list-style-type: none"> • Technology discrimination: FDI↔ R&D (0) • Majority- and minority-owned discrimination: FDI→R&D (+)

Note: Table was formed by authors; (+) reflects positive, (-) negative, (0) meaningless effects in the table, (↔) and (→) symbols respectively point out to the existence of two-way and one-way causality relationships between variables.

Table 1: Literature Summary about Relationship between FDI and R&D

3. Method and data

In the literature study it was seen that all the studies were based on data at firm level. Publishing of R&D data of countries in database recently and developments in econometric methods enables testing of relationship between FDI and R&D. Therefore, in this study panel data analyses which pay attention countries different from available literature was included.

In the study relationships between FDI and R&D was analyzed for EU 15 and EU 27 countries. As an indicator of R&D and FDI for mentioned country groups, shares of R&D expenditures and FDI in GDP were used respectively. The data were compiled from the World Bank's Development Indicators online database, available on <http://www.worldbank.org>. The panel covers annual data for the period 1996–2009. The data set of the study is unbalanced.

For determination of causality relationships between FDI and R&D in EU 15 and EU 27 countries, the method developed by Holtz-Eakin, Newey and Rosen (1988) was used. This method can be explained through a VAR system formulated as follows:

$$Y_{it} = \alpha_{0t} + \sum_{l=1}^m \alpha_{jt} Y_{it-l} + \sum_{l=1}^m \beta_{jt} X_{it-l} + \phi f_{yi} + u_{it} \quad (1)$$

$$X_{it} = \varphi_{0t} + \sum_{l=1}^m \varphi_{jt} X_{it-l} + \sum_{l=1}^m \mu_{jt} Y_{it-l} + \tau f_{xi} + \varepsilon_{it} \quad (i = 1, \dots, N; t = 1, \dots, T) \quad (2)$$

Here Y represents R&D; X denotes FDI; i is the number of the cross-section units from 1 to N; t is the time period from 1 to T; f_{yi} and f_{xi} refer to the time-invariant fixed effects unique to cross-section units. This fixed effects of cross-section units were eliminated by taking difference of the equations (1) and (2) so these equations were turned to equations (3) and (4) as follows⁷:

$$\Delta Y_{it} = \sum_{l=1}^m \alpha_j \Delta Y_{it-l} + \sum_{l=1}^m \beta_j \Delta X_{it-l} + \Delta u_{it} \quad (3)$$

$$\Delta X_{it} = \sum_{l=1}^m \varphi_j \Delta X_{it-l} + \sum_{l=1}^m \mu_j \Delta Y_{it-l} + \Delta \varepsilon_{it} \quad i = 1, \dots, N; t = 1, \dots, T; l = 1, 2 \quad (4)$$

Since error terms in equations (3) and (4) can be related with lags of dependent variable; instrumental variables should be used in the estimations. Therefore, the equations (3) and (4) were estimated by using the Generalized Method of Moment (GMM). The direction of causality in GMM estimations were determined by Wald statistics obtained by evanishing independent variables as a group.

On the other hand, it was decided with Sargan test whether instrumental variables used in GMM estimations are valid or not (Liang and Liang, 2009, p. 152).

4. Findings

Causality results were determined by Wald test for independent variables obtained from GMM estimation of equations (3) and (4) for EU 15 and EU 27 are presented in Table 2. On the other hand, the results of GMM estimation of equations (3) and (4) are given in the Appendix.

⁷ Δ represents difference operator.

	Equations	Wald Test χ^2 Statics	Sargan Test P-Value	Directions of Causality
EU 15	$\Delta R\&D_{it} = \sum_{l=1}^m \alpha_j \Delta R\&D_{it-l} + \sum_{l=1}^m \beta_j \Delta FDI_{it-l} + \Delta u_{it}$	6.62022 ^b	0.32090	FDI \Rightarrow R&D
	$\Delta FDI_{it} = \sum_{l=1}^m \alpha_j \Delta FDI_{it-l} + \sum_{l=1}^m \beta_j \Delta R\&D_{it-l} + \Delta \varepsilon_{it}$	3.29655	0.29297	FDI \nRightarrow R&D
EU 27	$\Delta R\&D_{it} = \sum_{l=1}^m \alpha_j \Delta R\&D_{it-l} + \sum_{l=1}^m \beta_j \Delta FDI_{it-l} + \Delta u_{it}$	7.81654 ^b	0.39797	FDI \Rightarrow R&D
	$\Delta FDI_{it} = \sum_{l=1}^m \alpha_j \Delta FDI_{it-l} + \sum_{l=1}^m \beta_j \Delta R\&D_{it-l} + \Delta \varepsilon_{it}$	2.70283	0.33244	FDI \nRightarrow R&D

Notes: b is meaningful at %5 significance level. Lags of dependent and independent variables were taken as 2 in the GMM estimations. Instrumental variables used in the GMM estimations are lags of level values of dependent and independent variables from 2 to 5. Δ represents difference operator.

Table 2: Results for Panel Causality Test

As it is seen in Table 2, Wald statistics is meaningful both for EU 15 and EU 27 in the estimations of the equations where R&D is dependent variable. This result points out one-way causality relationship from FDI to R&D. According to the estimation results presented in the appendix, the FDI coefficients have positive signs which means that FDI have positive effect on R&D. Small values of the coefficients can be interpreted as weak relationship. The coefficients of the estimations made for EU 15 being higher than EU 27 means that relationship is more powerful in the sense of EU 15. Moreover, significance levels of sargan test put forward that instrumental variables used in the GMM estimations are valid.

5. Concluding remarks

Endogenous growth theories have been put forward in 1980's. Technological development, R&D, human capital, background information and distribution have reached basic factors of production together with endogenous growth theories. Therefore, technological development and R&D activities becoming an important determinant in competitiveness of firms and growth of national economy resulted in increase of investments towards these in the level of both firm and country.

Increasing importance of R&D activities impelled countries towards different strategies for increasing R&D activities. In this sense, many countries regard FDI as an important factor which increases R&D activities. For example, FDIs may have important contributions to R&D activities in host country through technology transfer and spillover effects. Moreover, foreign firms which get into national economy with FDIs enable usage of resources more efficiently by increasing competitiveness environment in the country. Competitiveness which increases due to foreign firms impel domestic firms to carry out more R&D activities. FDI can

also have negative effects apart from positive ones which contribute to national economy and R&D activities. For example, domestic firms may not enter into competition with FDIs and prefer purchasing manufacturing technology and therefore cause national R&D investments to decrease. Similarly, foreign firms which make investments in the country prefer using technology of partner company and decide not to make R&D activities.

Liberalization of international capital mobility and globalization of financial markets in recent years resulted in increase of interest towards FDIs which are thought to have contribution in R&D activities. Especially developing countries regard FDIs as an important tool both in meeting their technological deficits and increasing R&D activities. Today countries evaluate economic integration as an alternative in attracting more FDI. More clearly, economic integrations result in scale economy with expanding market opportunities and causes increase of FDI inflows of countries both within and out of integration.

This study aims to put forward the kind of relationship between FDI and R&D and EU which is accepted as the most advanced integration. In this sense, it was analyzed through dynamic panel causality test whether FDI and R&D are complement or substitute of each other in EU 15 and EU 27. According to panel causality tests, while there was no relationship from R&D variable towards FDI variable both for EU 15 and EU 27; there was one way and statistically meaningful causality relationship from FDI towards R&D. That the coefficients of related FDI variables have positive signs can be interpreted as that there is a complementary relationship between FDI and R&D in the sense of EU. However, small values of these estimation coefficients points out to weak complementary relationship between FDI and R&D. On the other hand, Coefficients of estimations made for EU 15 being higher than EU 27 means that relationship is more powerful in the sense of EU 15. Recent developments in 2004 and 2007 which include transition economies (apart from Malta and Cyprus) and inclusion of small countries in EU both in the sense of population and economy can be effective in these findings.

As a result findings put forward positive and one-way causality relation from FDI to R&D in EU countries. FDI made in EU countries have positive effects on R&D activities in these countries. This study may have contribution to literature in the sense of future researches for applying different econometric methods on various country groups.

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APPENDIX

Independent Variables	Dependent Variables			
	EU 15		EU 27	
	ΔRD	ΔFDI	ΔRD	ΔFDI
$\Delta RD(-1)$	0.98752 ^a	-1.62323	1.11264 ^a	24.93975
$\Delta RD(-2)$	-0.08050	-9.02578	-0.15797	-18.59077
$\Delta FDI(-1)$	0.00093	-0.22895	0.00070	0.45957
$\Delta FDI(-2)$	0.00351 ^b	0.24564	0.00269 ^b	0.59864 ^c
Wald Test χ^2 Statics	6.62022 ^b	3.29655	7.81654 ^b	2.70283
Sargan P-Value	0.32090	0.29297	0.39797	0.33244

Notes: a, b and c, respectively, is meaningful at %1, %5 and %10 significance level. Δ represents difference operator.

Appendix 1: Results for Panel Causality Test

Mario Bogdanovic¹
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MAKING DECISION IN COMPANY DISMISSAL PROCESS

Abstract

Although all companies tend to develop and grow, the reality is also business contraction with necessity of firing company employees. This especially occurs during the global crisis and decreased demand for company goods and services that reduces company reproduction process. Therefore is employee reduction often the only solution for cost reduction and company survival. To minimize social costs, employee dismissal process should be managed fairly with all relevant criteria taken into account. Management of the company should rate actual workers performance, development potential or social criteria all objectively to get strong arguments for first selection and for making the final choice. Not all rated criteria are equally important in a specific moment so Analytic Hierarch Process is used to select and rank the employees that are taken into account for firing based on the importance of each criteria which is defined by company management. Human individuals cannot always be measured or valued by pure numbers, yet final result of this method precisely shows which candidates should be in focus for dismissal based on different information about each employee (actual performance, development potential or social criteria).

Keywords

AHP method, Dismissal criteria, Employees dismissal, Ranking, Saaty's scale

1. Introduction

In its lifetime company goes through different stages or phases. All business entities tend to grow, develop or decrease through these phases in general. Growth represents increase of material and human resources of the company (business enhancement, employment increase, revenue and profit increase or capacity increase), while development represents qualitative changes like new technologies, higher product/services quality, new markets, better quality structure of employees or higher business efficiency (Dvorski and Kovšca, 2011, pp. 378–379).

Reduction in business activities is connected with different strategies for resolving the problem surplus of employees by means of different options for regulating this problem (Buble, 2006, pp. 373–374). Although there are different strategies for resolving the employees surplus (e.g. job sharing, shortening the working time, non-paying days off, diminishing or “freezing” the salary, stimulating free abandonment of the company, earlier

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retirement, demotion, transfer to another working place, natural drain, discharge/layoff) because dismissals causes big economic, social and general social “shaking” (Bahtijarević-Šiber, 1999, pp. 235–237) that often can not be avoided. Besides exceptional situations where employee has to be fired under certain circumstances (serious contract violation for example), neither growth nor development have the aim or intention of dismissing company employees. This type of employee discharge is known as final disciplinary step (Mathis and Jackson, 2012, p. 221) and does not represent topic of this paper. Business contraction as a long term or permanent negative change in business (Dvorski and Kovšca, 2011, p. 389) on the other hand, often results in reducing the number of company employees despite the fact that company owners do not want or tend to fire someone. Dismissal process can be treated as non-voluntary separation and should satisfy the criterion of justice, in order to diminish the negative consequences like court accusation or violence toward company (Noe et al., 2006, p. 355). Therefore the whole employee dismissal process should strive to the maximum level of justice. It is a great managerial mistake when trying to convince employers that something is just and correct, when it is not, because in this situation respect and trust may be lost (Templar, 2011, p. 73), with negative impact on working and organizational climate and culture. The important managerial tool in dismissal decision process can be objective method for calculating the rank of employees which should be unwillingly separated from the company according to defined criterions. Discharge of company employees is phenomenon particularly often in times of crisis and official figures have shown that unemployment rate across the eurozone hit a new all-time high of 11,8% in November 2012 (Eurozone unemployment reaches new high, 2013). Current situation with unemployment problem worldwide confirm relevance of this topic.

2. Whom to release?

The dismissal process should also be the part of human resource management politics, so in this process we should differentiate two types of dismissal causes (Marušić, 2006, p. 309):

- a) dismissal due to the disciplinary causes (e.g. the employees who do not respect the rules of the company or even worse, who do not react to manager requests, i.e. they destroy working discipline and/or working atmosphere);
- b) dismissal due to technological surplus (which imply some employers rights).

This paper deals with the second dismissal causes, because the first group of employees is usually on the top of the manager dismissal list. To answer on the question in unwanted situation where dismissal of the employees is “an unfortunate must”, because of technological surplus reasons, certain assumptions have to be realized. This primarily refers to the permanent monitoring of the company employees and their performance. This process consists of observing employees in an ethical and legally permitted way by measuring their performance, conducting interviews, or in other words rating them in general. It is not easy to release someone, especially after long-term successful business relationship or in small rounding where people are usually bond. One thing that is critical for successful managing of labor relations is fairness, but in addition to fairness, a decision to dismiss an employee must also be lawful (Amos et al., 2008, p. 356).

Decision making tool that simplifies any problem similar to this one (certain number of different alternatives where each alternative can be described with more criteria of different level or intensity) is given in Analytic Hierarchy Process – AHP Method. The method was developed by American mathematician Thomas L. Saaty, and the core of the whole process is to make a structure where is possible to determine the importance of the elements – dismissal criteria in this example. Once the main structure is completed, the AHP is surprisingly easy to apply (Saaty and Vargas, 2012, p. 2). In this specific case, management decides which criterion has higher priority over another.

2.1. Defining criteria

Process of observing employees and rating their performance varies among different companies. Measured categories and measuring techniques both depend on many different factors.

Internal factors:

- type of business
- company size
- organization,
- Management goals etc.

External factors:

- country / region development level
- ethical environment
- competition
- Legal environment etc.

Each company management defines categories that are considered as relevant. The authors present list of relevant criteria based on their own working experience and management knowledge. Criteria determination represents the first step of dismissal process.

Observed and measured criteria:

1. Efficiency (Labeled as **Eff.**)
2. Quality of work (**Q**)
3. Ability to react and adapt to unknown situations (**Unk.**)
4. Team work (**TW**)
5. Loyalty (**L**)
6. Absences (**A**)
7. Improvement potential (**Imp.**)

2.2. Employee shortlist – alternatives and evaluation

Employees that are considered as potential for contract termination are already rated in each category only if company permanently takes care of their evaluation. Evaluation of employee's performance example is shown in Table 1.

Employee	Eff.	Q	Unk.	TW	L	A	Imp.
X Y	0,40	0,60	0,40	0,60	0,20	0,80	0,40
X A	0,40	0,60	0,40	0,60	0,20	0,60	0,40
X B	0,60	0,60	0,40	0,60	0,40	0,60	0,60
X C	0,40	0,80	0,20	0,60	0,80	0,60	0,80
X D	0,60	0,40	0,40	0,80	0,40	0,80	0,20

Table 1: Example: Shortlist and evaluation of each criterion

Evaluation of every employee based on rating all criteria is described as follows:
Chosen range for evaluation: each criterion rating with 5 levels of evaluation

Eff.:

0,20: satisfying
0,40: average
0,60: efficient
0,80: very efficient
1,00: remarkable

Q:

0,20: low quality
0,40: average
0,60: quality
0,80: high quality
1,00: remarkable

Unk:

0,20: not so good
0,40: average
0,60: good
0,80: very good
1,00: remarkable

TW:

0,20: poorly functioning
0,40: average
0,60: good
0,80: very good
1,00: pure team player

L:

0,20: not very loyal
0,40: average
0,60: loyal
0,80: very loyal
1,00: extremely loyal

A:

0,20: often absent
0,40: average
0,60: rarely
0,80: in some situations
1,00: almost never

Imp.:

0,20: low potential
0,40: average
0,60: has potential
0,80: a lot of potential
1,00: constant improvement shown

Described evaluation in mentioned example gives overall results as shown below (Σ):

Employee X Y: 3,4
Employee X A: 3,2
Employee X B: 3,8
Employee X C: 4,2
Employee X D: 3,6

Since managers find different criteria as relevant or more important, the next step is to determine list of priorities with purpose to adjust evaluated criteria to manager’s preferences. Therefore overall results gathered above have unsatisfying relevance - since evaluation or rates to be more precise are not weighted yet by manager’s priority list. Thus the procedure goes to the next step of criteria significance determination.

2.3. Significance of each dismissal criterion

Management of the company uses objectively gathered rates for each employee, yet to get needed (and final) results must determine relevance of each measured and evaluated criterion. The authors present AHP so this is realized using Saaty’s scale (Table 2).

Intensity of Importance	Definition	Explanation
1	Equal importance	Two activities contribute equally to the objective
3	Moderate importance	Experience and judgment slightly favor one activity over another
5	Strong importance	Experience and judgment strongly favor one activity over another
7	Very strong importance	One activity is favored very strongly over another, its dominance is demonstrated in practice
9	Extreme importance	The evidence favoring one activity over another is of the highest possible order of affirmation

2 – Weak, 4 – Moderate plus, 6 – Strong plus, 8 – Very, very strong (Intermediate values)
 Intensities 1.1, 1.2, 1.3 etc. can be used for elements that are very close in importance.

Table 2: Saaty’s Scale – definition and explanation of creteria domination (3, 5, 7 etc.) or subordination (reciprocal value: 1/3, 1/5, 1/7 etc.) intensity (Saaty, 2006, p. 3)

Example of management preferences and weighting of measured criteria is shown in Table 3.

	Eff.	Q	Unk.	TW	L	A	Imp.
Eff.	1	1/3	5	4	3	4	5
Q	3	1	6	5	4	5	6
Unk.	1/5	1/6	1	1/3	1/3	1/2	1/2
TW	1/4	1/5	3	1	1/2	2	2
L	1/3	1/4	3	2	1	2	3
A	1/4	1/5	2	½	1/2	1	1/2
Imp.	1/5	1/6	2	½	1/3	2	1

Table 3: Distribution of weighting criteria importance (pair wise comparison)

Values above show Saaty’s scale usage to compare all criteria to get relevance list, or in other words to get importance of each observed and rated criterion. Fractions are further calculated (1/5 = 0,20 for example) and each value from table above goes in ratio with column sum (Table 4. and Table 5).

1	0,33	5	4	3	4	5
3	1	6	5	4	5	6
0,20	0,17	1	0,33	0,33	0,50	0,50
0,25	0,20	3	1	0,50	2	2
0,33	0,25	3	2	1	2	3
0,25	0,20	2	0,50	0,50	1	0,50
0,20	0,17	2	0,50	0,33	2	1
$\Sigma= 5,23$	$\Sigma= 2,32$	$\Sigma= 22$	$\Sigma= 13,33$	$\Sigma= 9,66$	$\Sigma= 16,5$	$\Sigma= 18$

Table 4: Intermediate step to get normalized matrix

As described above, every element is further divided with its column sum.

0,1912	0,1422	0,2273	0,3001	0,3106	0,2424	0,2778	24%
0,5736	0,4310	0,2727	0,3751	0,4141	0,0303	0,3333	39%
0,0382	0,0732	0,0455	0,0248	0,0342	0,0303	0,0278	4%
0,0478	0,0862	0,1364	0,0750	0,0518	0,1212	0,1111	9%
0,0631	0,1078	0,1364	0,1500	0,1035	0,1212	0,1667	12%
0,0478	0,0862	0,0909	0,0375	0,0518	0,0606	0,0278	5,5%
0,0382	0,0732	0,0909	0,0375	0,0342	0,1212	0,0556	6,5%

Table 5: Calculated criteria importance

The last column in Table 5. calculates row average, which represents each criterion relevance. Labels (**Eff., Q, Unk. TW, L, A, Imp.**) are excluded from Table 4. and Table 5. due to calculation table simplification. Hypothetical management from this example find working quality and efficiency as two most relevant criteria.

3. Employees ranking and final choice

Evaluation results from Table 1 are further being multiplied by the criterion weight to get final score. For example, assigned score in Team Work category (0,20; 0,40; 0,60; 0,80 or 1,00) is being multiplied by 9%. The rest of calculation is shown in Table 6. This specific case shows that employee XA achieved worst results in regard to the management requirements. The authors present a simple example that can be easily implemented in any organization. This method will be of special benefit in organization with larger number of employees where many of whom show similar performance.

Employee	Eff.	Q	Unk.	TW	L	A	Imp.	TOTAL
X Y	0,096	0,234	0,016	0,054	0,024	0,044	0,026	0,494
X A	0,096	0,234	0,016	0,054	0,024	0,033	0,026	0,483
X B	0,144	0,234	0,016	0,054	0,048	0,033	0,039	0,568
X C	0,096	0,312	0,008	0,054	0,096	0,033	0,052	0,651
X D	0,144	0,156	0,016	0,072	0,048	0,044	0,013	0,493

Table 6: Obtained results and final ranking

Making final decision in dismissal process does not necessarily have to be strictly related to the result of AHP method. Although AHP method can be very important managerial tool for

making decision regarding employee dismissal, it should not be the only tool/method for dismissal decision. Since dismissal of employees have serious business, economic, but also emotional-psychological and social consequences, in this process beyond management (as owners representatives) professional team from the HRM department and Union representatives can be also involved. Situation where decision or agreement is achieved by the consensus between management, professional team from the HRM department and Union representatives represents good solution.

So by means of the AHP method with the assistance of professional (e.g. criteria of employers potential development and "soft" people characteristics which can not be measured only with figures) and social Union support (who should include different social criteria- e.g. difficult family situation), maximum level of the justice principle in dismissal process can be achieved. When dismissal process is done correctly (by means of AHP method as a main managerial tool in dismissal process) and after discussion plus consensus with professionals from the HRM department and Union representatives, and after detailed and kind explanation to employees who should be separated from the company, the negative dismissal effects can be prevented in a two way sense. Firstly in sense of the company wellbeing in terms of angry employees who have to leave the company against their will (e.g. court accusation, aggression toward management), and in terms of deteriorated working and organizational climate for the employees who are staying in the company. Secondly in sense of the psychological strengthening of dismissed employees, who in the case of just and socially kind dismissal procedure can confront their difficult situation much more easily.

4. Conclusion

Dismissal is an organizational procedure for diminishing the employee number. The paper resolves the problem of objectively righteous dismissal of employees in case of technological surplus by means of AHP method. Using AHP method management can objectively choose those employees for dismissal who have shown the worst performance according to the nominated criteria (e.g. efficiency, quality of work, ability to react and adapt to unknown situation, team work, loyalty, absences, improvement potential etc). AHP method represents very good basic tool/method which can facilitate this kind of decision, namely dismissal decisions are never an easy ones.

Since dismissal have serious business, economic, but also emotional-psychological and social consequences, in this process beyond management (as owners representatives) some other things may be included: professional team from the HRM department and Union representatives. Well balanced dismissal solution can be achieved in situation where final decision is result of the consensus between management, professional team from the HRM department and Union representatives.

Namely when dismissal has been done correctly (by means of AHP method as a main managerial tool in dismissal process) and after discussion and consensus with professionals from the HRM department and Union representatives, further after detailed and kind explanation to the employees who should leave the company, all or most negative dismissal

effects can be prevented in a two way sense. Firstly in sense of company wellbeing in terms of calming down angry employees who should leave the company although they do not want to (e.g. court accusation, aggression toward management), and in terms of diminishing the consequences of deteriorated working and organizational climate for the employees who are staying in the company. Secondly in sense of the psychological strengthening of dismissed employees, who in the case of righteous, just and kind dismissal procedure can confront their own unwanted and difficult situation much more easily and with less stress.

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FINANCIAL INSTABILITY OF ENTERPRISE AS THE MAIN OBSTACLE HAMPERING DEVELOPMENT IN TURBULENT ENVIRONMENT

Abstract

This research is related to simulating the leading indicator of financial instability of an enterprise – with a view of issuing an early warning as to about possible forthcoming changes in the enterprise’s activities. This index has been acknowledged as the leading one with respect to the enterprise, since it can reflect the future financial capacity, based on the initial data already available. The financial stability concept implies diagnostics of an enterprise’s activities on a long-term horizon. The first group of financial stability indices operates with discreet findings; the second group of financial stability indices is capable of reflecting continuous random variables. The diagnostics process consists of two stages – the analysis of the past activity of enterprise and the simulation of its future activities. At the second stage, experts encounter the fundamental problem of forecast inaccuracy and unpredictability of results for years ahead. The goal of this research is to supplement the enterprise financial stability concept and to simplify the tasks of simulating the future activity - by working out and using the leading indicator. The object of research is the activity of three conspicuous Latvian enterprises operating in three well-known sectors of economy. The subject of research is financial stability of enterprise, characterized by harmonic functioning of the activity and the process. The main problem to be solved to attain the goal is the validation of the future financial instability index as a leading indicator and the proof of its efficiency. In process of research, monographic method, comparative analysis method, and method of induction as well as some other mathematical and econometric approaches were used. The results obtained are of practical nature, since they allow one to simplify the procedure of enterprise finance stabilization under a turbulent environment by using the possibility of obtaining important information describing future shocks.

Keywords

Activity, Financial stability, Leading indicator, Process

1. Introduction

The concept of financial stability implies diagnosis of enterprise activity in the long term. The basis of the concept is division of analysis tools into two groups. The first group of financial sustainability indices operates with discrete results, while the second group consisting of financial stability factors is capable of reflecting continuous quantities.

The diagnostics process consists of two stages: analysis of the past and simulation of the future activities of the company. At the second stage, experts normally face a fundamental problem of inaccuracy and unpredictability of forecasting results for many years to come. This problem can be solved by simulating alternative scenarios that could change depending on future changes in the internal and the external environment of the company. The need to

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adjust the scenarios should be determined by the value of an integrated indicator, which can alert the managerial staff of the company in advance as to potential threats of upsetting stability condition.

The purpose of this study is to complement the concept of financial stability of a company and to simplify the tasks of simulating the future activities through the development and use of the leading indicator.

The target of research is the activity of some well-known Latvian enterprises operating in three different sectors of economy. The scope of research is financial stability of the company characterized by the harmonious functioning of the activity and the process. To hit the target, the main thing is to test the future financial instability index as the leading indicator and to prove its efficiency. This task is solved by using official data received from some well-known enterprises. The research period has lasted 10 years – from 2001 to 2010.

In the course of research, the following techniques were used: monographic method, method of comparative analysis, method of induction and other mathematical and econometric techniques.

The findings are useful since they allow one to simplify the process of stabilizing the company finance in turbulent environment through the possibility of the timely receipt of important information concerning future perturbations.

2. Turbulent environment and its influence on enterprise finance

The modern stage of development of economy is associated with a lot of factors. After the global economic recession swept the world in 2008, a certain solution was continuously sought for under the grave situation that had occurred. All of the approaches and methodologies suggested within the last five years are subdivided into two groups – political and economical ones.

Advocates of the approach of the first group consider necessary some continuous changes of external environment to bring about economic and social alignment, i.e., convergence. This approach seeks to find an optimal balance of all elements of the system by virtue of the State's efforts to ensure prosperity in the long run. However, it happens frequently that such declared goals are not achieved. This may be due to the system elements' inability to maintain balance for a long period of time. Even as a result of manipulations with external environment, a short-term balance only is achieved; continuous changes of all factors of the system take place in the course of economic development, which leads to the necessity of reviewing "the optimal vector". As a result of permanent correction of those factors under a continuously changing turbulent environment, experts eventually cease to understand each other. The essence of this problematic situation is external environment's inability to control the system. Therefore, the existence of this approach is impossible if isolated from the concepts of the second approach.

The second approach focuses on analysis of the system from the inside - through study of the principles of functioning of the system structures and the interaction between its elements, thus giving one an opportunity to receive information on economic potential and the extent of its use.

The economic potential is formed through the interaction of such subjects of economic system as enterprises, lending institutions, insurance and financial companies and households. In this article, the first subject of the system – an enterprise - is regarded as the key subject. This choice is accounted for by the degree of freedom of using the financial potential of the subject in question. Since the activity of lending institutions, financial and insurance companies is strictly regulated by State and international legal and legislative acts, the company was offered a greater flexibility of its finances. As regards households, they can not enjoy such a high freedom since they possess a far inferior financial potential.

Thus, the internal element of economic system operating under turbulent environment, which possesses the highest manoeuvrability, is a company. Therefore, optimization of activity of this particular subject is capable of raising the economic potential of the State.

According to the theory of financial stability developed by V. Kovalev (2002), I. Blank (2004, 2005), R. Kaplan and R. Norton (2007), L. Gilyarovskaya (2006) and E. Altman (1993, 2002) the current potential of a company is determined through calculation of its financial potential. This is accomplished by the current activity financial ratios determination method based on using the company's financial data reporting. However, such an analysis reflecting discrete past performance is inadequate for the development of the enterprise under a turbulent environment.

For the company development in the long term, the author examines the concept of financial stability as harmonious interaction of activities and processes within a specific system's framework. A set of methods of this approach allows the enterprise to successfully build and use its financial capacity for a long period of time, through the transition from financial sustainability to financial stability.

3. Financial potential of enterprise from the perspective of time

In order to obtain objective knowledge about the company's activities, the managerial staff use various data generated by various divisions and departments of the company. As a rule, in order to determine a current state of performance, all the tasks are reduced to evaluation and comparison of the past and the current potential of activities. Practice shows that experts' opinions differ because different methodologies involve an analysis of various, and often multifaceted components of financial capacity. When a calculus tool is focusing on efficiency, while another one – on productivity and the third one is focusing on variability, no homogeneous result can be obtained. As regards interpretation of such a distorted result, conclusions and recommendations are distorted even to a greater extent, as a rule. Ultimately, the company management not only fails to receive necessary information in support of decision making, but is being misled since there is no more way to check exactly which specific component of financial potential was analyzed by expert.

Within the framework of the research performed by the author, a financial model of enterprise should be presented as a system of interaction of activities and processes. The model in question enables one to make parallel investigations of the activities run by the company under the influence of many different processes. At this point, one can identify the stability of the activity itself, not excluding the essence of the impact rendered by processes. If the activity is stable, there is no point of subjecting it to the impact from processes. But, if the activity is unstable, it is necessary to identify the extent of the impact rendered by processes, which would enable one to find and determine compensatory mechanisms capable of stabilizing the activity (Olve, Roy and Wetter, 1999; Scott, 2000; Teslinov, 2011; Van Horne and Vachowicz, Jr., 2001).

Stabilization of activity is reflected in the financial potential of enterprise over time. Therefore, a model is required that could trace the financial potential of enterprise in the long run. Such a model cannot be developed on a one-sided concept of financial position or financial sustainability; as a must, the model should include the trends of changing the key parameters of activity with respect to future periods.

Thus, the financial potential of enterprise should be assessed from the perspective of time, – in the short and long term, respectively. As regards the financial stability approach the methodology of which enables one to analyze continuous performance results, the theory of financial sustainability analyzes only moment quantities of financial condition at the given moment. Consequently, the methodology of ratio analysis of financial sustainability determines discrete variables from the perspective of time, whereas the methodology of financial stability enables one to identify trends based on the analysis of continuous variables.

Financial potential from the perspective of time	Short-term prospects	Long-term prospects	Pattern of result	Recommended approach
Assessment of past activities	Very efficient	Efficient	Continuous	Stability
Assessment of current activities	Efficient	Inefficient	Discrete	Sustainability
Assessment of future activities	Inefficient	Very efficient	Continuous	Stability

Table 1: Financial potential analysis methodology time-orientated comparison

Discreteness and continuity of findings obtained by these approaches is a core principle of the analysis where identifying and forecast of continuous data come to the fore. Discrete data in this task enables one to set some known standards for the basic criteria of stability of activities, the control of which enables one not only to state an accomplished fact but to perform a discrete valuation of a model scenario of the activity development in future, where usage of data in advance is a compulsory requirement.

4. Analysis of discrete data in assessing financial sustainability

Financial sustainability of an enterprise is a definite set of criteria the values of which lie within some definite preset ranges. From the standpoint of research performed by V. Kovalev (2002) and L. Gilyarovskaya (2006) financial sustainability of any profit-making company is its solvency, i.e., the availability of a mortgage debenture with respect to the company's assets. The investigation performed by Kaplan and R. Norton (2007) has expanded this object domain to system presentation. The authors have come to the conclusion that provided this principle is observed within the framework of the preset system, it would seem inexpedient to consider each criterion individually or to try to unite all possible sustainability criteria into a single set.

Taking into account the statement mentioned above, a single individual value of a criterion can not fully describe an activity, while any attempts to unify all of the known sustainability criteria of the enterprise into a single set lead to heterogeneity of results with respect to the samples that also often contradict to each other.

While interpreting these results reflecting a definite period of time, experts face with the problem of discreteness of extracted values. Since financial sustainability criteria are based on such a form of financial reporting as accounting balance sheet and the annexes enclosed thereto, one must reckon with the fact that the economic sense of the received result is discrete, i.e. it reflects the situation as of the current moment - the end of the financial year.

The problem solution in terms of division of the study timeframe is to present the financial potential of companies in two time prospects – short-term and long-term ones. The use of criteria in this case, from the perspective of time, is pre-conditioned by two different approaches and toolsets.

Within the framework of the author's study, financial sustainability of the company is assessed according to a respective rating developed. The main components of sustainability are liquidity and solvency. By graphically combining the two components, "sustainability quadrants" are formed, whereon the obtained values, characterizing the standard-meeting level with respect to received indices, are marked. Thus, rating A, B or C is formed with respect to each component, depending on the indicator scale received.

Financial sustainability is formed by 9 main coefficients generalized in the Table below:

No	Name	Designation	Indicator most affected	Parameters used when calculating indicator	Recommended value
1	Current assets of company's own	$Wcap$	Solvency	$CL, CA (Inv, AR, C)$	$Wcap > CL$
2	Current liquidity ratio	Kcl	Liquidity	Inv, AR, C, CL	≥ 2
3	Liquidity turnover ratio	Kfl	Liquidity	AR, C, CL	≥ 1
4	Absolute liquidity ratio	Kal	Liquidity	C, CL	$0,5 - 1,0$
5	Current assets coverage ratio	Kwc	Solvency	$Wcap, CA, (Inv, AR, C)$	$\geq 0,1$
6	Working capital share in stock cover	Ws	Solvency	$Inv, Wcap, (Inv, AR, C)$	$\geq 0,5$

7	Stock cover ratio	W_{jsc}	Solvency	$W_{cap}, JSC (Inv, AR, C, BL, CR)$	No recommendations
8	Current assets to equity ratio	Me	Solvency	$E, W_{cap} (Inv, AR, C)$	No recommendations
9	Maneuver capability of company's own circulating assets	M_{wc}	Solvency	$C, W_{cap} (Inv, AR, C)$	0,0 – 1,0

Table 2: Financial potential discrete data analysis instruments

where: CL – current liabilities;

CA – cash reserves (current assets): $CA = Inv + AR + C$;

Inv – stock;

AR – accounts receivable;

C – cash resources,

JSC – logically substantiated stock cover sources;

$JSC = W_{cap} + BL + CR$.

BL – bank stock loans,

CR – accounts payable for raw materials,

E – shareholders' equity.

Financial sustainability substantiated by the discreteness of essence of results, shows the state of the company under investigation in the short term. The values in question are useful for financial analysts both analyzing the past and the current activities and assessing the sustainability of future development scenarios. However, one should bear in mind the fact that these values characterize the time-related control points of future scenarios rather than tendencies which are continuous in essence.

5. Analysis of continuous data in assessing financial stability

Continuous data obtained in process of analyzing trends, are quite fit for assessing financial potential in the long run. Such data is capable of reflecting the potential-changing dynamics both with respect to a period of the last activities and when simulating the future activities. The main purpose of the analysis of continuous data within the framework of the author's study is to identify and formalize financial stability criteria.

The methodology of research of continuous data and analyzing the company's finance in the long run is revealed in the works by R. Higgins, T. Copeland, T. Coller, J. Moorin, A. Dolgoff, and I. Ivashkovskaya (Fonseka and Tian, 2011; Copeland, Koller and Murrin, 2008; Copeland and Dolgoff, 2006; Ivashkovskaya, 2012). Within the framework of a system-based presentation, from the perspective of the long run, the development of integrated indicators is coming to replace the system of financial ratios.

The enterprise growth theory proposed by R. Higgins (Fonseka and Tian, 2011) in the 80-ies of the 20th century, originally anticipated calculation of planned sales growth in a subsequent period based on current data. At present, the sustainable growth pace also requires formation of a balance between all many-sided objectives of a company. The

parameters of this equation include, for example, the planned capitalization of profits and the level of dividends, the planned level of turnover and capital coefficient of assets, the planned leverage of company-owned and borrowed funds, and some other purposes. These goals are difficult to be agreed among themselves, since, according to Pareto principle, achieving one of the goals, to a certain extent, prevents one from achieving another. Ultimately, the goals may be balanced in such a way that the result is absolutely stable and equal to zero. It is exactly in this situation that financial sustainability is achieved. But as soon as the growth rate becomes positive as a result of interaction of the parameters, this suggests possible development of activities in future by way of using the current financial potential.

If the available potential is sufficiently used, a number of changes concerning criteria supporting the increase of business value take place in the company. In the opinion of T. Copeland, T. Koller and J. Murrin (2008) who had generalized the theory of cost estimate of a company for the first time, the discounted cost index of a free cash flow is an integrated indicator of company's activities. This index includes all the business activities - from the smallest incoming payments to the largest outgoing ones; the included business activity is corrected with due consideration for depreciation deductions and changes in current assets. Therefore, within a number of years a general wave of positive and negative financial flows is formed. This value, depending on the purposes of analysis, may be given, i.e. discounted, with respect to weighted average capital cost at any given time. At this point, discreteness of the value and continuity of trends come into contact.

In the studies performed by I. Ivashkovskaya (2012), a number of cost dynamics-tracking models have been developed, that demonstrate this figure as the most objective and successful indicator of activities. Consequently, the financial stability of the enterprise implies the use of the existing financial potential in the long term in order to create value. The author considering growth rapidity indicators as predictor of possibilities, and considering value as a result of realizing them, forms "sustainability quadrants", whereon the obtained values, showing the standard-meeting level with respect to received indices, are marked. Thus, rating A, B, or C is formed with respect to each component - depending on the indicator scale received. The main indicators of growth rapidity change and creation of value are generalized in the Table as follows:

No.	Name	Designation	Indicator most affected	Parameters used when calculating indicator	Recommended value
1	Sustainable growth ratio	SGR	Growth rapidity changes	Pr, P_n, S, E, D, A	$SGR > 0$
2	Sustainable growth ratio under changing conditions	SGR_g	Growth rapidity changes	$E, div, S/A, D/E, P_n/S, b, S_0$	$SGR_g > 0$
3	Future cash flow	FV_t	Cost	$P_n, Dept, A, NI, ROIC, g$	$FV_t > 0$
4	Current cash flow	PV_t	Cost	$FV_t, d, P_n, A, NI, ROIC, g$	$PV_t > 0$
5	Total present value integrated	PV	Value	$C_0, N, PV_t, FV_t, d, P_n, Dept, A, NI, ROIC, g$	$PV > 0$
6	Weighted average capital cost	$WACC$	Value	$w_S, R_c, w_D, d_D, t_s, R_f, R_m, \beta$	$WACC < g$
7	Further present value at the	$PV_{term, N+1}$	Value	$FV_{term, N+1}, N,$	$ROIC > W$

	end of forecast period			$FV_{N+1}, WACC, g, P_n, Dept, A, NI, ROIC, w_S, R_c, w_D, d_D, t_s, R_f, R_m, \beta$	ACC $ROIC > g$
8	Enterprise value	$PV_{project}$	Value	$PV, N, PV_{term, N+1}, FV_b, FV_{N+1}, WACC, g, P_n, Dept, A, NI, ROIC, w_S, R_c, w_D, d_D, t_s, R_f, R_m, \beta$	$ROIC > W$ ACC $ROIC > g$
9	Further value in an indefinite term	$PV_{term g=const}$	Value	$NOPLAT, ROI_g, g, WACC, w_S, R_c, w_D, d_D, t_s, R_f, R_m, \beta$	$PV_{term g=const} >$ $PV_{term, N+1}$

Table 3: Financial potential continuous data analysis instruments

wherein:

P_r – increase in retained profit;

P_n – net profit;

S – target sales volume;

E – ownership capital as of the beginning of the current period;

D – borrowed capital as of the beginning of the current period;

A – Company's assets;

S_0 – sales volume within the current period;

$Dept$ – depreciation;

NI – investment rate;

T_{DO} – period of time preceding the pay-back period;

N – prediction period;

$NOPLAT$ – net operating profit after deduction of adjusted taxes;

ROI_g – incremental profitability of new investment capital;

w_S – ownership capital share within the general capital structure;

R_c – earning power (profitability) expected by shareholders;

w_D – gearing (borrowed capital share within the general capital structure);

d_D – lending interest rate;

t_s – profit tax rate;

R_f – risk-free rate;

R_m – expected return of the market;

β – systematic risk ratio;

$ROIC$ – Return on Invested Capital;

g – expected growth rate for an indefinite term.

The financial stability determined by the continuity of the essence of results shows the state of the investigated company in the long term. The values in question are useful for financial experts both when analyzing the past activities, where they prove their efficiency, and in process of assessing alternative development scenarios in future.

6. Simulation of leading indicator of financial instability

In process of simulation and assessment of alternative scenarios of development under a turbulent environment, one must bear in mind that stability-creating mechanisms are efficient provided the corresponding pre-requisites exist. In this connection, the main

obstacle to the company development under a turbulent environment is financial instability of the company's financial potential.

In other words, working out a future development scenario implies formalization of those instability processes that are most likely to occur. Moreover, the possibility of occurrence of those formalized processes unbalancing the activities should be identified prior to the advent of those processes. To make an early warning of the managerial staff, the task in question shall be solved by way of simulation and proof of the leading indicator efficiency.

Within the framework of the author's study, the indicator in question is expressed as financial instability index and reflects the future unbalance between different integers of the company. In process of simulation of the indicator, the principles of advance, polarity, irreducibility, commensurability, and adequacy have been applied (Chernavsky, 2011, 2012; Kopitov, Faingloz and Chernavsky, 2012).

The index is based on current activities, is an integrated indicator of disruption of stability and growth in the future period; after some transformations, it is expressed by the following formula:

$$FFI = w_1 \frac{A_0}{S_0} + w_2 \frac{D}{A_0} + w_3 \frac{Exp}{S_0} + w_4 \frac{CL}{CA}, \quad (1)$$

wherein:

FFI (Future Financial Instability) – future financial instability index;

A_0/S_0 – current ratio of capital intensity;

D/A_0 – scheduled combined insolvency ratio;

Exp/S_0 – scheduled loss ratio;

CL/CA – scheduled coefficient of net capital intensity;

w – weight or percentage of overall index parameters.

Recommended values: $FFI < 0,8$; $A_0/S_0 < 1$; $D/A_0 < 1$; $Exp/S_0 < 1$; $CL/CA < 1$.

By assessing unbalance between the objectives and the destruction extent of the current financial potential, the indicator in question can show the planned degree of financial instability for the subsequent period. The indicator saturation principle is unidirectional one; it is preset within the limits of 20% according to Pareto law as well; consequently, approximation to a preset limit means launching the most powerful destructive forces destroying financial potential. Thus, the most essential function of the indicator is to notify about an imminent possibility of the advent of the above-mentioned phenomenon. Since predicting the advent of a definite phenomenon reflects the essence of the trends typical to those phenomena, the indicator in question is a reflection of development trends characterizing the company's financial potential.

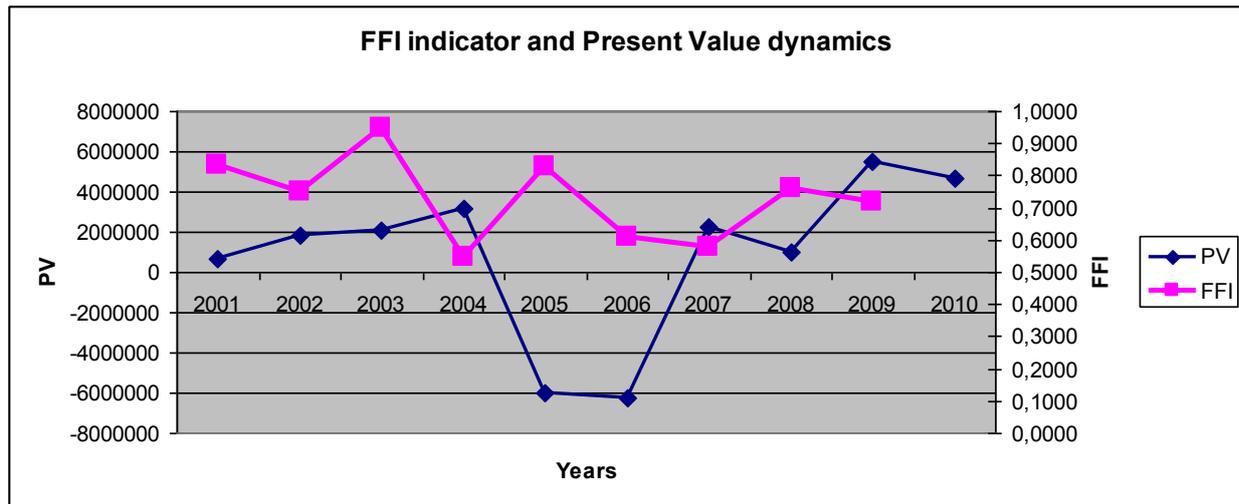


Chart 1: FFI Indicator and present value dynamics comparison

Since value is an integral reflection of activities, this diagram shows the dynamics of discounted value of a well-known Latvian pharmaceutical company, as well as the dynamics of the leading indicator of financial instability (<http://www.lursoft.lv>). Despite the obtained financial sustainability index «AA», the graph shows that the company underwent a strong decline in value during the period from 2004 to 2006; however, within the period from 2004 to 2006 the company was able to pull out its free cash flows to the former and even a higher level. In the first above-mentioned case, a leading indicator of financial instability came out in a critical area in early 2004, which attested to the forthcoming problems already at that time. In the second case, i.e. during the recession period of 2005 – 2006 when the value was negative, the indicator came out of the critical area. This fact also testified that financial stability criteria had been defined correctly, and the financial potential available to the company had been used in full already a year before the upswing.

By considering the parameters of the indicator as summarized in the Table 4, one can come to the conclusion that some erroneous steps directly causing loss in value had been taken in the past; moreover, a conclusion can be made concerning the actions that were compensatory mechanisms in the solution of this problem.

Parameters of FFI indicator	Early 2004	Early 2005	Early 2006	Early 2007
CL/CA	1,073991076	-0,237371014	0,654742972	0,189598617
A_0/S_0	0,84280475	1,131708556	1,143288293	1,02325683
D/A_0	0,784922927	0,268207797	0,455452641	0,19989205
Exp/S_0	1,097760494	1,021562697	1,051896073	1,022917329
FFI	0,9499	0,5460	0,8263	0,6089

Table 4: Sensitivity analysis on FFI index parameters

On analyzing the equation (formula 1) parameters with respect to key periods characterized by the highest variability, one can draw a conclusion on the main problem that had been solved by the company successfully. The loss of free cash flow at the company was caused by a parameter which was the most sensitive one for the company – the planned net capital intensity. The problem is connected with a mistake in working capital management and non-observation of the rule of financing of long-term investments. In early 2004, the company

has created a situation where long-term investments were financed by short-term loans, which lead to a sharp loss of free cash flow.

However, on having managed to solve that problem by early 2005, the company faced the challenge of total capital intensity, which attested to the fact that the assets acquired were too large with respect to the planned sales. Throughout the whole period of investigation, no problems with the leverage of equity and borrowed funds were observed; however, the planned sales volume was short to cover the current expenses, although the company had been working profitably.

The efficiency of the leading indicator has been tested in process of analyzing the activities of 18 well-known Latvian companies from 3 different sectors of economy; developing a multi-factor regression model implies that all the four parameters are meaningful. In the course of checking observation of the model adequacy principles, it was found that correlation between dependent and independent variables is missing; furthermore, no autocorrelation, multicollinearity, and heteroscedasticity of remnants were stated. In this connection, the model adequacy was acknowledged, and it is possible to use the model in problems of financial diagnostic of the company.

In the process of ensuring financial stability, the indicator was recognized as a leading one, as it may show future continuous efficient value-cost when using current data of financial statements.

7. Conclusion

The accomplished study complemented the concept of financial stability of the company and simplified the task of simulation the future activities through the development and use of the leading indicator of financial instability.

The use of the indicator in question enables the managerial staff of the company to receive early warnings as to about violations and unbalance in the company's activities some time in advance - prior to their occurrence. The necessity of using the indicator is motivated by a possibility of identifying some implicit threats to financial potential through the analysis of four main parameters of equation. The effect rendered by each individual parameter implies a definite degree of destruction of the financial potential stability. The findings received through the analysis of empirical material prove that the financial instability indicator is capable of detecting threats of instability even under the circumstances where the financial potential is acknowledged admissible in terms of sustainability and stability. This is primarily due to the essence of leading values. This example clearly shows that the company has violated the principle of financing long-term investments as early as in 2004, and has subsequently corrected this problem by early 2006. Accordingly, data on the value of business is showing a sharp decline in 2005 and the subsequent stabilization by the end of 2007. It should be noted that the situation in terms of stability and growth rate changes of the company was good enough during the whole period of the study.

This result is not a contradiction but rather a supplement to the concepts of financial sustainability and financial stability, as in this study using a systems approach the assessment was conducted from the perspective of two-level separation of financial potential. The assessment of financial potential was presented from the perspective of activity and processes and from the perspective of time – both in the long and the short term.

Compliance with this principle is the main recommendation to simplify the procedure of stabilization of the company's finance in a turbulent environment, through the possibility of a timely receipt of important information about future perturbations, which should be used in the simulation of financial potential in the long run.

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THE EFFECT OF EMPLOYEE'S COMMITMENTS ON CUSTOMER'S LOYALTY BASED ON TRANSACTION COST

Abstract

Few researchers, such as Hansen, Sandvick and Selnes (2003) and Jones, Taylor and Bansal (2008), have mentioned about the effect of employee's commitments and individual commitment on consumer's loyalty for products. This study aims to integrate the organizational commitment provided by Hansen, Sandvik and Selnes (2003) with the affective commitment and the calculative commitment presented by Jones et al. (2008) to explore the three types of commitments which affect customer's loyalty to the providers. Individual commitment, employee commitment, affective commitment and calculative commitment are selected as research variables. The research attempts to understand the factors and the effects of different commitments on consumer's loyalty and consumer's willing to continue consumptions under the agent's services from the different insurance companies. The 300 consumers serviced by insurance agents are selected as research samples. The research method is applied questionnaires analyzed by multiple Hierarchical Regression analysis. The research results show that employee's commitments and individual commitments positively influence the calculative commitment and the affective commitment which affect consumer's loyalty. Transaction cost does not have positive effect on consumer's loyalty.

Keywords

Affective commitment, Calculative commitment, Employee commitment, Personal commitment, Transaction costs

1. Introduction

According to national policy to push forward insurance policies, many people have experiences to interact with insurance agents for transportation or medicare insurances because of risks increase in the living environments. The interaction relationship between agents and customers may influence customer's interest and rights. Therefore, this study aims to explore the influential factors which will affect customer's intentions of consumption or commitments to continue accepting services from the same agents or the different agents to maintain their insurance interests.

Relationship marketing is currently one of research important subjects in the marketing field aiming to build, develop and maintain the mutual interest relationship between transaction parties (Morgan and Hunt, 1994). In fact, customer's intention to stay with the same agent is easily shaken at the high competitive financial market. Customers change their retention

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according to the insurance interests provided by insurance agents; therefore, those who offer better insurance plans they keep relationship with them. The key point for financial businesses to maintain competitive abilities is to keep good and trustworthy long relationship with customers; that is, the commitments from consumers to keep with insurance agents is influential factor for insurance providers to retain competition in the financial market. Commitment (desire to keep the important relationship) is seen as a relationship established in market (Moorman, Zaltman and Desphande, 1992). Commitment, generally described as a desire to maintain a valued relationship (e.g., Moorman et al., 1992), is recognized as one of the building blocks of relationship marketing (Palmatier et al., 2006). Therefore, commitment as a research indicator can be found in the different forms and dimensions (Meyer, Becker and Vandenberghe, 2004). According to researches studied by Jones et al. (2008), commitment as an indicator has two different perspectives, from the perspective of existence it can be divided into two relationships: between consumers and service organization and between consumers and individual employee; from the perspective of role application it means business friendship. Therefore, both relationships exist in the internal one between customers and employees, and the external relationship of service provides, for example friendship. Further, based on the existence perspective Jones et al. (2008) divided commitment into three indicators as organizational commitment, employee commitment and individual commitment based on essence (organization to employee) and role (service provider to friendship). According to the perspective of role application, added value is proved as friendship between service providers and customers which can increase towards the loyalty of service organization. Further, Hansen et al. (2003) divided organizational commitments into affective commitment and calculative commitment with the interactions between service employees and companies. Therefore, Jones, Reynolds, Mothersbaugh and Beatty (2007) also distinguished affective commitments with calculative commitments; therefore, the former one to stay is to want because of the internal desire; the latter one to stay is necessary based on the certain consideration.

At the past time, the researches related to employee and individual commitments are rare (Jones et al., 2008), but both commitments are important for customer's willing to stay with service providers. Organizational commitment is divided as affective commitment and calculative commitment provided by Hansen et al. (2003). Jones et al. (2008) provided organizational, employee and individual commitments. This research aims to integrate the commitments provided by Hansen et al. (2003) with three commitments provided by Jones et al. (2008) through the concept of transaction costs as interfered variable proposed by Jones et al (2007). The purposes of the study are (1) to explore the effects of employee's and individual's commitments on emotional and calculative commitments, and (2) to examine the effects of emotional and calculative commitments on customer's loyalty to maintain consumption; (3) finally to explore the interfering effects of transaction costs concerning affective and calculative commitments on consumer's loyalty to continue consumption. The research method applies multiple Hierarchical Regression analysis. 300 customers serviced by insurance providers are selected as the research samples in order to explore customer's loyalty to stay with their insurance agents.

This research is a quantitative study. This study proceeds as follows: Section Two reviews the theoretical arguments and some existing findings related to affective, calculative and individual commitments, and loyalty. Section Three illustrates the research design, including

research model and hypotheses, research methods (i.e. sampling and measurement). Section Four presents the data analyses and hypotheses testing results. Section Five discusses our research findings, and finally, Section Six draws conclusions and provides suggestions to maintain loyalty between consumers and agents.

2. THEORETICAL BACKGROUND

Consumer's intention to stay is seen as the same dimension as consumer's loyalty, re-consumption or behavior. Jones, Mothersbaugh and Beatty (2000) used re-patronage behavior or intentions to study consumer's decisions to continue or terminate credit card membership. Consumer's intention to stay is often mentioned regarding the relationships between buyers and sellers aimed to keep current consumers, but not new consumers (Harley, 1984; Crosby, Evans and Cowles, 1990). As Ajzen and Fishbein's (1980) studies, good quality services, concern with consumer's demand and good prices for consumers are helpful to solidify the relationships between consumers and service providers. According to the mentioned researches, intention of patronage is easier than factual behavior to evaluate and study; therefore, many researches, such as Garbarino and Johnson (1999), Zeithaml, Berry and Parasuraman (1996), applied the intention to re-patronage to study consumer's intention to stay. Bolton et al. (2000) and Gerpott et al. (2001) defined the intention to stay as consumer's intention to re-patronize or re-buy certain products or services. This study uses the concept of intention to stay as one of research variables provided by Bolton et al. (2000) and Gerpott et al. (2001).

In addition, commitment is an influential factor to maintain mutual relationship and long-term interests. Commitment is an intention including promise, pledge and undertaking (Dwyer, Robert and Schurr, 1987). Moorman et al. (1992, p. 316) defined commitment as a continuous desire to keep important relationship. Relational commitment is meant trading partners, that is, it is essential to keep continuous relationship (Morgan and Hunt, 1994, p. 23). Garbarino and Johnson (1999, p. 73) perceived commitment as consumer's feeling, loyalty, concern with welfare and identity. Geyskens, Steenkamp, Scheer and Kumar (1996) divided commitment into two factors: affective commitment and calculative commitment, both are stable attitude and belief, but both motivations to keep relationship are different; the former illustrates the existence of joy and belonging to provide intention to maintain the relationship; the latter expresses to recognize the costs of termination and transaction when removing the relationship, therefore, to keep relationship is necessary. Dwyer et al. (1987) perceived the concept of commitments as absolute, clear and definite promise between trading partners. Brown et al. (1995) provided instrumental commitment and normative commitment, and Geyskens et al. (1996) used calculative commitment and affective commitment. Gilliland and Bello (2002) provided calculative commitment and loyalty commitment to explain the relationships between two partners. In this study, calculative and affective commitments are applied as research variables illustrated as follows:

(1) The relationship between affective commitments and the intention to stay.

Konovsky and Cropanzano (1991) provided that the relationships between consumers having consumption commitment and trading partners existed positive and closed affective relationships. The company having affective commitments possesses enterprise philosophy,

goal and the sense of value, which have produced the perception of unity (Kim and Frazier, 1997a), and the emotional connection, then these perception and connection make both partners want to continue cooperation (Allen and Meyer, 1990; Meyer and Allen, 1991). In the relationship of distributions, affective commitment is overlapped with calculative commitment. Both have the element of continuous relationships existed at the same time, but both commitments are made by different factors (Gilliland and Bello, 2002). Bansal et al. (2004) provided affective commitment influenced by satisfaction and trust, and calculative commitment influenced by transaction costs and the choice of partners. If consumers have high affective commitments towards service companies which make them to keep the relationship and the intention to stay with companies. This commitment, excluding the evaluations of instrumental cost and benefit, develops from happy relationship and cooperation partnership. Therefore, affective commitment in any dimension trend to keep status quo (Mathieu and Zajac, 1990; Kumar et al., 1994; Wieselquist et al., 1999), therefore; commitment is a kind of positive behavior. Selnes and Gronhaug (2000) found that affection and providers have mutual influences which make consumers have higher intentions to keep relationships and to stay in organizations, further to share their experiences with others. According to the findings done by Hansen et al. (2003), affective commitment has positive influence on consumer's intentions to stay. Therefore, affective commitment is chosen as research variable in this study.

(2) The relationship between calculative commitments and the intention to stay

The power of partners having calculative commitments to maintain cooperation comes from the consideration of economic dimensions, such as interests or costs (Allen and Meyer, 1990; Meyer and Allen, 1991). If terminating cooperation, the interests are scarified which caused loss (Brown et al., 1995; Geyskens et al., 1996; Gilliland and Bello, 2002); therefore, under considering the interests, it needs to continue cooperation (Kim and Frazier, 1997b; Meyer and Allen, 1991). Calculative commitments belong to rational and assignable orientation; that is, in calculating the interests with continuous relationship and loss because of the termination of relationship, the practical perception of commitment is generated; moreover, calculative commitment is a promise afer rational and economic calculation (Brown et al., 1995; Gilliland and Bello, 2002). Calculative commitment has the element of continuous relationship, but this commitment has positive relationship with opportunistic behaviors, and also has positive relationship with other provider's cooperation. If other providers can offer better economic conditions, the retails are willing to terminate current cooperation with the current provider (Gilliland and Bello, 2002). Therefore, according to the mentioned, calculative commitment is chosen as a research variable.

3. Research design

3.1. Research Variables and Research Structure

According to literature reviews, the research focuses on eight dimensions: affective commitment, calculative commitment, process transaction cost, social transaction cost, loss interest cost, employee commitment, individual commitment and the intention to stay which construct the research structure as figure 1. The research regarding the intention to stay

applies Hansen et al. (2003) study to divide commitments into affective commitment and calculative commitment to explore the effect of service employee on the intention to stay, and the evaluation questions are referred the scale provided by Allen and Meyer (1990) and Kumar et al. (1994). Jones et al. (2007) offered transaction cost as interfered variable to explore the affect of affective and calculative promises on the relationships among process transaction cost, social transaction cost and loss interest cost. The questions regarding transaction costs are referred by Anderson and Gerbing's (1988). Finally, Jones et al. (2008) and Anderson and Narus (1990) provided the scale regarding organizational commitment, and the scale concerning service loyalty done by Jones et al. (2007) are used as two research dimensions: employee's commitment and individual commitment.

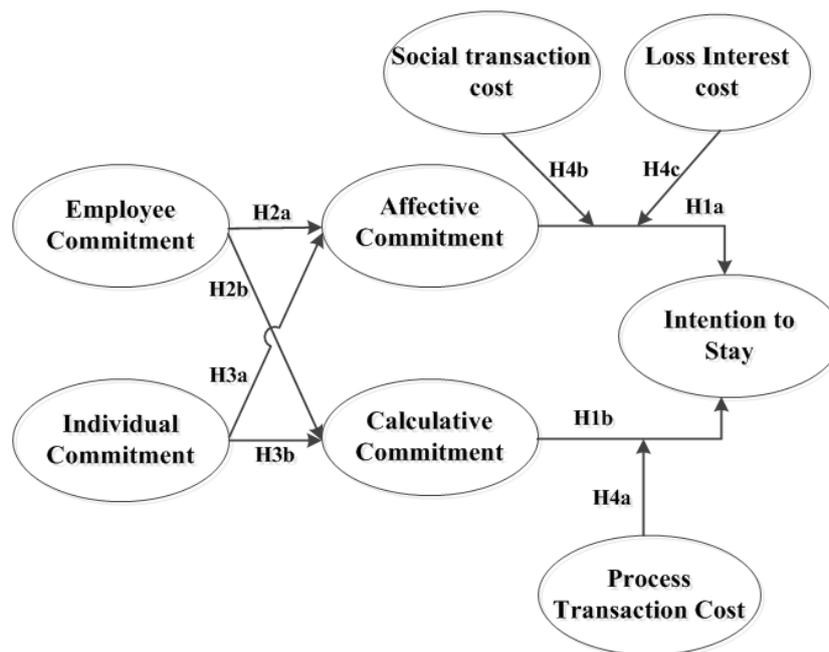


Figure 1: Research structure

According to the above mentioned literature and research structure, the research hypotheses in this study are as Table 1.

H _{1a} : Affective commitment positively influences consumer's intention to stay.
H _{1b} : Calculative commitment positively influences consumer's intention to stay.
H _{2a} : Employee's commitment positively influences affective commitment.
H _{2b} : Employee's commitment positively influences calculative commitment.
H _{3a} : Individual commitment positively influences affective commitment.
H _{3b} : Individual commitment positively influences calculative commitment.
H _{4a} : Process transaction cost interferes in calculative commitment with the relationship of the intention to stay; that is, under high process transaction cost, calculative commitment reduces the influence on the intention to stay.

H _{4b} : Social transaction cost interferes in affective commitment with the relationship of the intention to stay; that is, under high social transaction cost, affective commitment reduces the influence on the intention to stay.
H _{4c} : Loss interest cost interferes in affective commitment with the relationship of the intention to stay; that is, under high loss interest cost, affective commitment reduces the influence on the intention to stay.

Table 1: Research Hypotheses

3.2. Research Sampling and Questionnaire

Consumers who have accepted services provided by insurance agents are chosen as the research sample. By referred to the research samples (220~484 people) chosen by Jones et al. (2008), Jones et al. (2007) and Hansen et al. (2003), this study sent 300 questionnaires to respondents from December 2010 to May 2011. As the questionnaires from 34 respondents were excluded for being incomplete, there were only 266 valid samples, which comprised 88% of all respondents. Participants were asked to respond to three dimensions using a 5-point Likert scale from 1 (agree strongly) to 5 (disagree strongly).

Questionnaire is divided into four parts: the first part explores employee and individual commitments according to organizational scale done by Anderson and Narus (1990) and the scale of service loyalty provided by Jones et al. (2007). The second part examines the relationship between different commitments (including affective and calculative commitments) and the intention to stay according to the scale done by Allen and Meyer (1990) and Kumar et al. (1994). The third part studies the relationships between different commitments (affective and calculative commitments) interfered by transaction cost and the intention to stay upon the scale provided by Anderson and Gerbing (1988). Finally, the fourth part is related to personal data such as gender, age. The research method is applied questionnaires analyzed by multiple Hierarchical Regression analysis via SPSS 12.0.

4. Reserch analysis

According to the analysis of the respondent demographic data, 50.60% of the respondents were female. Nearly 48% of the respondents were less than 30 years old. Around 56% of the participants were unmarried. 38% of the participants were civil servant and teachers. Around 74% of the respondents had bachelor degree. In addition, 46% of the participant's salaries were yearly 1356~3390 (USD). 34.50% of the respondents have contacted with insurance agents less than 4 years.

Cuieford (1965) provided the value evaluation of Cronbach's α . If the value of Cronbach's α is higher than 0.70, then, the reliability is highly accepted (Cronbach's $\alpha \geq 0.70$). In this research, except the dimension of employee's commitment and the intention to stay (Cronbach's $\alpha \leq 0.62$), all items remaining on the questionnaire have a value of Cronbach's alpha greater than .70., including transaction cost (Cronbach's $\alpha \geq 0.70$). Therefore, the reliability of the research is accordance with Cuieford's (1965) evaluation.

The research results are analyzed by multiple Hierarchical Regression analysis via SPSS 12.0, illustrated as follows.

4.1. Affective commitment

Employee commitment to the intention to stay is analyzed by Regression analysis. According to Model 1, employee commitment significantly and positively influences the intention to stay ($R^2=29.80\%$; $F=112.76$; $P\leq 0.001$; $\beta=0.55$). From Model 2--employee commitment to affective commitments, employee commitment has significant and positive effect on affective commitment ($R^2=34.60\%$; $F=140.37$; $P\leq 0.001$; $\beta=0.59$), thus, H_{2a} is supported. From Model 3, employee commitment significantly and positively influences the intention to stay via affective commitment as the medium ($R^2=34\%$; $F=67.98$; employee commitment $\beta=0.40$; $P\leq 0.001$; affective commitment $\beta=0.25$; $P\leq 0.001$). Meanwhile, affective commitment positively and significantly influences consumer's intention to stay; thus, H_{1a} is supported.

As the results of individual commitment to the intention to stay shown in Model 1, individual commitment significantly and positively influence consumer's intention to stay ($R^2=36.40\%$; $F=151.65$; $P\leq 0.001$; $\beta=0.630$). As shown in model 2 individual commitment to affective commitment, individual commitment has significant and positive effect on affective commitment ($R^2=39\%$; $F=169.13$; $P\leq 0.001$; $\beta=0.62$); thus, H_{3a} is supported. As shown in Model 3, via affective commitment as the medium individual commitment has significant and positive effect on consumer's intention to stay, that is, affective commitment positively and significantly influences consumer's intention to stay ($R^2=38.40\%$; $F=10.31$; individual commitment $\beta=0.18$; $P\leq 0.01$; affective commitment $\beta=0.49$, $P\leq 0.001$); thus, affective commitment is an effective medium for individual commitment to consumer's intention to stay.

4.2. Calculative commitments

By employee commitment to the intention to stay in Model 1, employee commitment has significant and positive effect on consumer's intention to stay ($R^2=29.60\%$; $F=112.76$; $P\leq 0.001$; $\beta=0.55$). In Model 2, employee commitment significantly and positively influences calculative commitment ($R^2=6.50\%$; $F=18.31$; $p\leq 0.001$; $\beta=0.25$); thus, H_{2b} is supported. As shown in Model 3, employee commitment via calculative commitment has significant and positive effect on consumer's intention to stay ($R^2=30.60\%$; $F=59.71$; employee and calculative commitment $\beta=0.58$ & $\beta=0.12$, respectively, $P\leq 0.001$); thus, H_{1b} is supported.

According to individual commitment to consumer's intention to stay shown in Model 1, individual commitment has significant and positive effect on consumer's intention to stay ($R^2=36.40\%$; $F=151.65$; $P\leq 0.001$; $\beta=0.63$). Based on individual commitment to calculative commitment in Model 2, individual commitment positively and significantly influences calculative commitment ($R^2=7.90\%$; $F=18.31$; $P\leq 0.001$; $\beta=0.18$); thus, H_{3b} is supported. Individual commitment via calculative commitment does not have positive effect on consumer's intention to stay ($R^2=5.50\%$; $F=5.80$; individual commitment and calculative commitment $\beta=0.43$ & $\beta=0.08$, respectively; $P\leq 0.001$ & $P<0.05$, respectively).

4.3. Transaction cost as interfered variable

The research applies multiple Hierarchical Regression analysis to test interfere variable (Kleimbaum, Kupper & Muller, 1998). In Regression Models, the independent variables in Model 1 including affective commitment, calculative commitment, social transaction cost, loss interest cost and process transition cost respectively and positively influences consumer's intention to stay ($\beta=0.27, \beta=-0.03, \beta=0.13, \beta=0.17, \beta=0.36$, respectively; $P \leq 0.001, P \geq 0.613, P \leq 0.05, P \leq 0.01, P \leq 0.001$, respectively); meanwhile, explanatory variables of this model is 45.60% and $F=43.701 (R^2=0.46; F=46.70)$. After testing Model 2 based on the effect of interaction, H_{4a} , H_{4b} and H_{4c} are rejected, illustrated as Table 2.

Hypotheses	Items	Results
H_{1a}	Affective commitment positively influences consumer's intention to stay.	Supported
H_{1b}	Calculative commitment positively influences consumer's intention to stay.	Supported
H_{2a}	Employee's commitment positively influences affective commitment.	Supported
H_{2b}	Employee's commitment positively influences calculative commitment.	Supported
H_{3a}	Individual commitment positively influences affective commitment.	Supported
H_{3b}	Individual commitment positively influences calculative commitment.	Supported
H_{4a}	Process transaction cost interferes in calculative commitment with the relationship of the intention to stay; that is, under high process transaction cost, calculative commitment reduces the influence on the intention to stay.	Rejected
H_{4b}	Social transaction cost interferes in affective commitment with the relationship of the intention to stay; that is, under high social transaction cost, affective commitment reduces the influence on the intention to stay.	Rejected
H_{4c}	Loss interest cost interferes in affective commitment with the relationship of the intention to stay; that is, under high loss interest cost, affective commitment reduces the influence on the intention to stay.	Rejected

Table 2: The results of Research Hypotheses

5. Conclusions

Through calculative commitment as a medium, employee commitment and individual commitment positively influences consumer's intention to stay. In addition, calculative commitment plays an important role and strengthens influence on consumer's intention to stay. Calculative commitment positively influences consumer's intention to stay. Under high calculative commitment, consumers choose to continue staying with agents because of reciprocal relationships.

Through affective commitment as a medium, employee commitment and individual commitment positively influences consumer's intention to stay. With high affective commitment, consumers are willing to continue staying because of trust between both parties. Employee and individual commitment have significant and positive effect on

calculative and affective commitment, that is, the relationship that consumers have long cooperation with insurance agents positively influences consumer's strong belonging to insurance agents. Therefore, through affective and calculative commitments as mediums, consumers treat insurance agents as cooperative parties or friends or long-term partners. Their relationships influence consumer's intention to stay because of calculative and affective commitments. Moreover, consumers decide to continue services because of insurance agents as friends, even though the service cost is increased.

In sum, employee commitment assists to strengthen organizational commitment. Higher individual commitment is helpful to build consumer's commitment towards organizations. The effect of employee commitment on organizational commitment means that the company should pay attentions on the cultivation of employee commitments. Employees have to recognize consumer's demands and remember their names; further, when providing services, they have commitment and trust for each other.

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EFFICIENCY OF CORPORATE INTERNATIONAL DIVERSIFICATION: EVIDENCE FROM DEVELOPING COUNTRIES

Abstract

During the last two decades corporate international diversification became a widely used growth strategy. However, the majority of scientific researches insist on its value-destroying pattern. Those of them which were based on accounting studies' methodology and used current performance measures are likely to make an incomplete evaluation of corporate performance by accounting either for operating performance or financial (cost of capital) effects of internationalization. The current paper proposes a new approach for estimation of internationalization-performance relationship which is based on economic profit concept. It allows to control simultaneously both operating and financial effects of internationalization on the firms' current performance. The proposed model has been empirically tested on a sample of large companies from one of emerging economies - Russia. The results identify a non-linear U-shape relationship between a degree of internationalization and companies' residual income (economic profit). The relationship is mainly determined by operating performance effects on economic profit while cost of capital has a modest effect. Overall for the majority of companies international diversification refers to decrease in economic profit. The results are compared against the Q-Tobin measure which incorporates expectations about future performance. A joint analysis of current performance (economic profit) and long-term performance (Q-Tobin) allows to expect the internationalization benefits to be realized in future. As an implication of the present research for corporate decision makers it may be stated that at the initial level of international diversification the internationalization decisions should be made with a high degree of caution. There should be a clear internationalization strategy based on definite mechanisms of performance improvement. The prestige and other irrational motives which may lead to the value destruction should be pruned.

Keywords

Corporate international diversification, Corporate performance, Internationalization, Multinational corporations, Residual income

1. Introduction

During the last two decades the level of corporate international diversification (CID) has been significantly growing. As an example in 2003–2006 a number of cross-border M&A deals grew by 40% per annum in manufacturing industries of some of European countries (Coeurdacier et al., 2009). In recent years the companies from emerging markets have also enhanced internationalization strategies, e.g. in China outbound M&A activities have doubled in terms of annual number of deals and increased five times in terms of value in period from 2002 to 2005 (Tan and Ai, 2010). In year 2000–2007 an average growth rate of

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outbound foreign direct investments of Russian companies was about 40% per annum (Plotnikov, 2010).

According to the majority of researches on performance of cross-border diversification the companies get into the internationalization paradox - the scholars demonstrate that the internationalization activities are mainly value-destroying.

Under corporate international diversification (CID) we mean an intensification of international activity of a company in terms of either exporting the products to foreign markets or employing resourced and allocating production units abroad or both. Following Hitt et al. (2006) the terms international diversification, cross-border diversification and internationalization are used in the paper as synonyms.

In fact most part of the researches which are based on accounting studies' methodology use operating performance measures (such as operating profit margin, return on assets or return on equity) and are missing the financial-side effects which are mainly resulted in the change of the cost of capital. These financial effects are mostly related to change in overall level of risks, access to integrated (global) capital markets, tax optimization and change in capital structure (Singh Manohar and Najadmalayeri Ali, 2004). Thus a neglect of these financial effects may lead to an incomplete evaluation of current performance³ of internationalization. Both financial and operational effects should be analysed in order to fix the impact of internationalization on current performance. Meanwhile the current performance of internationalization may not represent its' long-term performance. Thus the current performance of internationalization should be compared to long-term measures such as Q-Tobin or market multiples which incorporate market expectations on future performance of a firm.

This paper contributes to the existing literature by developing a new approach for evaluation of internationalization-performance relationship which is based on a concept of economic profit (residual income). The method allows us to control both operating and financial effects of internationalization. Our second contribution is derived from the application of our original model to empirical identification of internationalization-performance relationship of the firms from the emerging capital markets, mainly Russian companies, which still remained unexplored as compared to the developed markets.

The paper is structured as follows: in the next section the theoretical background is summarized on the basis of existing researches and the hypotheses are formulated. The data and the methods are explained in section three. In section four we discuss the empirical results. Finally, the overall conclusions and policy implications are presented.

³ Under current performance we mean the results of a firm in a particular time period, for example for a particular year

2. Theoretical background and hypotheses

2.2. Research approach

The internationalization-performance relationship is typically studied in two paradigms⁴: event studies and accounting studies. While the first is based on the analysis of corporate performance change within a time window around a cross-border M&A deal, the second approach is based on identification of relationship between corporate performance (typically accounting-based measures) and a degree of internationalization of business (DOI). One may find a thorough review of research literature of both event-based and accounting-based internationalization studies in the papers of Bruener (2004) or Hitt et al. (2006).

The current research is based on the approach of regression analysis of influence of degree of internationalization on corporate performance measures. The existing researches differ a lot by the use of both performance indicators and measures of degree of internationalization:

- depending on the choice of measure of DOI it is possible to control different internationalization patterns. Usually international diversification is classified into two classes – diversification of assets and diversification of markets. The most commonly used measures of these types of CID are foreign-assets-to-total-assets (FATA) and foreign-sales-to-total-sales (FSTS) ratios correspondently. In opposite to event-studies approach the use of FATA measure allows to analyze not only non-organic foreign growth (cross-border M&As) but also foreign greenfield investments;
- a use of different corporate performance indicators also allows to study different types of effects of internationalization in different time horizons. Typically researches use the following two types of corporate performance measures:
 - 1) The first group of measures represents the current corporate performance during a particular period of time (usually 1 year) but does not incorporate expectations of potential efficiency changes in the future (usually benefits from internationalization are fully realized in the period of several years). The group of these measures consists of operational (revenue, operating cash flow, EBIT-based measures (EBIT margin, ROS, ROE, ROA, etc.), others) and financial performance measures (WACC and other cost-of-capital related measures) which are studied separately. The following papers represent this class of studies: Qian and Li (2002), Guler et al. (2003), Moeller and Schlingemann (2004), Lu and Beamish (2004), Contractor et al. (2007), Bobillo et al. (2010), Rugman and Chang (2010), Singh and Nejadmalayeri (2004), Joliet and Hubner (2006);
 - 2) The second group of measures incorporates expectations of the future corporate performance by combining accounting measures with market-based metrics in different multiples (Tobin's Q, PE, market-to-book ratio, others; see Bodnar et al. (2003), Chang and Wang (2007), Rugman and Chang (2010)).

The weakness of the first group of measures is that they do not simultaneously count for operational and financial efficiency effects of internationalization. In fact the change in operational efficiency measures should be compared to the change in opportunity costs

⁴ There exists the third paradigm of case studies analysis, but it remains a rather niche study-field.

measured by the change in the cost of capital. This paper proposes a new approach for solving the problem of a simultaneous analysis of operational and financial efficiency change related to corporate international diversification. The current model is based on the economic profit concept. Since economic profit comprises the cost of capital, which represents the risks associated with a firm and its internationalization decisions, it is an appropriate measure of **strategic performance** of a firm. The economic profit or residual income is measured as follows:

$$RI_{it} = (ROCE_{it} - WACC_{it}) \cdot CE_{it} \quad (1)$$

where RI is the measure of economic profit of company i in period t , $ROCE$ – return on capital employed, $WACC$ - weighted average cost of capital, CE – amount of capital employed.

As an economic profit measure for estimation of internationalization-performance relationship the ratio of residual income to capital employed may be used. Thus, both $ROCE$ and $WACC$ as functions of the degree of internationalization and other control variables should be estimated.

2.2. Hypotheses

Based on existing studies as well as our analysis of internationalization processes in Russia we have formulated several research hypotheses for a sample of Russian companies.

2.2.1. Hypotheses for ROCE-DOI relationship

The majority of internationalization-performance researches state for a non-linear pattern of relationship between DOI and operational efficiency measures. Lu and Beamish (2004) identified the most general pattern of this relationship demonstrated by horizontal S-shape curve which was also supported by Bobillo et al. (2010), Rugman and Chang (2010). The S-shape curve consists of 3 sequential intervals:

- 1) at a low level of international diversification the operating performance is decreasing with an increase in DOI since internationalization-related costs (learning costs, cost of coordination and control of abroad divisions, other transaction costs) are too high in comparison with a low marginal increase in efficiency and growth of abroad sales;
- 2) at a medium level of internationalization the performance is supposed to increase due to significant benefits (economy of scale and scope, diversification of country risks, access to foreign knowledge and cheaper resources, increase of market power, etc.) which are higher than transaction costs;
- 3) at a high level of DOI the performance may start descending again due to the unmanageable international complexity of organizations (over-internationalization stage).

For the developed countries the most typical result of estimation of the relationship is a horizontal S-shape curve, but there are some studies which also identify a U-shape curve⁵

⁵ For instance see Capar and Kotabe (2003), Ruigrok and Wagner (2003).

(which represents only the first and the second stages of the S-shape curve) and an inverted U-shape curve⁶ (which represents only the second and the third stages of the S-shape curve). For the emerging markets (India) a U-shaped relationship has been identified by Contractor et al. (2007). It is presumed that the companies from the emerging markets typically do not reach such degree of complexity related to an over-internationalization stage when further internationalization becomes value destroying.

Hypothesis 1.1: The relationship between ROCE and DOI is non-linear and follows an U-shape pattern for Russian companies

2.2.2. Hypotheses for WACC-DOI relationship

Singh and Nejadmalayeri (2004) have identified an increase of liabilities in capital structure related to corporate internationalization. The fact is motivated by a corresponding increase of debt supply on capital market which is driven by diminishing bankruptcy risks of internationalizing firms due to overall risk diversification. But conversely there exist other studies that state for a downturn in debt supply related to corporate internationalization due to the following factors (see e.g. Doukas and Pantzalis, 2003):

- a) typically internationalization is associated with higher growth rates and a growing complexity of organizational design of a business both of which increase agency costs of debt holders;
- b) amount of intangible assets are likely to increase with international diversification of business which implied additional risks to debtholders as these assets cannot be monetized in case of bankruptcy.

Since there is no theoretical base for hypothesizing a prevailing of one effect above another as a hull hypothesis we assume that the effects compensate each other and capital structure is not supposed to change due to internationalization.

Hypothesis 2.1: A combination of debt and equity in capital structure does not depend on DOI for a sample of Russian companies.

Corporate international diversification influences cost of equity through the following three factors:

- a) change in level of risks: there may exist a non-linear relationship between DOI and level of risks to shareholders due to an addition of new internationalization-specific risks on initial stage of international diversification, meanwhile on a later stages of CID one could expect a decrease of shareholders' risks due to their diversification;
- b) rise of shareholders' agency costs: it is supposed that with growth of DOI the costs of monitoring and controlling company's management also increase;
- c) change in capital structure: different levers are described in above in paragraph related to Hypotheses 2.1.

Singh and Nejadmalayeri (2004) state for a higher risk price for shareholder determined by beta coefficient for MNCs.

⁶ For instance see Hitt et al. (1997).

Hypothesis 2.2: Cost of equity increase with international diversification. There may exist a non-linear relationship of U-shape form between cost of equity and DOI for a sample of internationalized Russian companies

The most significant debt-specific factors are as follows:

- a) change in debt maturity: as it was identified by Singh and Nejadmalayeri (2004) that MNCs typically raise a longer-term debt than domestic firms do. It is thus resulted in higher cost of debt;
- b) change in efficient tax rate related to a move of profit centers in other countries: this factor directly influences the after tax cost of debt.

Hypothesis 2.3: Cost of debt is growing with an increase in DOI for a sample of Russian companies.

2.2.3. Hypotheses for Q-Tobin – DOI relationship

The Q-Tobin represents expectations of shareholders regarding future company's performance (mostly strategic investors, who are focused on long-term development of a firm). Given that internationalization strategies are used widely, we can expect that they create value in long term even if a short-term (current) internationalization effects may be negative. This may be explained by several factors such as a long-term benefits which could not be gained in short term (benefits from access to new technologies and R&D results), or short-term internationalization costs may be considered as investments in maintaining market position in long-term (for example a purchase of an abroad company way lower current performance but make a company better-off comparing to a case when a competitor makes this purchase), etc.

Hypothesis 3.1: Q-Tobin increases with increase of degree of internationalization for a sample of Russian companies. With low current performance related to internationalization Q-Tobin would be also lower.

3. The methods

3.1. The sample

The proposed research framework is applied on a sample of Russian companies. We have collected the data of 50 Russian companies which included:

- 40 internationalized companies which have made at least one cross-border acquisition in the period from 2000 to 2010;
- 10 domestic companies with a zero internationalization level which are included in the list of 200 Russian companies with the highest capitalization.

All chosen companies are public and disclose all the key information which should be used in the current research. The data is derived from Bloomberg database. The data has been collected for a time span from year 2005 to year 2010. Overall we have an unbalanced panel

of 183 observations. Moreover there exist some observations with missing values for some of the variables. Descriptive statistics for key variables in the dataset is depicted in Table 1.

Variable	Description	Obs	Mean	S. D.	Min	Max
<i>Efficiency measures</i>						
ROCE	Return on capital employed (%)	178	24,16	18,53	-19,58	108,44
WACC	Weighted aver. cost of cap. (%)	183	9,32	3,19	1,33	20,11
<i>Internationalization measures (DOI)</i>						
fsts	Foreign sales to total sales	183	0,32	0,32	0,00	0,98
fata	Foreign assets to total assets	103	0,10	0,19	0,00	1,00

Table 1: Key variable's description and statistics for the sample

3.2. Modeling procedures

We do separate estimations of ROCE, WACC and Q-Tobin's equations on panel data for years 2005-2010. We employ GLS estimates under assumption of random effects. A Hausman test is also used in order to test an endogeneity problem in panel data regressions. We also test for non-linearity and other formulated hypotheses. RI is calculated analytically based on the estimations of ROCE and WACC.

As for DOI the FSTS measure is used. We do not employ into the regressions the FATA measure because of its low availability. Nevertheless, due to a sample selection procedure where we have chosen the companies which conducted at least one cross-border M&A in the last decade, both assets and market international diversification are analyzed.

An equation for ROCE has the following form:

$$ROCE = X \cdot \delta + \alpha_1 \cdot fsts + \alpha_2 \cdot fsts^2 + \alpha_3 \cdot fsts^3 + \varphi \quad (2)$$

where X is a matrix of the following control variables: firm size (measured by logarithm of sales), product diversification (measured by Herfindahl-Hirschman Index calculated on the basis of product segmentation disclosed by firms in their financial statements), book value of intangible assets normalized by total amount of assets, managerial agency costs (inverse of assets turnover ratio) and composite variables of DOI and product diversification as well as DOI and intangible assets ratio.

For testing the hypothesis 2.1-2.3 an equation for WACC has been decomposed into three parts: 1) financial leverage (share of debt in the capital employed), 2) cost of debt and 3) cost of common equity:

$$WACC(fsts) = \frac{D}{D+E}(fsts) \cdot CoD(fsts) + (1 - \frac{D}{D+E}(fsts)) \cdot CoCE(fsts) \quad (3)$$

where D states for amount of debt, E – common equity, CoD - cost of debt , CoCE - cost of common equity. A share of preferred equity in capital structure is extremely low in the

studied sample and constitutes no more than 0.1% of capital employed and is not taken into analyses in the present research.

Thus according to the defined approach we estimate the following equations (4) – (6):

$$\begin{aligned} Debt_to_assets = & \beta_0 + \beta_1 \cdot fsts + \beta_2 \cdot fsts^2 + \beta_3 \cdot fsts^3 + \beta_4 \cdot ROE3 + \\ & + \beta_5 \cdot growth3 + \beta_6 \cdot \ln_sales + \beta_7 \cdot dummies + \varepsilon \end{aligned} \quad (4)$$

$$\begin{aligned} CoD = & \varphi_0 + \varphi_1 \cdot fsts + \varphi_2 \cdot fsts^2 + \varphi_3 \cdot fsts^3 + \varphi_4 \cdot ROE3 + \\ & + \varphi_5 \cdot growth3 + \varphi_6 \cdot \ln_sales + \varphi_7 \cdot debt_to_assets + \varphi_8 \cdot dummies + \varepsilon \end{aligned} \quad (5)$$

$$\begin{aligned} CoCE = & \gamma_0 + \gamma_1 \cdot fsts + \gamma_2 \cdot fsts^2 + \gamma_3 \cdot fsts^3 + \gamma_4 \cdot ROE3 + \\ & + \gamma_5 \cdot growth3 + \gamma_6 \cdot \ln_sales + \gamma_7 \cdot debt_to_assets + \gamma_8 \cdot dummies + \varepsilon \end{aligned} \quad (6)$$

where *dummies* states for dummy variables representing industry of a firm and profitability shift related to crises years 2008 and 2009.

For testing the hypothesis 3.1 we estimate the following equation:

$$Tobin's_Q = Y \cdot \delta + \alpha_1 \cdot fsts + \alpha_2 \cdot fsts^2 + \alpha_3 \cdot fsts^3 + \varphi \quad (7)$$

where *Y* is a matrix of control variables, which include: firm size (*ln_sales*), product diversification variable (*prod_divn_hhi*), proxy for agency costs measure (*asset_turnover*), measure for book value of intangible assets (*intang_to_tot_assets*), composite variables of DOI and product diversification as well as DOI and intangible assets ratio (*diverse* and *intasssales_to_fsts* correspondently), debt to assets ratio (*Debt_to_Assets*), three year average return to equity (ROE3), EBIT margin in current year (*Ebit_margin*), three year average sales growth rate (*Growth3*), dummy variables for industries using SIC and for a control of crisis period 2008–2009. The chosen variables are key variables, which influence Q-Tobin of internationalizing companies (for a detailed analysis of variables choice see Lu and Beamish, 2004; Chang and Wang, 2007).

4. Findings

4.1. Testing the ROCE to DOI relationship

In order to define a proper functional form of the ROCE-DOI relationship all variables have been initially included in the equation (2):

- To measure a direct internationalization impact on performance the cubic polynomial function components has been employed (*fsts*, *fsts*², *fsts*³). It allows to test the formulated hypothesis of non-linearity of internationalization impact;

- To test two other hypotheses of an influence of product diversification and intangible assets on ROCE-DOI relationship two additional variables were used: composite variables of DOI and product diversification as well as DOI and intangible assets ratio.

The results of estimation are represented in Chart 1. Our main findings are as follows:

- We found out that the ROCE-DOI relationship follows a U-shape pattern (see Chart 1). At the early stage of internationalization (when the share of foreign sales is in the interval between 0% and approximately 50%) cross-border diversification significantly diminishes the return on capital employed. At the later stages of internationalization (when the share of foreign sales exceeds half of total sales) a sharp increase in profitability has been identified. As it is shown the initial drop in efficiency is compensated by its subsequent growth only at the level of absolute internationalization (FSTS > 90%). The significant drop in ROCE at the early stage of internationalization of Russian companies may be explained by both strategic motives (which presume return in the long run, e.g. a motive of acquisition of innovative technologies or new knowledge) and at the same time by possible irrationality of managerial behavior (such phenomenon as managerialism and hubris are studied in Seth et al. (2000)).

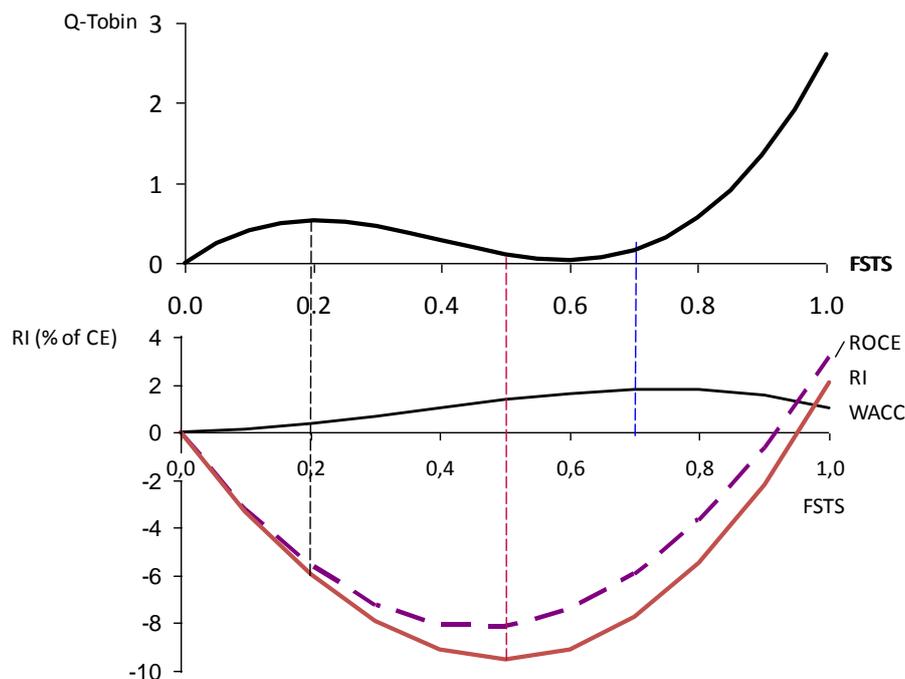


Chart 1: Q-Tobin - Internationalization relationship compared to relationship of internationalization and current performance (RI)

4.2. Testing the WACC to DOI relationship

According to the methodology described in the above section a separate estimation of influence of DOI on capital structure, cost of debt and cost of common capital has been carried out. The results are as follows (see also Chart 2):

- We identified no significant influence of DOI on capital structure (i.e. the choice between common equity and debt; these results of estimates for eq. 4 are not depicted in the paper);
- Cost of debt positively and significantly depend on DOI. The fact is described by the change in the time structure of debt – with an advancement of international diversification companies launch longer term projects which require external financing for longer periods of time. As it is commonly known longer term financing is typically associated with higher required return to debt;
- For the cost of common equity (CoCE) we found a non-linear relationship form. This form may be described by the proposition that at low degrees of internationalization shareholders consider CID as an addition of new internationalization-specific risks while at the later stages of internationalization they regard a firm as a well diversified portfolio of businesses in different countries, characterized by comparably lower level of risks;
- An estimation of weighted average cost of capital is computed analytically with a use of the given capital structure of each firm in each year (see Chart 2). We can conclude that CID typically increases the cost of capital employed (if compare to domestic firms).

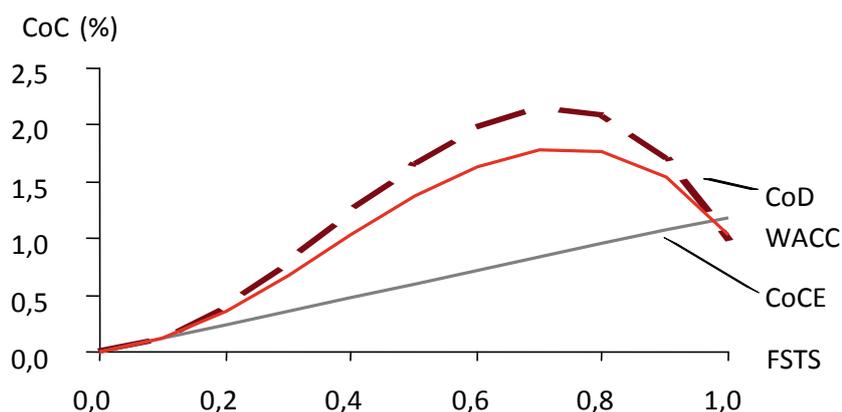


Chart 2: ROCE to DOI relationship: a U-shape curve

4.3. Estimation of economic profit

In present research the current performance measure is defined by an economic profit spread (or residual income spread) which equals to a difference between return on capital employed (ROCE) and weighted average cost of capital (WACC), see Chart 1. The results show that residual income ratio mainly follows the ROCE pattern. Influence of WACC on the economic profit margin is significant but rather low. The overall internationalization-performance relationship of Russian companies seems to follow a U-shape curve with a rather high variance in performance.

4.4. Estimation of Q-Tobin – DOI relationship

The estimation of Q-Tobin - internationalization relationship is depicted on Chart 1⁷. It is shown that the relationship follows a horizontal S-shape curve, which consists of 3 stages:

- Stage 1 – start of internationalization (DOI is between 0 and 0.2). On this stage there may appear a value creation due to low dependence of the whole business on international affairs but potentially significant benefits (access to technology, markets which are similar and close to domestic, etc.);
- Stage 2 – adaptation to internationalization (DOI is higher than 0.2 and lower than 0.7). The business suffers from increasing transaction costs and a need for transformation in order to adapt to new international structure;
- Stage 3 – matured multinational (DOI higher than 0.7). The business is well adapted to the international structure, it gains the whole number of benefits, but not tackles with the problem of over complexity (where efficiency starts decreasing).

In comparison of the Q-Tobin – DOI and RI – DOI results it should be stated that on overall the internationalization strategies are expected to create value in long term regardless to a drop in current performance of a firm. Thus a drop in current performance should be mostly explained not by irrational motives of management, but mostly by strategic aspects which presume competitive advantages in long run.

5. Conclusions and policy implications

This paper contributes to the internationalization-performance literature by proposing a new approach for measuring corporate performance related to internationalization which is based on economic profit concept. This new method simultaneously accounts for a change in profitability (measured as return on capital employed) and opportunity costs (measured by weighted average cost of capital) related to a level of cross-border diversification. The methodology of empirical estimation of internationalization efficiency has also been developed.

The proposed methodology has been used for estimation of efficiency of internationalization strategies of large Russian companies. It has been shown that internationalization-performance relationship follows a U-shape curve (the finding is consistent with the results of Contractor et al. (2007) derived for another emerging market - India). At the initial stage of international diversification corporate performance declines while at further stages of diversification it grows up. This form of regularity is driven mainly by companies' operating performance (return on capital), while opportunity costs (cost of capital) changes also in a non-linear pattern but with a lower effect. Regardless a drop in current performance related to internationalization the stock market expects that in long run the internationally diversified firm could create higher value than the local peers.

As an implication of the present research for corporate decision makers it may be stated that at the initial level of international diversification the internationalization decisions should be

⁷ Chart 1 represents the Q-Tobin – DOI relationship for an average degree of product diversification.

made with a high degree of caution. The prestige and other irrational motives which may lead to the value destruction should be pruned. During the analysis of internationalization efficiency not only operational, but also financial effects should be counted. Companies should also be ready for a probable initial decline in operating performance motivated by an excess of internationalization costs over corresponding benefits.

As for long run internationalization strategy on average we state the following two are likely to be the most sustainable: a) *local focus strategy* with low degree of internationalization (get missing technology or go to nearest well-known abroad markets) and proposition of well customized local products, b) *fully internationalization strategy* with lower level of country-specific customization, but higher operating efficiency.

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THE PROSPECTS OF INTERNATIONAL ACQUISITIONS IN CAR INDUSTRY DURING THE GLOBAL ECONOMIC CRISIS - THE CASE OF GEELY VOLVO

Abstract

Significant technological, social and economic changes on the global level marked the beginning of the 21st century. Growing importance of Chinese economy stands out as one of the most important among these changes. Accelerated economic development of China was first based on FDI inflow and the export of low-cost less technology intensive products. However, a gradual alternation to Chinese economic policy and the growth of outward FDI followed by a global breakthrough of some Chinese companies operating in technology intensive industries (Huawei, Lenovo, Mindrey, Haier etc.) has been marked in the past few years. Further economic development of China will to a large depend on the positioning of Chinese car manufacturers. In this paper the stress will be put on high technology intensity in car industry, on its global character, high concentration within the industry and on market saturation in developed countries due to global economic crises. Basic characteristics of automotive industry and its development will be considered regarding prolonged economic crisis. Current local character of Chinese car manufacturers and its going global prospects will be observed. In order to become global players Chinese car manufacturers could implement the acquisition strategy of some key competitor from developed countries. Chinese car companies aimed at relatively small targets in the previous period because they were inexperienced in acquisitions and restructuring management and tended to decrease risks. The last and the most important is the acquisition of Swedish Volvo by Chinese Geely. These are the companies significantly differing in the level of technology, corporate and national culture, brand perception and geographic orientation of business operations. Potential risks that follow these differences as well as potential synergetic effects, supposing that the acquisition process is properly managed, will be considered in the paper.

Keywords

Acquisitions, Auto industry, China, Synergy

1. Introduction

The globalization process, having been intensified over the last two decades, has had profound impact on the international business environment. One of the most important results of this process is the integration of national economies into global economy. According to some research Chinese economy was the fastest globalized national economy between 1975 and 2000 (Dreher, 2006, pp. 1091–1110). Deregulation of Chinese economy and integration into global economy set the bases for its strong economic growth. Despite the poor starting point, China has become the second world economy for only two decades. China GDP has shot up in the past two decades and was multiplied more than eleven times.

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Likewise, GDP per capita was multiplied 9.5 times. Some researchers believe that without structural reforms and stimulation of domestic demand China will very soon hit the peak of its economic growth. Global economic crises and falling demand for Chinese products in their main export markets (i.e. European Union) support these ideas. The World Bank's latest research expects Chinese economy to cool off, but in spite of the slowdown it forecasts strong GDP growth rates, compared with developed economies (World Bank, 2012, p. 81).

China's development in the last two decades has been based on strong FDI³ inflow, which rose from USD 4 billion to USD 185 billion. Big MNCs⁴, usually from developed economies, have used its subsidiaries in China as export-platform FDIs. Strong presence of export-oriented MNCs and deregulation of economic policy have allowed Chinese companies go global. The first wave of the internalization comprised work intensive industries. Nevertheless, in the past few years a number of Chinese companies performing in high technology industries have become global competitors (Lenovo, Huawei, Haier, ZTC, Mindray etc). These companies are still exception rather than the rule, and it seems clear that more players from China will enter the global field in the years to come.

Due to large R&D investments and high market saturation in the global auto industry market, new entrants cannot easily penetrate it. Today's Chinese car industry is not globally competitive, though some companies strive to internationalize their business operations. Several Chinese car companies made international acquisitions to achieve this goal. The last and the most important has been the acquisition of Swedish *Volvo* by Chinese *Geely*. This acquisition is estimated to be very risky due to its size, investor's lack of experience in acquisition management, and the differences between national and corporate culture of the investor and the target.

This paper consists of three parts. The first part offers theoretical explanation of horizontal acquisitions. The motives behind the acquisitions of enterprises operating in the same industry will be examined. The second part of the paper gives a review of the present situation in auto industry and its future prospects. The focus will be on the market position and the future role of Chinese car manufacturers. The third part of this paper offers the analysis of the motives behind *Geely's* acquisition of *Volvo*, potential benefits and risks involved in it.

2. The role of cross border acquisitions in contemporary business environment

Before the global economic crisis international acquisitions recorded constant, though unsteady growth. In this period both the number and the value of international acquisitions increased. In 2007 the value of international acquisitions was more than USD 1,000 billion and they reached the historic peak, while in the next two years they suffered a sudden downturn, and in 2009 their value was USD 250 billion. In 2010 and 2011 an appreciable growth of international acquisitions was recorded, though its value accounted for something

³ Foreign Direct Investments

⁴ Multinational Companies

more than the half of its historic peak (UNCTAD, 2012, pp. 177–180). The dynamics of international acquisitions varied from industry to industry. Its dynamics in car industry did not entirely correspond to global economic trends.

	<i>Value of transactions</i>	<i>Number of transactions</i>
2005	8.524	78
2006	7.475	84
2007	3.099	86
2008	11.608	95
2009	8.753	74
2010	7.488	84
2011	5.370	87

Table 1: The value of international acquisitions in car industry in million USD (UNCTAD, 2012, p. 185)

According to Table 1 international acquisitions in car industry reached its peak exactly in the crisis period. These relatively unexpected trends regarding the global economic trends must be observed through the comparison between pre-crisis and post-crisis structure of the industry. This is to say that a considerably high market concentration in auto industry before the crisis did not leave much room for further acquisitions. Some car manufacturers were, however, severely hit by the crisis and had to seek restructuring through bankruptcy, while the others had to divest some of its operations. Car companies that successfully survived the first wave of the crisis (*Volkswagen and Fiat*) and companies from emerging markets (*Geely*) seized the opportunity stemming from the competitors' unfavorable position and took over some or all of their operations. In the last two decades, in the Fifth Wave mergers and acquisitions, the number of horizontal acquisitions has rapidly increased. In this period companies tended to utilize the positive economic trends in the West as well as deregulation of world economy (Gaughan, 2007, p. 59). The Fifth Wave acquisitions are to a large the consequence of the MNCs' strategies of focusing on the cornerstone of competitive advantage and divest from highly diversified business operations. This applies to car industry too.

In business economics acquisitions have been analyzed from different aspects with the aim of identifying the motives behind them, effects they produce, the causes of success or failure, and how to advance the acquisition process itself. In spite of extensive theoretical and practical researches into this field failure rate of acquisitions remains high. Most analyses show that more than 50% of acquisitions fail and the often quoted research carried out by KPMG shows that on average 53% of acquisitions is value destroying, 30% have no effects on value, and only 13% of acquisitions create value (Kelly, Cook and Spitzer, 1998, p. 2). The most recent research in this field shows that the success rate of acquisitions is much higher if investors from emerging markets acquire targets from developed markets. This is because intangible resources possessed by companies from developed markets complement country specific advantage of emerging markets multinationals (Gubi, Aulaks, Ray, Sarkar and Chittoor, 2009, pp. 397–418). Considering the high failure rate of acquisitions it is necessary to classify them according to their goals: (1) acquisitions by which companies try to advance its business performance without changing the business model (2) acquisitions by which companies try to reinvent their business model (Christensen, Alton, Rising and Waldeck, 2011, pp. 49–57). Through the first type of acquisitions companies try to maintain

their strategic position and it is more frequent than the second one. Investors often have high expectations about these acquisitions and the premiums paid for them can be very high. On the other hand, less frequently the goal behind acquisition is to reinvent the existing business model and to create a new strategic position. Acquisitions of targets from developed markets by investors from emerging markets fall under the second type of acquisitions. The motive behind all acquisitions is to achieve synergy. Synergy can be achieved via operational and financial synergy. The effects of operational synergy through acquisition will not be produced equally fast and do not have equal prospects of success (Cullinan, Le Roux and Weddigen, 2004, pp. 97–104). Figure 1 shows operational synergy map that can be represented in the form of concentric circles.

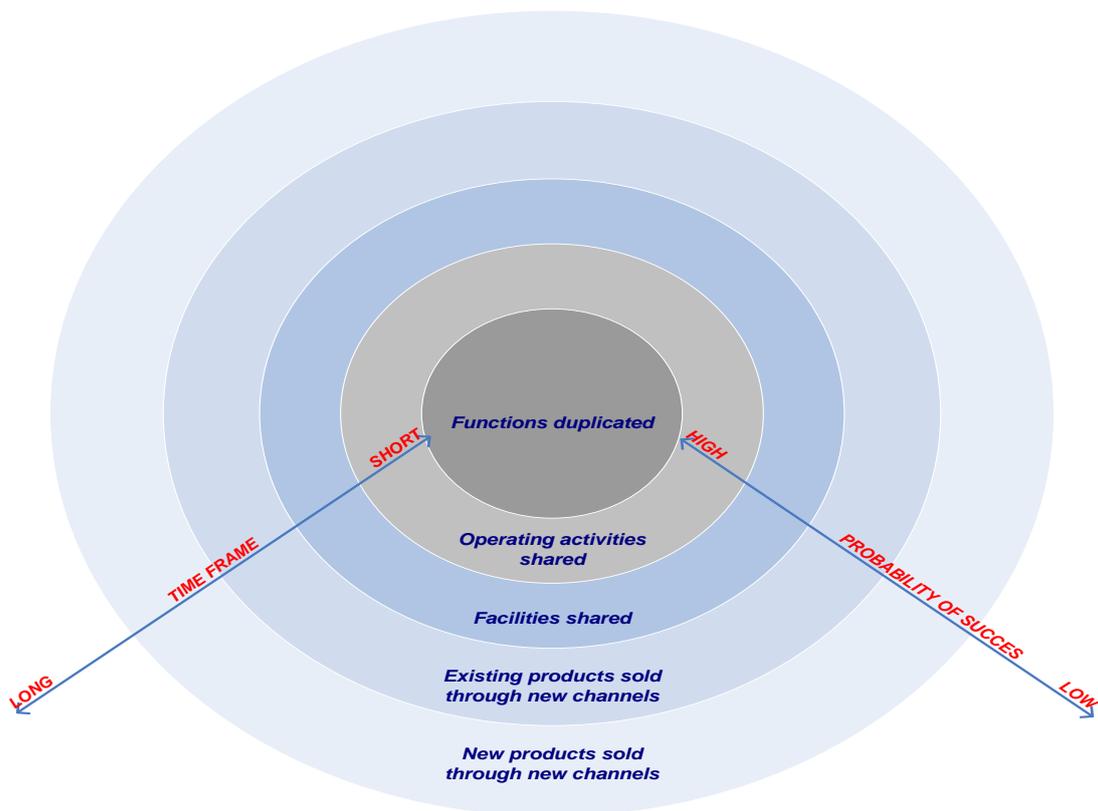


Figure 1: Operational synergy map (Cullinan, Le Roux and Weddigen, 2004, pp. 97–104)

During Due Dilligence process, but also in post-acquisition period, cost reduction is investor's top priority. There are several reasons for this. Cost reductions can be quiet easily identified and quantified, and most often they can be easily achieved in short term. Rapidly achieved considerable cost reduction contributes to so called "early victories". "Early victories" must be promoted among the stakeholders, especially among the investors and creditors (Habeck, Kroger and Tram, 2000, p. 68). Cost reductions especially gain in importance in consolidated industries such as car industry. The main characteristic of consolidated industries is overcapacity. One of the first measures investors in these industries take after acquisition is elimination of surplus capacities. Investors thus eliminate fixed costs, and consequently decrease pressure on prices and increase profit margins (Sudarsanam, 2003, p. 106). This is a one-time cost reduction. These measures concern both production and nonproduction employees and entire production facilities. Acquisitions in car industry often include these measures, primarily closing production facilities in countries with expensive labor force.

Elimination of overcapacity is closely related to economy of scale. Economy of scale can be achieved in almost any area starting from R&D, production, distribution channels and advertising. It gains in importance in industries with high fixed costs, such as car industry. Building competitive advantage only through economies of scale is a high-risk strategy in the world of hypercompetition and constant technology innovations.

Apart from economies of scale, economies of scope can contribute to cost reduction too. Economy of scope is the use of available resources not only in current business operations but also in similar business operations. In auto industry economy of scope can be achieved through usage of a flexible production line. Economy of scope is, however, expected to be the most effective in R&D. Considering that 88% of innovations do not achieve expected investment return, and a large number of them are soon after its implementation successfully imitated by competition, companies tend to apply their innovations in production of as many products as possible. *Honda*, for example, applied internal combustion engine innovations in production of motorcycles, automobiles, but also lawn mowers and artificial grass cleaners (Ireland, Hoskisson and Hit, 2009, p. 188). Acquisitions offer new opportunities to achieve economy of scope, though it is quite hard to identify and quantify them.

In addition to cost reduction, the motive behind many horizontal acquisitions is revenue above the simple sum of investor and target's revenues. In Due Diligence investors pay little regard to revenue increase opportunities. Revenue-based synergy can be achieved through complementary products, reputation spillover, usage of the existing channels for new products, development of new products and distribution channels etc. Revenue-based operational synergy involves considerable risks, and it can be achieved in the long run (see Figure 1). Revenue-based operational synergy through acquisitions within consolidated industries is extremely hard to achieve. Many companies, therefore, must seek growth opportunities in geographic segments with low market saturation.

Another motive behind horizontal acquisitions can be financial synergy, which contributes to lower cost of capital. If there is not a high level of correlation between the cash flow of investor and target, creditors can perceive the acquisition as an instrument of financial risk management. Possibilities of cash flow diversification are fairly limited because car industry is globalized and the manufacturers face hypercompetition. Cost of capital can, however, be lowered via acquisitions of companies that generate the majority of its cash flow in different markets or by different segments. Case study presented below proves this statement.

Investors sometimes make acquisitions to reinvent their business models. By this investors try to set a new long-term growth basis, and thus advance its competitive position (Christensen, Alton, Rising and Waldeck, 2011, pp. 49–57). These acquisitions are made if investors lack capacities to keep up with technology innovations or beat off severe competition. When investors estimate that the present production portfolio or market portfolio cannot provide for long-term growth, acquisition of a company possessing the lacking resources is necessary. This can mean penetration into new geographic markets, new market segments or launch of an entirely new product. This radical change of the existing business model made through acquisition involves considerable risks. Identification of the resources essential for business model reinvention, that is to say identification of target, is of

crucial importance. Integration process, which usually requires changes both in target and investor's organization structure, must be carefully planned and implemented. Evaluation of target via quantification of the effects acquisition brings about is quite challenging. *Geely's* acquisition of *Volvo* is a typical example of an acquisition made to reinvent investor's business model.

3. The development of global auto industry and the prospects of Chinese companies

Car manufacturers have been severely affected by the global economic crises, although not equally in all markets. The biggest drop in production happened in the USA. The production of all vehicles down fell from 10,780 thousand in 2007 to 5,709 thousand units in 2009 (OICA, 2012). The falling demand and overcapacity in the industry created huge problems for the "Big three" from Detroit. In June 2009 General Motors filed for bankruptcy protection and the USA government acquired 60% of its shares. In the same year Chrysler filed for bankruptcy protection and after several investments in it, Fiat gradually became major shareholder of the company in July 2011. Ford evaded the bankruptcy but had to restructure business operations and sell some brands and affiliates. The crises very soon overflowed to the other side of the Atlantic and hit European markets. The production of vehicles in Europe dropped from 22,856 thousand in 2007 to 17,009 thousand units in 2009 (OICA, 2012). European new passenger car registration fell by 7.8% to 14,713 thousand units in 2008, recording the sharpest decline since 1993 (ACEA, 2009). The negative trend continued in 2009 and new passenger car registration dropped by 1.6% comparing to previous years, despite significant financial support by governments. The sharp decrease in demand puts a lot of pressure on the companies to sell off business units and lay off workforce.

The crisis has affected the emerging auto markets as well, though to a lesser extent than it struck car manufacturers from developed countries. Car industry experts forecast that the sale in both developing and developed countries will equalize and reach the level of 35 million units. Growing demand in emerging markets has attracted significant investments made by both developed and domestic companies. This increased the production, especially in China. Despite the crises car production increased from 8,886 thousand units in 2007 up to 18,419 thousand units in 2011, which brought China to the very top of the list of global auto producers (OICA, 2012). China owes the lion share of its car production to foreign subsidiaries, although domestic companies have made huge steps forward.

Today's new business environment created global expansion opportunities for Chinese car companies. Overcapacity in the industry, financial problems of some important competitors and global focus on clean energy work in Chinese manufacturers' favor. If China's companies manage to exploit these trends, they will be able to go global and challenge the industry leaders. Consolidation on domestic and global markets is relevant to China's auto industry. The fact that there are about 150 domestic car companies in China made central and regional governments put soft pressure on the companies to consolidate their operations. Consequently, there were two China-China acquisitions on the list of top 10 deals – vehicle manufacturers in 2011, worth more than USD 4.8 billion (PriceWaterHouseCoopers, 2012, p. 14). Car industry overcapacity on the global market is the consequence of falling demand in developed markets and huge improper investments in the pre-crisis period. In the KPMG

survey some 41.5% of respondents consider the USA to be overbuilt market, even though the USA manufacturers have reduced capacity in the last four years by more than 1 million vehicles. Respondents believe that overcapacity of German and Japanese markets is between 11% and 20% (KPMG, 2012, p.46). The overcapacity is a precondition for the wave of China’s cross border acquisitions in the industry. By acquiring the assets of a distressed but well known international manufacturer, China’s auto companies are hoping to significantly accelerate their development and market penetrations (Russo, Tse, Ke and Peng, 2009). The structure of global auto industry in the future will depend on the technology innovation in construction of hybrid or electric cars and their commercialization. The development of green vehicles and consumers’ favorable response to them is important to every country, but most of all to China. Significant progress in this field will help China decrease its dependence on foreign oil, with wobbly prices, and reduce pollution and greenhouse emissions, as some of the main obstacles to its medium term strong growth. According to China’s five year plan production of green vehicles is going to be a strategic industry which will receive over USD 15 billion of investments in a bid to have one million cars on the road by 2015. The significant part of the investment will be in the rapid development of necessary infrastructure, more than 2,000 charging stations and 40,000 charging poles (KPMG, 2012, p. 14). However, the first results of the initiative are disappointing (Krieger, Rathke and Wang, 2012). Analyses of the above mentioned determinants give four possible scenarios of China’s auto industry development until 2020 (see Figure 2).

China’s car producers develop significant scale advantages in clean techs	Yes	The clean tech advantage Market share: 3%-6% Profit pool: USD 1 – 3 billion	A Perfect storm Market share: 7%-15% Profit pool: USD 4 – 8 billion
	NO	The Following in Hyndai’s footstep Market share: 0%-3% Profit pool: USD 0 – 1 billion	A helping hand Market share: 3%-6% Profit pool: USD 1 – 3 billion
		NO	YES

China’s car producers acquire one or more major developed markets car companies

Figure 2: Scenarios of China’s car industry development (Barbosa, Hattingh and Kloss, 2010)

The panelists in McKinsey survey saw 40% of likelihood that China’s car companies will not grasp green car production or acquire any major car companies in the current decade. This implies that China’s car companies will play a marginal role on the global market. On the other side is the scenario in which China’s car companies aggressively enter developed markets, through one or more significant acquisitions and clean technology advantage. The panelists in the survey gave it 10 to 15% chance that this scenario will be realized during the current decade (Barbosa, Hattingh and Kloss 2010). The future position of Chinese car industry will to a large depend on duration of global crises, its impact on China’s economy and restructuring activities of key players in the industry.

4. Value creation through international acquisitions – case of Geely – Volvo acquisition

During the last decade Chinese car companies have achieved a strong growth. However, the level of internationalization of these companies is rather low because they use their own capacities or create joint ventures with leading MNCs to serve primarily the growing domestic market. Chinese government created incentives to accelerate consolidation of car industry and to help at least one car manufacturer from China become one of the top ten car manufacturers. These companies will not be able to achieve greater penetration into the global market via internal development, due to severe competition in the industry and lack of intangible resources (brand, technology etc.). As it was mentioned earlier the solution to this problem could be acquisition of targets that possess the lacking resources but are facing financial problems due to global economic crisis. In the last few years there have been made some attempts at acquisitions of car companies from developed countries but they were not fully successful or failed. *Geely – Volvo* acquisition worth USD 1,8 billion has been the most serious attempt at global positioning made by a Chinese car company. *Geely* is contractually obliged not to outsource company headquarters from Sweden, not to cancel production capacities in Sweden and not to lay off acquired employees.

Enormous differences between the investor and target are the peculiarity of this acquisition. *Geely* was a local Chinese company manufacturing cheap and poor quality vehicles. Total sale in the year of acquisition accounted for 400 thousand cars, and marked 29% growth in sales compared with the year before the acquisition was made (OICA, 2012). The net profit generated in the year of acquisition accounted for around USD 200 million, that is to say the net profit increased by USD 12 million compared with the year before the acquisition was made. These impressive results are primarily due to growing demand in domestic market, but also to business rationalization measures. On the other hand, *Volvo* is a global company producing high class and mid class cars. The company has built a worldwide reputation as a manufacturer of safe and high quality vehicles. In 2009, due to the global economic crisis, *Volvo's* sale dropped by 30% and the company suffered more than USD 650 million net loss (Wang, 2011, p. 28). Since *Volvo* was part of *Ford's* group, these extremely poor results made *Ford* disinvest from *Volvo*.

Because there are considerable differences between these two companies' competitive position, corporate and national culture, organizational structure and the strategic approach they take, it will be a great challenge to implement the acquisition and achieve synergy. According to the acquisition plan the companies will continue operating separately due to considerably different product lines, consumer segments and brands. This strategy is aimed at: (1) growth in sale of *Volvo* vehicles in Chinese market (2) reduction in operational costs (3) internationalization of *Geely's* operations and growth in *Volvo's* global sale. This is the type of acquisition which is made to radically change business model used by investor.

Because *Volvo* produces luxury cars the production itself involves high fixed costs. The largest proportion of *Volvo's* fixed costs is comprised of R&D costs and wages, due to rather restrictive labor laws in Sweden. To overcome this problem it is necessary to increase production and sale, meaning to achieve economies of scale. The goal set in the acquisition plan is to reach the production of 600 thousand *Volvo* vehicles by 2015, and around 800 thousand vehicles by 2020 (Volvo, 2012a). This goal can be achieved only through increased

sales in emerging markets, primarily in Chinese market. The strategic goal is to sell more than 200 thousand *Volvo* vehicles in China by 2020. To reach this goal *Volvo* has already invested in two assembly plants and one engine plant (*Volvo*, 2012b). The positive results were soon achieved. In 2010 *Volvo* sold 31 thousand vehicles and increased sales by 50% compared with 2009 (*Volvo*, 2010). Sales growth continued in 2011 when the sales in Chinese market amounted to more than 47 thousand vehicles, and China became one of the three markets of utmost importance to *Volvo*. In the first half of 2012 *Volvo's* sales in Chinese market recorded almost negligible growth. Growth in sales will to a large depend on application of *Geely's* local knowledge, development of local dealer network and on whether *Volvo* is included in government car procurement list, dominated by *Audi* and *Mercedes*, since government car procurement accounts for about 8% of national car sales (*Wang*, 2011, p. 44). European brand enjoying good reputation that have recently acquired local dimension, which is of special importance to ethnocentric consumers, is especially useful for further expansion.

Quiet high costs considerably eroding profit margins have been one of the main problems *Volvo* faced with in the previous period. *Volvo's* assembly and production plants being built in China, whose capacities are beyond the expected sales in China's market, will significantly contribute to cost reduction. This will reduce labor force costs but also transportation costs involved in export to other countries in East and Southeast Asia. Additionally, already developed *Geely's* distribution network in China will reduce the costs of developing a new one. This strategy also involves establishment of R&D centre in China. The motive behind R&D outsourcing is cost reduction through cheaper highly qualified workers. In 2009 more than 2/3 of goods and services were sourced from Sweden, France and Belgium (countries with high costs of production) and there was no local sourcing. Employment of local suppliers that are experienced in cooperation with multinationals and meet quality standards can reduce costs. According to *Volvo's* China market entry strategy in a locally produced *Volvo* car around 60% to 80% will be sourced from China. Local sourcing will to a large depend on *Geely's* network of suppliers. The China market entry strategy is based on exploitation of location specific advantage combined with high safety standards and recognizable brand (*Rugman*, 2009, pp. 42–63). Apart from operational synergy, financial synergy is expected to be achieved through this acquisition. Because *Geely* and *Volvo* serve different consumer segments and markets there is a low correlation between their cash flows, which has positive effects on cost of capital (*Zhou and Zhang*, 2011, pp. 5–15).

Finally, the major goal behind the acquisition is internationalization of *Geely's* business operations. Safety standards were a big obstacle for *Geely's* penetration into the Triad markets (*Zhou and Zhang*, 2011, pp. 5–15). Because car industry is technology intensive, considerable investments are necessary. Internally generated technology innovations would soon prove insufficient for a more aggressively internationalization of *Geely's* operations. Through this acquisition *Geely* acquired the right to exploit technology innovations in safety, and technology innovations in highly efficient engines developed by *Ford* and *Volvo*. Due to this, the model Emgrand EC7 has received four star ratings out of maximum five, which was a precondition for *Geely's* expansion to European market (*Wautom*, 2012).

Although this represents a huge step forward, further success of the company will to a large depend on its capacity to develop and commercialize its own technology innovations. This

can be achieved only through investments in R&D, and engagement of lacking experts. Lack of global experience and undeveloped channels of distribution can be a big obstacle to international expansion. *Volvo* management can actively participate in the development of organizational structure most suitable to *Geely's* global expansion, and *Volvo's* experience and network of contacts in developed markets will contribute to establishment of distribution channels. The biggest challenge facing *Geely* is development of its own brand. In the domestic market *Geely* brand has the reputation of being cheap and of poor quality and it is quite unknown in global market. Improvements in the quality of products through acquisition of *Volvo's* technology innovations can improve the reputation *Geely* has. Brand development must be focused on "value for money" consumer segments because this segment has been neglected due to KIA and Hyundai's shift to segments with higher purchasing power. Because this brand is fairly unknown in the global market it is possible to introduce it in developed markets as innovative, safe and affordable. To achieve international success it is highly important to promote *Geely* brand without any reference to *Volvo* brand, otherwise, *Volvo's* reputation might be damaged.

Due to different national and corporate cultures, *Geely* decided to give *Volvo* great managerial autonomy. *Volvo's* top management was retained, and the company is run by the board of directors comprised of local managers and only one director from China. By not integrating *Volvo* into its business system *Geely* maybe did not fully exploit cost reduction opportunities, however, through this strategy it avoided making mistakes common to international acquisitions (Prashant, Singh and Raman, 2009, pp. 119–115). The first analysis of abnormal returns of each company's stocks during the announcement period shows that the value was not created through acquisition (Chandera and Windjojo, 2012, pp. 129–143). The fact that at the end of 2012 The China Development Bank granted *Volvo* EUR 922 million loan through *Geely's* mediation, for the purpose of paying off its matured liabilities and with the maturity of 8 years supports this statement. Before making final conclusions about the success of this acquisition it should be pointed out that investors from emerging markets are often confused about short-term goals, hence the impression that no value is created through acquisition. However, acquisitions based on clear vision and long-term orientation will certainly create value in its last instance (Kumar, 2009, pp. 2–9).

5. Conclusion

Global economic crisis created favorable conditions for more intensive acquisitions in car industry. In the previous period there were several acquisitions of small low performing car companies from developed countries by investors from China. The last and the most significant due to value of transaction and high brand awareness was *Geely – Volvo* acquisition. Chinese investors try to reinvent their business models and improve competitive position through acquisitions of companies from developed countries. Future competitiveness of Chinese car manufacturers will depend on their capacities to grasp production of electric cars or perhaps on acquisition of another big car company from developed countries.

Geely – Volvo acquisition will show whether Chinese car companies have capacities to manage international acquisitions. Investor's lack of experience in international acquisition

management, financial position of the target and differences between investor and target's national and corporate culture significantly increase the risks involved in this strategy. Revitalization of the target via economies of scale achieved through increased sales is one of the two main tasks *Geely* has taken on. This can be accomplished only through penetration into emerging markets. The first step towards this goal is establishment of two assembly plants and one engine plant in China that will serve both domestic and neighboring markets. *Geely's* local contacts and investments will allow *Volvo* penetrate local distribution channels. The second task *Geely* has taken on is to grasp technology innovations in safety in car industry considering that *Geely* vehicles failed crash tests, which are a precondition for expansion to European market. *Geely* increased its safety standards through application of the acquired technology innovations and in 2012 NCAP model received four star ratings out of maximum five in the crash test. Through advancements in quality and design of its products *Geely* should gradually build up and position its brand as "value for money".

To decrease the risks involved in integration of target *Volvo* has been given a great managerial autonomy. Potential disagreements that may arise from different corporate culture have been thus evaded and a great stimulus to the acquired management came from it. Finally, by not integrating these two brands management prevented a spillover of *Geely* brand poor reputation to *Volvo* brand. The analysis shows that there was no short-term value creation through this acquisition. However, this acquisition should not be regarded as unsuccessful because the goal behind it is not to achieve short-term financial effects but to radically change *Geely's* business model in the long run.

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INTERNATIONAL POSITION OF ESTONIA IN IMPLEMENTING RESEARCH AND DEVELOPMENT POLICY³

Abstract

The research and development policy (R&D policy) plays a central role in innovation policy since it consists of public sector measures that initialize and promote innovation. When designing policies in other areas (education, employment, fiscal, tax policy, etc.) the mutual interactions with R&D policy should be considered. The article first discusses the theoretical reasoning for public sector intervention in R&D processes. In general, the existence of market and system failures is used as a justification for government intervention. The government should intervene with adequate measures and only in an extent that is needed to overcome the failures. At the same time, the government should avoid overreacting and prevent giving state aid that distorts competition in the market. This study examines the level and structure of R&D policy resources and expenditures in EU member states and in countries that are closely linked to EU. Thus, the evaluation of the role of the R&D policy in innovation system is given. However, it has to be considered that different countries (small and large, developed and undeveloped, with open and closed economies) have different innovation policy goals and measures to achieve them. In addition, the R&D policy is designed in even wider institutional conditions. All of these qualitative aspects have to be considered when interpreting the results of quantitative comparative analysis of countries' R&D policies. The aim of the articles is to assess the international position of Estonian R&D policy in the aspects of resources and expenditures among EU member states and other closely linked countries in order to create the basis for an international comparative analysis of Estonian R&D policy. In order to achieve the aim, the following research tasks are posed and resolved:

- on the basis of research literature, the necessity, essence, measures and anticipated outcomes of R&D policy are explained;
- on the basis of empirical analysis, the assessment on the international position of Estonian R&D policy implementation among EU member states and other closely linked countries is given.

The data used in the empirical analysis (32 countries in years 2004, 2006 and 2008) is gathered from Eurostat database (including Community Innovation Surveys) and the component analysis is conducted. The results allow to design Estonian R&D policy measures that are based on acknowledged theoretical viewpoints and international experience.

Keywords

Innovation policy measures, Market failures, R&D policy, System failures

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1. Introduction

The central role in innovation policy development is executed by research and development policy (R&D policy), which represents the major complex of public sector measures to initiate and promote innovation. The objective of the current study is to assess the international position of Estonia among EU member states and countries closely associated with EU in respect of R&D policy implementation from resource supply and cost aspect. In order to achieve the objective, the following research tasks were set and fulfilled:

- through scientific literature the necessity and nature of R&D policy were identified;
- through empirical analysis an assessment was given to the international position of Estonia in implementing R&D policy among EU member states and countries closely associated with EU.

The results of the research help to design Estonian R&D policy development measures, also taking into account theoretical approaches and international experience.

2. Theoretical background of research and development policy

2.1. Elimination of market failures

Already for decades attention has been focused on an aspect that R&D outcomes have more the nature of public than private good (Nelson, 1959; Arrow, 1962). To large extent, their consumption has no rivalry – the invention or innovation can be used in parallel and the utility can be acquired by endless amount of consumers without changing the nature of the innovation or invention (see Romer, 1990; Grossman and Helpman, 1991; Aghion and Howitt, 1992). Still, there is market competition in R&D activity – the utility of innovation or invention for the first marketer remarkably decreases after it is being applied by competitors. From the viewpoint of the first user of invention or innovation, it raises an important problem of excluding unentitled persons (competitors) from the consumption of R&D work (the protection of intellectual property). As the protection of intellectual property is often so difficult and expensive, the economic rationality of its application should be considered. Therefore, the necessity of R&D policy is derived from the fact that due to the absence of competitive rivalry in consumption, it is not a pure private good and firms cannot afford excluding unentitled persons from the consumption of R&D work. The application of exclusion principles demands intervention of the public sector, as the owners of inventions (innovations) cannot cope with it for themselves. Still, the public sector intervention for excluding market competition because of the practical absence of rivalry in the consumption of the R&D results in most cases cannot be justified.

It should be checked whether public sector R&D subsidies really stimulate private firms to increase R&D costs (supplement them) or replace (substitute) them (Leyden and Link, 1991; Lach, 2002). Public sector R&D costs increase total social R&D costs when public sector support influences the private sector to provide R&D funds to projects that without the support would not be profitable (Klette et al., 2000; Wallsten, 2000; Jaffe, 2002; Tokila et al., 2008). A threat that public sector support will substitute private sector R&D costs emerges

inevitably in cases where the private sector has necessary resources but they are more expensive than those offered by the public sector (Jaffe, 2002; Blanes and Busom, 2004).

2.2. Eliminating system failures

System failures restraining R&D work and the usage of its results can be classified as follows (Arnold, 2004): *capability failures* – the incapability of research institutions to act derived from bad management, lack of competence, weak study capabilities and other deficiencies; *failures in institutions* – the stiffness of the activities of organizations (universities, research institutes, patent offices, etc.) and thus the incapability to adjust to environmental changes; *network failures* – problems in the relationships of innovation system parties, which are characterized by the shortage of relations or their insufficient quality, the incapability to apply new knowledge and tangling in morally aged technology; *framework failures* – deficiencies in legal institutions, intellectual property protection, health and safety requirements and other background conditions, including social values; *policy failures* (Tsipouri et al., 2008) – deficiencies in the government related to R&D policy development, coordination with other policies and the assessment of policy outcomes, etc.

In order to overcome system failures reducing R&D work efficiency, the public sector must develop an evaluation system for research institutions, systematically direct research institutions to fulfil tasks important for economics, create networks to spread new knowledge and implement counselling programs, but also improve regulatory mechanisms that are important to develop R&D work. Still, it should be taken into account that public sector intervention should be in accordance with the nature and impact of the system failure, the efficiency of resources used should be maximum and regulations should not reduce private sector's initiative and responsibilities necessary for the research work. When considering the rationality of public sector intervention, different public sector failures (the instability of political decision process, the increase of bureaucracy, decision makers' irresponsibility for the results, the possibility of corruption, etc.) must be considered.

The diversity of R&D work means that when designing R&D policy, all institutions and organisations should be directed to cooperate to achieve common objective. This means, creating an institutional environment favouring interactions between organizations. Institutions are defined as the collection of habits, norms, routines, practices, rules or laws that regulates relationships and interactions between individuals, groups and organizations (Edquist and Johnson, 2000). The importance of institutions in guaranteeing the development of innovation is also emphasized by Klun and Slabe-Erker (2009).

3. International comparative analysis of research and development policy implementation

3.1. Data and variables used in analysis

In total 32 countries are used in the analysis (27 EU member states, Croatia, Turkey, Iceland, Norway and Switzerland). The statistical data used is from Eurostat on-line database and

Community Innovation Survey (CIS) studies. In the current study, data from three years is applied in order to follow the dynamics of different policy aspects. All variables in analysis have been taken from years 2004, 2006 and 2008. Given years have been chosen because for those years all the variables have values available. Several variables come from the CIS study, which is conducted every two years and data from year 2008 is the newest available.

Many theoretical approaches and empirical research (European Commission, 2003; Falk, 2004; OECD, 2005, 2007; Koch et al., 2007; Manjón, 2010) have brought out several variables that describe public sector R&D policy and which can be used to assess the level and structure of R&D policy in different countries. In the current study, the following variables will be used to comparatively assess public sector R&D activities in EU member states and countries closely associated with EU (see tables 1 and 2). Analysing different variables separately would give fragmented results. In the current analysis, data describing public sector R&D activities are considered as a whole complex taking into account the interconnections of variables.

One of the goals of the R&D policy is to develop R&D activities carried out by the public sector. This aspect is described by first set of variables (see table 1). First four variables describe R&D activities carried out in the public sector. For those variables it must be accounted that not all R&D expenditure in government and higher education sector are financed by the public sector – some of the funding is provided by the business and non-profit sectors, but also from the external sources (mainly EU institutions). Therefore, it is important for each country to bring out those variables that describe R&D expenditure funded by the government sector of that country (variables 5-6). Variable 7 describes government budget – more specifically its share in R&D financing. It is important to note that government budget includes some specific funds acquired from EU institutions, namely EU structural funds that support R&D activities. Last two variables in the table 1 describe the share of public sector R&D personnel in total employment, which describes the supply of work force in public sector R&D activities.

No	Abbreviation	Variable description
1	GOVgdp	Government sector R&D expenditure (% of GDP)
2	GOVshr	Share of government sector R&D expenditure (% of total R&D expenditure)
3	HESgdp	Higher education sector R&D expenditure (% of GDP)
4	HESshr	Share of higher education sector R&D expenditure (% of total R&D expenditure)
5	GOVtoGOV	Government sector R&D financing from the government sector budget (% of GDP)
6	GOVtoHES	Higher education sector R&D financing from the government sector budget (% of GDP)
7	GBAORD	Share of government budget appropriations or outlays on R&D in government sector total costs (%)
8	empGOV	Share of government sector R&D personnel in total employment (% according to data converted to full time equivalents)
9	empHES	Share of higher education sector R&D personnel from total employment (% according to data converted to full time equivalents)

Table 1: Variables describing public sector R&D activities (compiled by the authors)

The second important area of R&D policy is supporting business sector R&D activities. Variables describing public sector support to private sector R&D activities are given in table 2. In different studies, six business sector R&D financing indicators have been used. First two measure the level of government sector financial support to business sector R&D activities. The following four variables are based on the CIS study. Variables 3-6 describe the share of innovative enterprises that received public financial support for innovation activities. The support may be obtained from different levels of government (local or regional authorities, central governments and EU institutions).

No	Abbreviation	Variable description
1	GOVto BESgdp	Business sector R&D financing from the government sector budget (% of GDP)
2	GOVto BESshr	Share of government sector financing in business sector total R&D expenditure (%)
3	funPUB	Share of innovative enterprises that received any public funding (% of total innovative enterprises)
4	funLOC	Share of innovative enterprises that received funding from local or regional authorities (% of total innovative enterprises)
5	funGMT	Share of innovative enterprises that received funding from central government (% of total innovative enterprises)
6	funEU	Share of innovative enterprises that received funding from EU (% of total innovative enterprises)

Table 2: Variables describing public sector support to business sector R&D activities (compiled by the authors)

3.2. The results of empirical analysis

Table 3 shows the statistical parameters of variables describing public sector R&D activities and the level and structure of the public support for private sector R&D activities. The table indicates that the values of variables vary remarkably through EU member states and countries associated with EU, both in absolute (the difference between minimum and maximum levels) and relative terms (the relationship of standard deviation to mean).

Variable	Mean	Standard deviation	Minimum value	Maximum value	Value in Estonia	Estonian difference from mean standard deviations (in)
GOVgdp	0.20	0.11	0.01	0.68	0.14	-0.54
GOVshr	17.74	12.51	0.74	67.01	12.72	-0.40
HESgdp	0.37	0.20	0.02	0.82	0.47	0.48
HESshr	27.83	11.92	1.23	67.87	43.01	1.30
GOVtoGOV	0.16	0.10	0.01	0.57	0.11	-0.58
GOVtoHES	0.29	0.17	0.02	0.65	0.36	0.41
GBAORD	1.27	0.48	0.35	2.36	1.41	0.31
empGOV	0.16	0.10	0.02	0.52	0.12	-0.39

empHES	0.33	0.14	0.08	0.75	0.39	0.43
GOVtoBESgdp	0.05	0.04	0.00	0.19	0.03	-0.55
GOVtoBESshr	7.74	7.54	0.28	47.00	6.29	-0.20
funPUB	21.17	9.96	4.90	45.79	10.76	-1.06
funLOC	5.80	6.20	0.00	25.73	1.03	-0.77
funGOV	14.52	10.23	1.41	42.78	7.96	-0.64
funEU	6.43	4.22	0.99	19.69	3.53	-0.72

Table 3: Statistical characteristics of variables describing public sector R&D activities and the level and structure of the public support for private sector R&D activities⁴

Estonian position in public sector R&D activities and in the level and structure of the public support for private sector R&D activities can be seen on chart 1. On the chart, the difference in minimum and maximum values (in standard deviations) and Estonian mean value for each indicator is given. The chart shows that the position of Estonia is the best for the variable *HESshr* (share of higher education sector R&D expenditure in total R&D expenditure) and the worst for the variable *funPUB* (share of innovative enterprises that received any public funding).

Chart 1 indicates that according to variables describing higher education sector R&D financing, the share of higher education sector R&D personnel and government budget appropriations or outlays on R&D Estonia holds a higher position than the average of EU countries. For the rest of the variables describing public sector R&D activities and the level and structure of the public support for private sector R&D activities, Estonia has lower values than the EU average. Therefore, in Estonia the financing of government sector R&D activities, the share of government sector R&D personnel and the public funding for business sector R&D are lower than the average of EU. In Estonia, the main contribution of innovation promotion is expected from the higher education sector and public support for private sector R&D is seen to be rational on a lower level than the EU average.

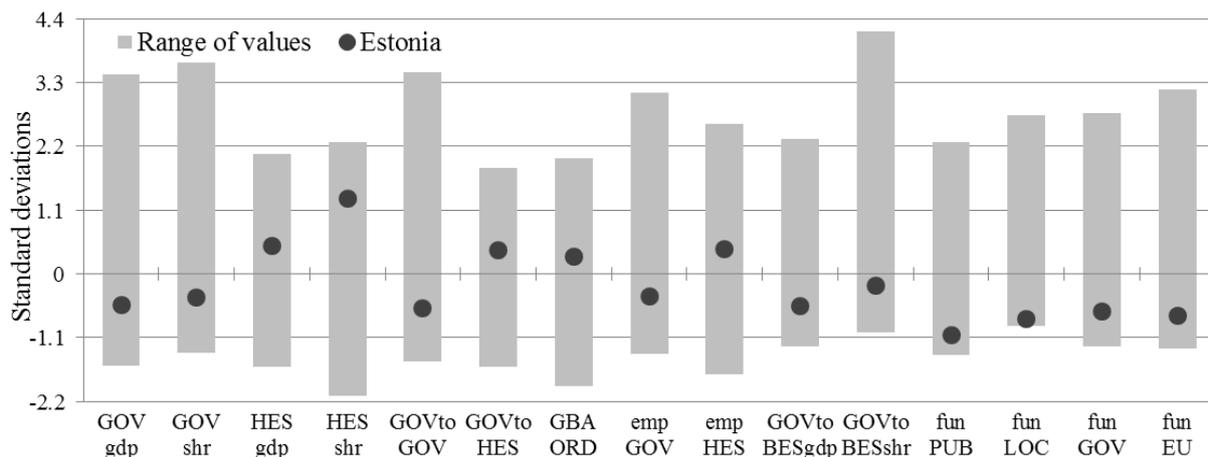


Chart 1: Estonian position among variables describing public sector R&D activities and the level and structure of the public support for private sector R&D activities

⁴ Values have been calculated as the mean of three years (2004, 2006, 2008).

Subsequently, component analysis is conducted with the variables describing public sector R&D activities and the level and structure of the public support for private sector R&D activities. The results of component analysis (table 4) show the structure of public sector activities promoting and supporting innovation. Component analysis is based on the correlations in the set of variables.

	K1 Level of higher education sector R&D financing	K2 Level of government sector R&D financing	K3 Share of central government in financing R&D activities of firms	K4 Level of business sector R&D financing by public sector	K5 Share of EU in financing R&D activities of firms
HESgdp	0.96	-0.01	0.07	0.05	-0.03
GOVtoHES	0.94	0.02	0.11	0.08	-0.06
empHES	0.85	0.06	-0.02	-0.03	0.26
GBAORD	0.78	0.23	0.11	0.18	-0.34
GOVshr	-0.68	0.45	-0.14	-0.10	0.25
GOVgdp	0.10	0.97	-0.02	0.09	-0.01
GOVtoGOV	0.09	0.96	-0.05	0.10	-0.08
empGOV	-0.06	0.94	0.03	-0.13	-0.08
funPUB	0.11	-0.10	0.96	0.15	0.10
funGMT	0.09	0.03	0.94	-0.08	-0.10
GOVtoBESgdp	0.34	0.22	0.00	0.83	-0.08
funLOC	0.25	-0.21	0.27	0.64	0.02
GOVtoBESshr	-0.45	-0.01	-0.08	0.62	0.16
HESshr	0.11	-0.47	0.16	-0.48	0.28
funEU	-0.10	-0.12	0.00	0.01	0.93
Component eigenvalue	4.40	3.49	1.79	1.63	1.12
Cumulative variance explained	29.32	52.61	64.56	75.43	82.87
Significance of Bartlett test	0.00				
KMO	0.63				

Rotation method: Varimax

Table 4: Component analysis in the set of variables describing public sector R&D policy

The component analysis covering the indicators describing public sector R&D policy brought out five independent synthetic complex indicators (components) describing the internal structure of the variables. As the result of component analysis the number of variables describing public sector R&D policy decreased by two thirds (i.e. from 15 to 5), but less than half of the information (variation) included in initial variables was lost (82.9% of the variance of initial variables is explained).

Explaining the nature of synthetic components and giving adequate names for the new indicators is a complicated task. In the current study, the method applied by Karu and Reiljan (1983) is used to explain the economic nature of components as synthetic new variables.

With the first component K1 three variables, that describe higher education sector R&D funding and the share of higher education sector R&D personnel in total employment, are closely connected. In addition, variables that describe government budget appropriations or outlays on R&D and the share of government sector R&D expenditure in total R&D expenditure are strongly connected with the given component. In case of the last variable a reciprocal association exists that explains the crowding out effect of higher education sector R&D funding by government sector R&D funding. The nature of the first component is described with the name "Level of higher education sector R&D financing", whereas the level of funding also affects the possibility of employing R&D personnel.

With the second component K2 three variables, that describe government sector R&D financing and the share of government R&D personnel in total employment, are strongly associated. With the given component, variables *GOVshr* (the share of government sector R&D expenditure in total R&D expenditure) and *HESshr* (the share of higher education sector R&D expenditure in total R&D expenditure) are weakly associated. The association with the variable *HESshr* is negative, which indicates the substitution of government sector R&D financing by higher education sector R&D financing. This component is characterized by the name "Level of government sector R&D financing".

The third component K3 includes two initial variables that explain the share of innovative enterprises that received funding from the public sector (more specifically from the central government). The nature of the third component is described by name "Share of central government in financing R&D activities of firms".

With the fourth component K4, three variables are strongly associated that describe the level and share of government sector financing in business sector R&D and the share of innovative enterprises that received funding from local or regional authorities. The nature of given component is in the best way explained by the name "Level of business sector R&D financing by public sector".

The fifth component K5 is composed of only one indicator – the share of innovative enterprises that received funding from EU among all innovative firms. That is why this component is explained by the name "Share of EU in financing R&D activities of firms".

Component scores describe each country in the analysis. As each country is represented in the sample with data from three years, there are three component scores for every country. In order to compare countries, they are characterized with the mean of three component scores. Component scores indicate that the structure of public sector R&D policy remarkably varies through countries – countries emphasize different R&D policy areas. To assess the international position of Estonia, a chart illustrating the results is used (see chart 2).

On chart 2 Estonian average positions among the analysed countries are shown using five complex indicators (components) that explain public sector R&D policy in a way that the

difference from the mean value and the distance from the extreme values can be seen. When in general Estonia is below the average level of R&D policy implementation, Estonian activities can still be considered balanced – in the case of three components the difference from the average level is smaller than the distance from the extreme values.

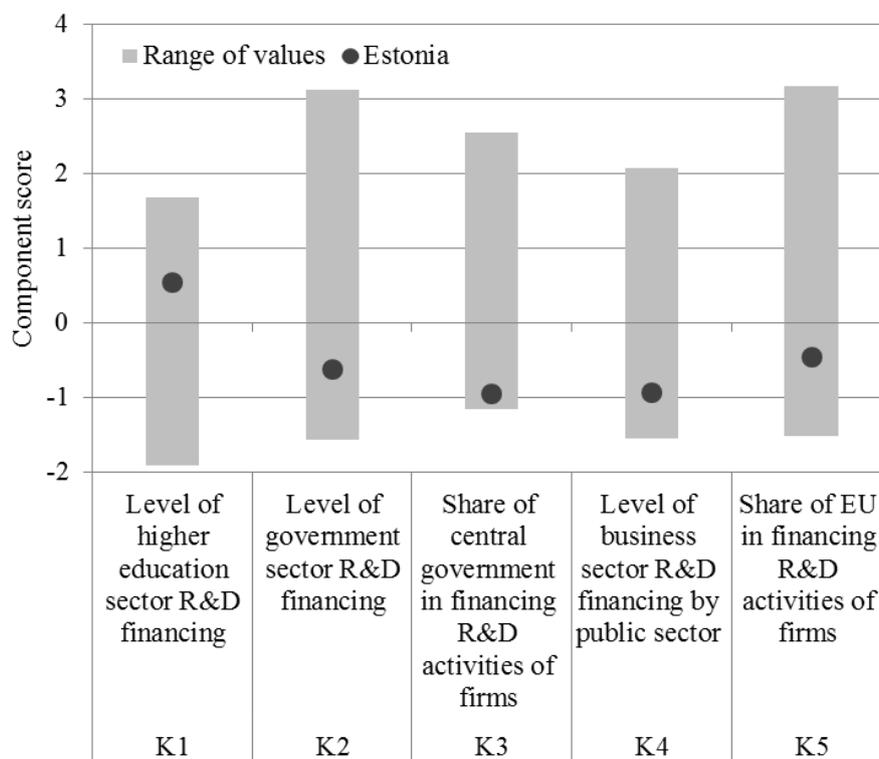


Chart 2: Estonian position among analysed countries using the five components describing public sector R&D policy

According to the component K1 (the level of higher education sector R&D financing), Estonian average component score is higher (by 0.54 standard deviations) than the average of analysed countries and Estonia is situated in the first third among all countries (on the 9th position). Thus, the public sector finances higher education sector R&D on higher level than the European average. This indicates that in Estonia many expectations are set on universities as promoters of R&D. In the case of small open country, it should be considered reasonable as new knowledge should mainly be transferred to specialists through the learning process and this is mostly done by the academics involved in R&D activities. In the case of the first component, the most similar country to Estonia is the Netherlands. The highest component values are in Finland (1.7) and Sweden (1.6), the lowest (negative) values in Romania (-1.9) and Bulgaria (-1.8).

In the case of component K2 (the level of government sector R&D financing), Estonia is by 0.62 standard errors lower than the average of analysed countries and situates on the 24th position. This means that the government sector with its research and scientific personnel does not create remarkable support potential for the business sector and neither is a supportive cooperation partner. In order to find out whether setting such objective would be reasonable at all, it is necessary to study the impact of government sector R&D activities on the business sector. The comparison with other countries offers a few standpoints in this

respect. In the case of K2, Estonia is similar to Greece and Denmark. The highest values are in small countries Iceland and Bulgaria (3.1 and 1.6) and the lowest in Malta (-1.6) and Turkey (-1.3).

The value of the component K3 (the share of central government in financing R&D activities of firms) is -0.96 in Estonia and it situates on the 28th position in the list of countries – only in four countries the component scores are smaller. The financing of business sector projects by the central government demands enough competence to create long-term innovation policy strategies on government level, but also capability to set and solve very specific development tasks to eliminate market and system failures. Profound research is needed to find out the presence of such competence and capabilities in Estonia. Thus, the modesty of Estonia in this R&D field can be considered natural. According to the third component, the similar countries to Estonia are Iceland and Slovakia. The central government supports R&D processes the most in Norway and Cyprus (component scores 2.6 and 2.1), the least in Romania (-1.2), Latvia (-1.0) and Bulgaria (-1.0).

According to the component K4 (the level of business sector R&D financing by public sector), Estonia is situated on remarkably lower level than the average (component score -0.94) and is analogically to the previous component on the 28th position. The low level in that policy field is derived from the fact that Estonia has no regional government level and the local government generally does not have resources and competence to support R&D activities. According to the fourth component, Portugal and Turkey are the most similar countries to Estonia. The highest component scores are in Austria (2.1) and Romania (1.9). The lowest level is in Lithuania (-1.5) and Croatia (-1.1).

Estonian component score for the component K5 (the share of EU in financing R&D activities of firms) is -0.47 and it is situated on the 23rd position among analysed countries. In the given field some deficiencies of Estonian R&D policy must be admitted – namely, the public sector is not able to help the business sector in applying and implementing EU support. According to this component, Estonia is most similar to Bulgaria and Ireland. In this policy field, the best results are in Greece (3.2) and Poland (2.2). The lowest levels are in Luxembourg (-1.5), Turkey (-1.3) and Croatia (-1.1).

When viewing all five innovation policy components together it is revealed that among all analysed countries the best results are in Finland – all five component scores have positive values. The worst results are in Malta – all five components have negative component scores. Estonia is with one over average and four below average values situated on the negative side, but in order to give a specific assessment, more elaborate analysis is needed.

As component analysis includes data from three years, it is also possible to view the dynamics of component scores. On chart 3 the value of Estonian component scores for each year have been given.

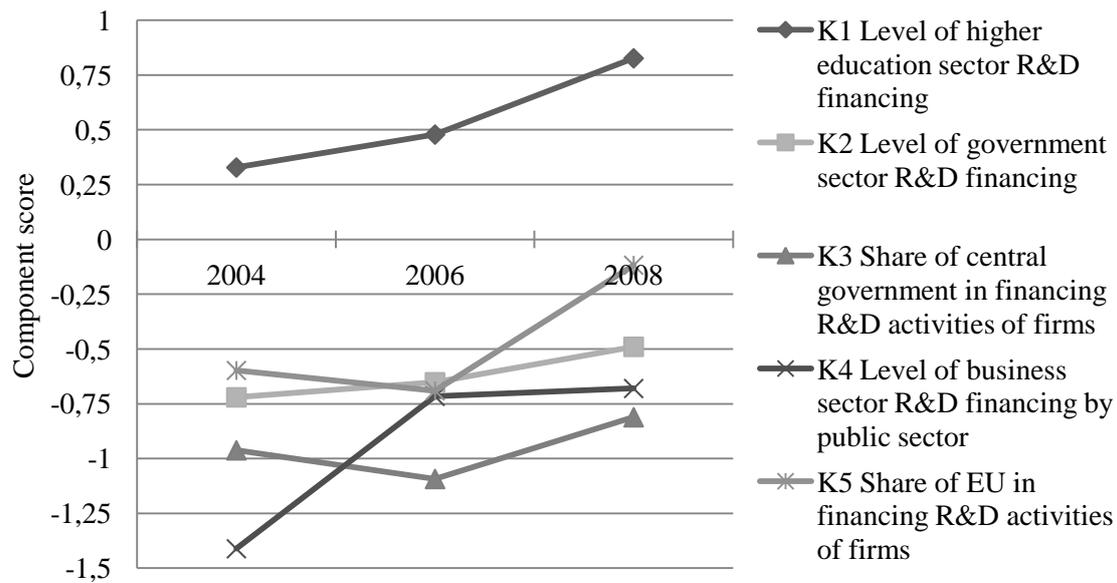


Chart 3: Component scores describing Estonian public sector R&D policy in 2004, 2006 and 2008

Chart 3 shows that for all five components Estonian component scores have grown in time, which means that the position in comparison to the average level of analysed countries has risen. Although in 2006 there was a small decrease in the position (the decrease of component score) of two components (K3, K5), Estonia has considerably moved towards the average of EU countries in the respect of R&D policy implementation. The largest increase has occurred in the value of the fourth component (the level of business sector R&D financing by public sector) and the modest is the growth of the third component (the share of central government in financing R&D activities of firms).

4. Summary

Designing national R&D policy is a difficult task from the aspects of making a choice among the variety of instruments, as well as the several-folded nature of the impact that different instruments create. There are large discrepancies in both R&D policy theoretical and empirical approaches. The current study systematised available theoretical approaches, analysed problems brought out in empirical studies and gave an assessment to the international position of Estonian R&D policy implementation based on the empirical analysis of the dataset of EU member states and countries closely associated with EU.

The reason for public sector R&D policy implementation is to eliminate the market and system failures restraining R&D progress. Market failures are mostly derived from the aspect that from the viewpoint of rivalry, the results of R&D have principally public good nature and the exclusion from the usage of those results is often unpractical. The positive externality of R&D must be taken into account, because the private demand is inevitably lower than the social rational level and with R&D policy measures the demand must be brought to the social utility level. Information constraints do not enable firms to risk with long-term R&D investments and public sector must fulfil the investment gap threatening state development.

Due to the system failure, the cooperation between different parties of national innovation system does not function smoothly or some institutions and organisations do not fulfil their tasks efficiently. The creation of formal institutions and cooperation organizations promoting R&D development is the immediate responsibility of the public sector. Innovation policy determines the tasks of the R&D policy in promoting innovation in a country and reciprocal connections with the supportive components of the innovation policy (education policy, cooperation development policy and business environment policy).

Still, the intervention by the public sector needs careful analytical justification, as incompetent intervention can distort market processes and shape a R&D policy with irrational scope or structure.

Empirical analysis showed that according to most indicators, that describe public sector R&D activities and the level and structure of the public support for private sector R&D activities, Estonia is below the average level among the countries analysed. Component analysis brought out five dimensions of public sector R&D policy:

- K1 – the level of higher education sector R&D financing;
- K2 – the level of government sector R&D financing;
- K3 – the share of central government in financing R&D activities of firms;
- K4 – the level of business sector R&D financing by public sector;
- K5 – the share of EU in financing R&D activities of firms.

Only in the case of K1 (the level of higher education sector R&D financing) Estonian level is higher than the average of analysed countries, whereas according to other R&D policy components Estonia is below the average level. This is a somewhat expected result, as in the case of a small open country external sources are considered important for obtaining innovative knowledge.

Although the position of Estonia according to most components describing public sector R&D policy is relatively modest, an important progress has occurred during the four year period (2004–2008) and Estonia has become remarkably closer to the average level of EU member states and countries closely associated with EU. After the CIS data is published for year 2010, the impact of world economic and financial crisis on Estonian public sector R&D policy can be analysed.

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BOARD DIVERSITY, NETWORK AND FIRM VALUE

Abstract

Using a large sample analysis of Thai listed firms, we address an important question. Do board diversity and network add value to firms? This article extends the debate on the benefits and costs of board diversity and network and their effect on the broader picture of corporate governance. Moreover, this article sheds light on the necessity of applying the resource dependence theory in research about boards of directors, in addition to the agency theory. We find that diversity in age and study majors are positively related to Tobin's Q ratio, while diversity in educational levels leads to lower firm value. Our results suggest that boards with diverse age groups and study areas might generate useful advice and complement each other; however, those with diverse educational levels might create costs due to possible conflicts and a lack of coordination and communication. In addition, the results show that alumni networks have a positive effect on Tobin's Q ratio. The findings further suggest that an alumni network is significant to firms because it could help firms obtain external resources. Overall, our research provides significant findings for policy makers to widen viewpoints about corporate governance practices and human resource development in emerging countries.

Keywords

Board of Directors, Diversity, Firm Value, Network, Thailand

1. Introduction

In a world of increasing globalization, where countries cooperate in order to create even larger economic communities, questions arise as to what are the most important characteristics in determining the success of a firm in a particular market? Given that many countries have different cultural backgrounds and legal frameworks, it is not necessarily going to be the case that the characteristics that guarantee success in one market lead to success in another. However, a common characteristic of many firms is the presence of a board of directors.

A board of directors is one effective governance mechanism, the efficacy of which is widely recognized in both U.S. and non-U.S. models (Globerman, Peng and Shapiro, 2011; Hermalin and Weisbach, 2003; Kaplan and Minton, 1994; Yermack, 2006). In theory, a board represents all shareholders. It is charged with hiring, monitoring, evaluating, replacing, and advising management to ensure that all managerial decisions maximize shareholder returns. Among these functions, the monitoring and advising functions appear to be the most important (Adams and Ferreira, 2007; Boone, Field, Karpoff and Raheja, 2007; Raheja, 2005).

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Given the influence that a board of directors has on a firm, and thereby its chances of success, an obvious question is, what characteristics do successful boards share in a particular market?

Because the individuals who constitute boards have a great deal of influence over the decision-making process, shareholders and potential investors need to be aware of, and understand, the various characteristics of the individuals who make up the board. When examining this issue, most existing literature has focused on board composition, in particular the monitoring role of boards in governing management teams based on a principle-agent framework. While board composition is considered an important corporate governance mechanism (Globerman et al., 2011; Hermalin and Weisbach, 2003; Kaplan and Minton, 1994; Yermack, 2006), previous work has suggested that other board characteristics such as qualifications and competency of directors, diverse background of directors and the social network of board members are also important during the decision-making process (Espenlaub, Khurshed and Sitthipongpanich, 2012; Johnson and Powell, 1994; Peng, Buck and Filatotchev, 2003).

Moreover, Jiang and Peng (2011) suggest that institutions matter in corporate governance. Network is one of the major institutional characteristics in economies with inefficient markets. At the micro-level, network—both political and alumni, for example—could increase firm value; on the other hand, policy makers should be aware of unfair treatments from close connections. At the macro-level, improving resource allocation could help institutional and economic development. We ask whether firms could overcome market inefficiency through informal and private networks of directors.

When assessing the significance of boards of directors on firm performance and value, the majority of existing empirical research focuses on board structure, which is based upon a principle-agent framework. Specifically, existing studies examine how the size of the board, degree of separation between the chairman and the CEO, and increasing representation by independent directors make boards more effective in the performance of their monitoring role. While the agency theory views a board of directors as monitors over management teams, the resource dependence theory suggests that directors play an important part in providing various advice to managers and extracting external resources for firms.

This study examines how the characteristics of a board influence decision making within a firm. In particular, this paper examines how diversity in the characteristics of a board such as gender, age, educational background, professional expertise and international perspectives affect firm value. On the one hand, it may result in new ideas and skills being brought into the firm, which improve monitoring and advisory efficiency (Anderson, Reeb, Upadhyay and Wanli, 2011). On the other hand, a board with highly diverse individuals may experience some coordination and communication problems (Milliken and Martins, 1996). Additionally, not only does a diverse board bring ideas and skills, but also they bring their social networks of both personal and professional connections. Agrawal and Knoeber (2001), Khwaja and Mian (2005) and Siegel (2007) document, for example, that political networks could help firms obtain external resources such as government concessions; moreover, networks of friends and alumni could provide useful information including opportunities for investment. Nevertheless, Fan, Wong and Zhang (2007) argue that politically connected boards adversely

affect firm value and might lead to expropriation problems.

Additionally, the majority of previous studies have analyzed boards in developed markets such as the U.S., UK, Japan, Germany, and Australia. Little evidence has been documented on how board characteristics influence the decision making of firms in emerging markets, such as those in Asia. This study aims to redress this balance in part by using the experience of Thailand as an example. The 1997 Thai economic meltdown had been perceived as the origin of the whole Asian region's financial failure, indicating that more understandings about Thai firms are needed (Peng, Au and Wang, 2001). Moreover, institutional settings in which corporate governance is embedded are different between developed and emerging markets (Claessens, Djankov and Lang, 2000; Globerman et al., 2011; La Porta, Lopez de Silanes and Shleifer, 1999). Furthermore, a single country study provides a unique analysis because the influence of board of directors can vary under different legal systems, institutional settings, and governance frameworks (Filatotchev, Jackson and Nakajima, 2012).

This study aims to make a number of contributions. First, in addition to examining board composition, an area that has already been extensively studied, we examine how diversity in gender, age, educational background, professional expertise, and international perspectives affect firm value. Second, previous research by Yammeesri and Herath (2010) determines that board composition is not related to firm value in Thai firms. Hence, in this paper we attempt to determine what are the characteristics of Thai boards that do influence firm value. Third, we extend the research done by Choi, Park and Yoo (2007), who focus on the role of outside independent directors as a mechanism of corporate governance in response to the regulatory reform after the Asian financial crisis. The authors find the strong effect of board independence on firm value. We extend their paper by looking at the characteristics of Thai boards in response to public attention of good governance practices, e.g., director qualifications, board diversity and network, and board composition in the wake of the Asian financial crisis. Finally, networks are found to be one of the key institutional characteristics in the Asia-Pacific region (Bunkanwanicha and Wiwattanakantang, 2009; Espenlaub et al., 2012; Peng et al., 2001; Siegel, 2007). In Thailand, Peng et al. (2001) find that military directors are significant to multinational firms. This article differs from Peng et al. (2001) in that proxies of networks combine both political connections, namely ex-military and ex-bureaucrats, and university alumni networks. The remainder of this article begins with backgrounds of corporate governance in Thailand, followed by hypotheses, methods, findings, and discussion.

2. Hypotheses

This study breaks down our question of diversity and network into eight discreet hypotheses. Six hypotheses concerning diversity are addressed: 1) gender, 2) age, 3) educational levels, 4) study majors, 5) expertise, and 6) international perspectives. The two remaining hypotheses concerning network are addressed: 7) political connections and 8) alumni networks.

2.1. Gender

From the view that female directors bring different ideas and attributes to board discussions and provide additional board monitoring (Letendre, 2004), gender diversity on boards benefits the firms. We hypothesize that a higher proportion of female directors increases firm value.

Therefore:

Hypothesis 1 Diversity in gender has a positive impact on firm value.

2.2. Age

Regarding how age diversity in boardrooms affects performance, Hagendorff and Keasey (2012) document that director age diversity increases merger returns in the banking industry. McIntyre and Mitchell (2004) find a positive effect of the variation in director age on firm performance. They also find that there exists an optimal level of age diversity among board members. Thus, they argue that boards with too little diversity may lack a variety in knowledge, skills and experience, while boards with too much diversity may have conflicts and communication problems.

Therefore:

Hypothesis 2 Diversity in age has a positive impact on firm value.

2.3. Educational levels

As noted by prior research, the educational level indicates an individual's knowledge base and intellectual ability (Bhagat and Black, 1999). A director could use his/her educational knowledge to come up with distinctive perspectives and innovative ideas in advising the management team. It is expected that a board of directors with diverse educational levels could provide applicable and constructive advice to boards, thus resulting in higher firm value.

Therefore:

Hypothesis 3 Diversity in educational levels has a positive impact on firm value.

2.4. Study majors

Various academic majors of directors likely provide managers with broader advice, consistent with the findings of Kim and Lim (2010). They document that diversity in study areas is positively related to Tobin's Q ratio.

Therefore:

Hypothesis 4 Diversity in study majors has a positive impact on firm value.

2.5. Expertise

A board of directors could effectively perform as a result of the presence of diverse functional knowledge and skills of directors. A diversity of talented members could allow firms to obtain different external resources. Using their area of expertise, directors can contribute ideas and share their experience in board meetings (Anderson et al., 2011). It is expected that the expertise of directors matters to firms and will increase the effectiveness of boards and possibilities to obtain external resources, thus leading to higher firm value.

Therefore:

Hypothesis 5 Diversity in expertise has a positive impact on firm value.

2.6. International perspectives

We hypothesize that directors graduated from abroad are expected to have wider viewpoints and to conform to the international environment, which might bring higher competitive advantages over their local rivals (Leblanc and Gillies, 2005). Therefore, it is expected that directors with international perspectives could bring higher benefits, hence increasing firm value.

Therefore:

Hypothesis 6 Diversity in international perspectives has a positive impact on firm value.

2.7. Political connections

Political connections are found to be related to firm performance. The relationship between outside directors with government experience and firm value is positively significant (Kim and Lim, 2010). The experience of retired bureaucrats is considerably useful in some industries, and firms that deal with the government generally appoint ex-bureaucrats as their directors (Agrawal and Knoeber, 2001; Miwa and Ramseyer, 2005). We expect that political connections of directors are beneficial to firms.

Therefore:

Hypothesis 7 Political connections of directors have a positive impact on firm value.

2.8. Alumni networks

Directors graduated from elite universities are expected to be socially united because of strong ties among alumni and a long history of their institutions. Directors who are tied to such social networks are believed to obtain useful information because of lower asymmetric information among network members (Palmer and Barber, 2001; Siegel, 2007). The relations among network members could facilitate connected directors to extend relations to other stakeholders of firms. Such linkages can obviously help firms in accessing potential markets and finding financial or strategic partners. As a result, connected directors would be able to

bring higher financial benefits to firms.

Therefore:

Hypothesis 8 Alumni networks of directors have a positive impact on firm value.

3. Sample, data and methodology

Sample firms are non-financial firms listed on the SET, covering the period of 2001 to 2005. This sample period reflects the consequences of one of SET's best practice responses to the financial crisis in 1997, which was to promote professionalism through the training of directors of Thai listed firms. In addition, the period highlights the foresight of listed firms and policy makers in improving corporate governance concerning boards of directors.

The information used to define board characteristics is publicly available from the SET. We focus only on director data, which are provided in Form 56-1, which the Stock Exchange of Thailand requires all listed firms to submit. It is used to disclose relevant information of the company to the public. In addition, financial data are collected from the SETSMART database, which compiles company information of Thai firms listed in the SET. In this study, all financial data are winsorized at 1% and 99%.

We exclude firms in the banking and financial sector because of their non-traditional financial statements. Firms with missing 56-1 forms and financial statements are also removed from the sample. In addition, observations are excluded from the sample if the firm data are in the year of rehabilitation.

We obtained director biographies, including gender, age, educational background, and previous work experience over the previous five years (or more). The individual director data are quantified and aggregated for the whole board to describe the characteristics of a board of directors. Then we define board diversity and network.

Regarding variables in director characteristics, gender diversity is measured by the ratio of the number of female directors to the total number of directors. Diversity measures of age, educational levels, study majors, and expertise are defined by a modification of the Herfindahl Index (HHI). HHI is a concentration measure, while our modified index is a measure of diversity, which is also applied by Hagendorff and Keasey (2012) and Kim and Lim (2010).

Age of directors is divided into five age cohorts: less than 30 years old, 31-40 years old, 41-50 years old, 51-60 years old, and greater than 60 years old. Diversity in age is defined as follows:

$$\text{Diversity in Age}_{i,t} = 1 - \left[\sum_{g=1}^n \left(\frac{\text{Age}_g}{\text{Total number of directors}} \right)^2 \right]_{i,t}$$

where Age_g = the number of directors in each age cohort (g).

The educational levels are categorized into the four highest educational levels, i.e., below bachelor's, bachelor's, master's, and doctoral degrees. The variable of the educational levels is defined as a percentage of directors with each of the highest degree level within a board of directors. Diversity in educational levels is defined as follows:

$$\text{Diversity in educational levels}_{i,t} = 1 - \left[\sum_{g=1}^n \left(\frac{\text{Edu}_g}{\text{Total number of directors}} \right)^2 \right]_{i,t}$$

where Edu_g = the number of directors in each category of educational levels.

We also classify different knowledge bases into six study areas: 1) accounting/finance/economics, 2) business-related knowledge, 3) law, 4) engineering/science, 5) medicine, and 6) others. Diversity in study majors is defined as follows:

$$\text{Diversity in study majors}_{i,t} = 1 - \left[\sum_{g=1}^n \left(\frac{\text{Major}_g}{\text{Total number of studymajors of all directors}} \right)^2 \right]_{i,t}$$

where Major_g = the number of majors held by all directors in each study area.

Work experience of directors is divided into seven areas of expertise: 1) accounting/finance/economics, 2) business, 3) law, 4) engineering/science, 5) medicine, 6) academic professor, and 7) others. Diversity in expertise is defined as follows:

$$\text{Diversity in expertise}_{i,t} = 1 - \left[\sum_{g=1}^n \left(\frac{\text{Expertise}_g}{\text{Total number of work experience of all directors}} \right)^2 \right]_{i,t}$$

where Expertise_g = the number of work experience held by all directors in each area of expertise.

The variable of diversity in international perspectives of directors is defined as the ratio of the number of directors graduated from abroad to the number of directors graduated from local institutions.

Network variables are defined to demonstrate director abilities in seeking and obtaining external resources and information from their social networks. We define political connections as a dummy variable that is equal to 1 if there is a former government, police, or military officer on board, and zero otherwise. The alumni network variable is defined as a proportion of directors who graduated from Chulalongkorn University, which is the most elite and longest established university in Thailand.

Considering board composition, board size is defined as the number of directors. Board

independence is measured by the fraction of independent directors. CEO duality is a dummy variable equal to 1 if the CEO also holds the position of chairman of the board, and zero otherwise. The percentage of executive and non-executive directors to total directors is also provided in the descriptive analysis.

We investigate the impact of board diversity, network, and composition on firm value, using a regression analysis. The model is controlled by industry and year effects as follows:

$$\begin{aligned} Firmvalue_{i,t} = & \alpha_{i,t} + \beta_1 Gender_{i,t} + \beta_2 Age_{i,t} + \beta_3 Edu_{i,t} + \beta_4 Major_{i,t} + \beta_5 Expertise_{i,t} + \beta_6 Inter_{i,t} \\ & + \beta_7 PolCon_{i,t} + \beta_8 Alumni_{i,t} + \beta_9 BoardSize_{i,t} + \beta_{10} Independence_{i,t} + \beta_{11} Duality_{i,t} \\ & + \beta_{12} Size_{i,t} + \beta_{13} Leverage_{i,t} + \beta_{14} Firm\ age_{i,t} + \beta_{15} Sales\ growth_{i,t} + \beta_{16} Ind_{i,t} + \beta_{17} Year_{i,t} + \varepsilon_{i,t} \end{aligned}$$

Firm value is measured by the market to book ratio (a proxy of Tobin's Q ratio), which is the ratio of market value of total assets to book value of total assets. Our main independent variables include board diversity and network as discussed in the previous section. We also introduce several variables into our analysis to control for board composition, firm characteristics, and industry and year effects. Board composition includes board size, board independence, and CEO duality. Firm characteristics include size (proxied by the log of sales), leverage (proxied by the ratio of total debt to total assets), firm age (proxied by the number of years since establishment), and sales growth (proxied by the annual change in sales).

4. Findings

Table 1 shows that gender diversity is low in Thai boardrooms. Only about 16% of total directors are female. Nevertheless, around three quarters of the sample firms have at least one woman on the board. Concerning director age, the results show that the average age of directors is roughly 55 years old, with the youngest average age of around 40 years old and the oldest average age of around 70 years old. When separating director age into five cohorts, we find that directors who are in the range of 51-60 years old are appointed most often, with the average number of four directors and the maximum number of 18 directors per board. Moreover, about 95% of companies have at least one director who is in the 51-60-years-old age cohort. Interestingly, directors who are younger than 40 years old occupy only one board seat on average. Nonetheless, these young directors are appointed by almost 60% of firms. As for age diversity measure, the mean value is 0.59 (median, 0.62), while the highest value is 0.78.

Regarding educational levels of directors, almost 10%, 40% and 35% of directors have the highest degree of a doctoral, master's, and bachelor's degree, respectively. Diversity in educational levels is similar to diversity in age. Specifically, the average diversity index is 0.57 (median, 0.59) and the maximum is 0.75. The results of study majors of directors show that business administration is the most frequently found academic major on the board, followed by accounting/finance/economics and engineering/science, respectively. It is interesting to find that law is one of the least commonly found study areas in our sample. Diversity

measure of educational majors appears to be higher than that of educational levels. More precisely, the mean value of diversity measure of study majors is 0.65 (median, 0.68) with the maximum value of 0.82.

As expected almost all firms have a director with some business expertise, while roughly 60% of the firms have a director with accounting, financial, or economics skills. Consistent with the results of educational background, only 20% of firms appoint a director with legal experience. Also, academicians are appointed as director in less than 10% of firms. Compared with other diversity indices, expertise diversity index is the lowest. The average is 0.4 (median, 0.42) and the highest is 0.79. This result shows that expertise of directors is not as diverse as study areas. Furthermore, on average, about 60% of the directors have studied overseas. As a diversity measure of international perspectives, the average ratio of the number of directors with international education to the number of directors with local education is 2.13 (median, 1.4). The ratio ranges from 0 to 18.

Considering networks of boards of directors, interestingly, a large number of Thai listed firms appoint directors who were in government sectors. Approximately 70% of the sample firms appoint former bureaucrats as the directors. As for the network through education from alumni of the most prominent university in Thailand, about 15% of the directors are alumni of Chulalongkorn University.

In terms of board composition, the results show that the average number of directors on board is around 11, with the minimum of five (as stipulated by the law) and the maximum of 25. Independent directors account for about one third of total directors, which is consistent with the regulation by the SET. This may imply that listed companies appointed independent directors only to meet the minimum requirement. However, when considering the fraction of external directors (i.e., independent and non-executive directors), these directors consist of roughly 60% of total board seats, which is the majority of the board. We also find that almost one quarter of Thai companies combine the CEO and chairman positions.

Variables	Mean	Standard deviation	Median	Min	Max
Board characteristics					
Gender:					
Percentage of firms with female directors	78.21	-	-	-	-
Percentage of Female directors	16.22	14.16	13.64	0	75.00
Age:					
Average age of directors	55.52	4.78	55.67	40.08	70.17
No. of directors who are					
- Less than 30 years old	0.11	0.36	0	0	3
- 31-40 years old	0.86	1.05	1	0	6
- 41-50 years old	2.70	1.84	2	0	11
- 51-60 years old	4.07	2.47	4	0	18
- Older than 60 years old	3.71	2.67	3	0	12
Percentage of firms with directors who are					
- Less than 30 years old	8.95	-	-	-	-
- 31-40 years old	52.61	-	-	-	-
- 41-50 years old	91.91	-	-	-	-
- 51-60 years old	95.88	-	-	-	-
- Older than 60 years old	91.21	-	-	-	-
Diversity in age	0.59	0.11	0.62	0	0.78

Educational levels:					
Percentage of directors who have					
- Below bachelor's degree	14.04	14.41	10.00	0	87.50
- Bachelor's degree	36.77	19.11	36.36	0	92.86
- Master's degree	39.37	19.45	37.50	0	100
- Doctoral degree	9.81	10.91	8.33	0	66.67
Diversity in educational levels	0.57	0.11	0.59	0	0.75
Study majors:					
No. of directors whose study major is					
- Accounting, finance, or economics	2.82	2.21	2	0	16
- Business administration	3.43	2.36	3	0	13
- Law	0.79	1.05	0	0	8
- Engineering or science	2.86	2.97	2	0	30
- Medicine	0.37	1.26	0	0	11
Percentage of firms with directors whose study major is					
- Accounting, finance, or economics	88.02	-	-	-	-
- Business administration	92.68	-	-	-	-
- Law	49.88	-	-	-	-
- Engineering or science	82.80	-	-	-	-
- Medicine	15.33	-	-	-	-
Diversity in study majors	0.65	0.13	0.68	1	0.82
Expertise:					
Percentage of firms with directors whose expertise is					
- Accounting, finance, or economics	59.61	-	-	-	-
- Business administration	98.99	-	-	-	-
- Law	21.25	-	-	-	-
- Engineering or science	35.64	-	-	-	-
- Medicine	28.72	-	-	-	-
- Academics	8.16	-	-	-	-
Diversity in expertise	0.40	0.20	0.42	0	0.79
International perspectives:					
Percentage of directors who have international education		-	-	-	-
Diversity in international perspectives	2.13	2.36	1.4	0	18
Political connections:					
Percentage of firms with directors who are a former government, police or military officer	68.79	-	-	-	-
Alumni networks:					
Percentage of directors who are alumni of Chulalongkorn University	15.27	16.90	11.11	0	90.00
Board composition					
Size:					
: No. of directors on board	11.44	3.20	11	5	25
Independence:					
Percentage of executive directors	42.09	17.27	42.86	5.26	81.25
Percentage of non-executive directors	26.42	18.97	25.00	0	78.95
Percentage of independent directors	31.49	9.61	30.00	12.00	83.33
CEO duality:					
Percentage of firms with CEO duality	23.35	-	-	-	-

Table 1: Descriptive statistics of board characteristics and composition

	Model (1)		Model (2)		Model (3)	
Board diversity						
Diversity in gender	0.1016				0.0978	
	(0.431)				(0.449)	
Diversity in age	0.2577				0.2925	*
	(0.102)				(0.059)	
Diversity in educational levels	-0.3401	**			-0.3231	**
	(0.012)				(0.017)	
Diversity in study majors	0.2702	**			0.2389	**
	(0.024)				(0.046)	
Diversity in expertise	-0.1288				-0.1648	
	(0.178)				(0.122)	
Diversity in international perspectives	-0.0039				-0.0011	
	(0.545)				(0.862)	
Board networks						
Political connections			0.0228		0.0513	
			(0.539)		(0.229)	
Alumni networks			0.2838	***	0.2633	***
			(0.004)		(0.007)	
Control variables						
Board size	-0.0184	***	-0.0182	***	-0.0190	***
	(0.006)		(0.006)		(0.005)	
Independence	-0.1008		-0.1913		-0.1115	
	(0.677)		(0.409)		(0.640)	
Duality	-0.0117		0.0008		-0.0011	
	(0.780)		(0.985)		(0.980)	
Size	0.1027	***	0.0895	***	0.0965	***
	(0.000)		(0.000)		(0.000)	
Leverage	-0.2489	***	-0.2208	**	-0.2451	***
	(0.004)		(0.010)		(0.005)	
Firm age	-0.0031	*	-0.0030	*	-0.0028	*
	(0.055)		(0.061)		(0.084)	
Sales growth	0.1182	***	0.1179	***	0.1164	***
	(0.006)		(0.007)		(0.007)	
Year dummy	Yes		Yes		Yes	
Industry dummy	Yes		Yes		Yes	
No. of observations	1,285		1,285		1,285	
Adjusted R-squared	0.1795		0.1783		0.1836	

Table 2: The impact of board diversity and network on firm value

Table 2 shows the impact of board diversity and networks on firm value. Model 1 presents the regression results of the effects of diversity on firm value. In addition to board diversity, we investigate the impact of board networks on firm value as shown in Model 2. In Model 3, we combine variables of board diversity and networks.

Focusing on board diversity, the results of Model 1 and Model 3 show no evidence to support the impact of gender diversity on firm value. Hence we reject Hypothesis 1. These findings are consistent with Zahra and Stanton (1988), Shrader, Blackburn and Iles (1997), and Rose (2007). Model 1 also shows the insignificant result of age diversity. However, in Model 3, age diversity becomes positively significant to firm value, which supports Hypothesis 2. The significance level is marginal, though. The significance of age diversity to firm value is in line with McIntyre and Mitchell (2004) and Hagedorff and Keasey (2012). In both Model 1 and 3, we find that diversity in educational levels leads to lower firm value. The significantly negative relationship between the diversity in educational levels and firm value indicates that Hypothesis 3 is rejected. In contrast, the firm value is positively associated to the diversity in study majors. Thus, we accept Hypothesis 4. Nevertheless, the results show that diversity in expertise and international perspectives of boards are not significant to firm value. Thus, we reject Hypothesis 5 and Hypothesis 6.

In addition to board diversity, we investigate the impact of board networks on firm value as shown in Model 2. We find no supporting evidence about the impact of political connections on firm value; thus, we reject Hypothesis 7. However, the value of firms is positively associated with the proportion of directors with an alumni network, therefore, we accept Hypothesis 8. The network of directors who were graduated from the oldest and arguably most prestigious university seems to be beneficial to Thai firms; this result is consistent with the findings of Siegel (2007). In Model 3, in which we combine variables of board diversity and networks, the effects of board networks on firm value remain significant as shown in Model 2.

Regarding the aspects of board composition as control variables, we find the influence of board size on firm value in all three models. The number of directors on a board is negatively related to firm value. This implies that large boards might adversely affect communication and coordination in Thai firms and might not play an effective monitoring role as documented by Jensen and Zajac (1993) and Lipton and Lorsch (1992). Our findings concerning the impact of board size on firm value confirm the results of Eisenberg, Sundgren and Wells (1998), Mak and Kusnadi (2005), Van Ees, Van der Laan and Postma (2008), Van Essen, Van Oosterhout and Carney (2011) and Yermack (1996). However, the impacts of board independence and CEO duality on firm value are not significant in this paper, which is similar to previous research (Chen et al., 2008; Dahya et al., 2009; Daily and Dalton, 1997; Dalton et al., 1998; Van Essen et al., 2011).

The results of Model 1 to Model 3 also show that firm size and sales growth are positively associated to Tobin's Q ratio. The larger firms and firms with investment opportunity are more valuable. In contrast, we find that the leverage ratio and firm age are negatively related to firm value. The higher leverage ratio could lead to poor firm value, and the younger firms seem to have better growth opportunity to generate higher value.

5. Conclusion

Boards of directors are one of the most important mechanisms of corporate governance to monitor and advise top management. In response to the financial crisis in 1997, the SET has

recommended firms to appoint competent directors and has highlighted the importance of directors' qualifications and board composition. We investigate the board characteristics and their impact on firm value by introducing several measures of board diversity (gender, age, educational levels, study majors, professional expertise, and international perspectives) and networks (political connections and alumni networks).

The results show that the diversity in age and academic majors of Thai boards appears to be beneficial to firms, while diversity in educational levels adversely influences firm value. In 2006, the revised version of Principles of Good Corporate Governance added the principles about the structure of the board of directors. That is, a board should consist of directors with various skills, experience, and expertise that are useful to the company. However, we find that Thai listed firms are concerned about the importance of director diversity in different dimensions at the wake of the Asian financial crisis. Our findings also confirm that networks are one of the key institutional characteristics in emerging markets. However, we find only the value of the alumni network of an elite university in Thailand, not those of political connections. Board composition (size, independence and CEO duality) was also included, and the results show that smaller board size is more valuable to Thai firms, suggesting a more effective monitoring role.

Our findings have important implications that diversity and networking of human resources, especially directors, are important for firms in today's dynamic and competitive business environment. Given similar features of corporate governance among Asian countries (Globerman et al., 2011), our results provide additional evidence for relevant authorities to widen their viewpoints about corporate governance practices and human resource development in Asia-Pacific region. In addition, the findings are consistent with the direction of the best practices in enhancing board competencies and director qualifications.

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