ORGANIZATIONAL LEARNING AND ITS IMPACT OF FINANCIAL AND NON-FINANCIAL PERFORMANCE

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Abstract

This article aims to test the influence of organizational learning (OL) on financial (FP) and non-financial performance (NFP) at empirical level. On basis of previous theoretical and empirical foundations, structural and measurement sub-model was developed. Three latent constructs (OL, FP, NFP) were operationalised using 8 measurement variables (1 to 14-item aggregates). Based on sample of 220 Slovenian companies with more than 100 employees and self-reported questionnaire sent to top management, structural equation modeling technique was utilized to analyze data gathered. Following results emerged: (1) impact of OL on FP is statistically significant, positive and strong, (2) influence that OL has on NFP is also statistically significant, positive and strong and (3) FP and NFP do correlate. Article is concluded discussing implications for management, exposing some limitations and providing guidelines for future research in this promising area.

Keywords: organizational learning, organizational performance, Stakeholder theory, structural equation modeling.

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Suggested track: G (Organizational learning)

1 Introduction

In the new, knowledge based economy it is vital for business management to understand relationship between organizational learning and organizational performance. Organizational learning has emerged as one of the most promising concepts in strategic management already in late 1980s. As a premier researcher in the field of organizational learning stated…"the ability to learn faster than your competitors may be the only sustainable competitive advantage" (De Geus, 1988). This is why we develop a conceptual model relating those two issues and provide an empirical test in this article. In order to do so, we systemize and present definitions and process of organizational learning. In addition, we discuss traditional and modern

(Stakeholder theory and Balanced Scorecard) approaches to organizational performance measurement.

Article is structured into six main parts. First, model is conceptualized by presenting main constructs, relationships among them, setting hypotheses and operationalising constructs of concern. Second, in model specification phase, parameters for estimation are set and hypothesized path diagram constructed. Third, model identification deals with question of degrees of freedom and whether do we have enough data to estimate desired number of parameters. Fourth, data analysis begins with parameter estimation. In this context utilized sample is described and hypotheses tested. Fifth, model fit at global, structural and measurement level is assessed. Finally, results are discussed from modern managerial perspective. We conclude by exposing some limitations to our work and providing directions for future research in the area.

2 Theory – model conceptualization

In the first phase of our research, a conceptual model to test relationships among organizational learning, financial and non-financial performance is developed. This is done in two steps – first, conceptualization of structural sub-model and second, conceptualization of measurement sub-model.

2.1 Structural sub-model conceptualization

In order to develop a sound model, first, structural framework must be developed. This phase consists of two steps: presentation of constructs, and examination of possible relationships among them.

Three constructs of our interest will be Organizational learning (OL), Financial performance (FP) and Non-financial performance (NFP). OL could well be the most ambiguous part of the model due to absence of common understanding of the concept and virtual non-existence of unique definition. This statement can be supported with findings of Shrivastava (1983) and Dimovski (1994). According to the first author, vast majority of research in the area has been fragmentised and incomplete. The second author adds that research in the field of organizational learning resulted in numerous definitions and models (e.g. DiBella and Nevis, 1998; Nonaka and Takeuchi, 1996; Wall, 1998) that can be differentiated through criteria of inclusiveness, wideness and focusness. Dimovski and Colnar (1999) also state that most of definitions are only partial, because they deal with organizational learning from one theoretical perspective only. To present just a few of them – Senge (1990) defines organizational learning as ‘

a continuous testing of experience and its transformation into knowledge available to whole organization and relevant to their mission', while Huber (1991) sees it as a combination of four processes: information acquisition, information distribution, information interpretation and organizational memory. Argyris and Schön (1996) are even less restricting in their definition declaring that organizational learning emerges when organizations acquire information (knowledge, understandings, know-how, techniques and procedures) of any kind by any mean. Jones (2000) emphasizes importance of organizational learning for organizational performance defining it as 'a process through which managers try to increase organizational members' capabilities in order to understand better and manage with organization and its' environment to accept decisions that increase organizational performance on a continuous basis'. Dimovski (1994) provides an overview of previous research and identifies four various perspectives to organizational learning. His model manages to merge informational, interpretational, strategic and behavioural approach to organizational learning and defines it as a process of information acquisition, information interpretation and resulting behavioural and cognitive changes, which should in turn have impact on organizational performance.

How can we evaluate organizational performance? Rejc (2002) claims that it cannot be done without taking into consideration organizational goals. Modern business environment demands multi-goal orientation. Profit theory (Cyert and March, 1963) is no more valid measure of organizational performance and so are not other approaches that take into consideration only interests of shareholders (owners) of a company. Modern business environment is characterized with increased importance and strength of customers, employees and society in general. It has become quite obvious that within a modern company performance assessment, all stakeholders need to be taken into account. This is the main idea of Freeman's Stakeholder theory (1984, 1994). Already behavioural theory of a company (Cyert and March, 1963) recognized company as a coalition of individuals or groups of individuals such as management, employees, customers, owners, government etc but did nothing to introduce this affirmation to organizational performance assessment. Beside financial performance (FP) also non-financial performance (NFP) must be assessed in order to evaluate overall organizational performance of a modern company. According to Rejc (2002), there are two main reasons for such a requirement. First, several interest groups are involved in business and they all have their particular goals and expectations related to the company. They will remain in the coalition as long as their goals are satisfied in sufficient manner. Second, strategic business areas are not necessarily financial in

their nature. Several approaches to non-financial indicators selection exist, of which the most established is Balanced Scorecard – BSC (Kaplan and Norton, 1992, 1993, 1996, 1996a).

After defining constructs involved, next logical step in the process will be to examine relationships among them and set hypotheses to be tested afterward in the study. Influence of OL process on FP and NFP, and (non)-existence of correlation between FP and NFP is examined. Dimovski (1994) demonstrated positive impact of OL on both FP and NFP, using one-industry research design and stratified sample of 200 credit unions in Ohio. The study investigated determinants, process and outcomes of organizational learning, as well as relationship between organizational learning and performance. Sloan et al (2002), Lam (1998) and Figueireido (2003) also reached similar conclusions. When relationship between financial and non-financial performance is considered, empirical literature is scarce. In one of few empirical contributions, Chakravarthy (1986), found no statistically significant relationship between FP and NFP. On basis of this work hypotheses in Table 1 were set.

Table 1: Hypotheses

#	Hypothesis	Source
H1	Higher-level organizational learning (OL) leads to better financial performance (FP).	Dimovski, 1994. Lam, 1998. Sloan et al., 2002.
H2	Better organizational learning (OL) leads to better non-financial performance (NFP).	Dimovski, 1994. Figueiredo, 2003.
H3	There is no correlation between FP and NFP.	Chakravarthy, 1986.

1.2 Measurement sub-model conceptualization

In Table 2 model operationalisation is presented through inclusion of constructs, matching measurement variables, number of items involved and sources for underlying theories and measurement instruments.

Table 2: Specification of constructs – latent variables, their indicators, number of measurement items and their sources

Latent variables (constructs)	Measurement variables (indicators) and number of items aggregated into each	Sources
Organizational learning (OL)	Information acquisition (INFOACQ) - 12 Information interpretation (INTINF) - 11 Behavioural and cognitive changes (BCC) – 14	DiBella, Nevis, 1998. Dimovski, 1994. Nonaka and Takeuchi, 1996. Senge, 1990. Wall, 1998.
Financial organizational performance (FP) – perspective of owners	Return on assets (ROA) - 1 Value added per employee (VAEMP) - 1	Rejc, 2002. Freeman, 1984, 1994: Stakeholder theory. Kaplan and Norton, 1992, 1993, 1996, 1996a: Balanced scorecard. Chakravarthy, 1986.
Non-financial organizational performance (NFP) – perspective of other stakeholders	Stability of relationships with suppliers (SUPPLY) – 1 Net fluctuation of employees (EMPLOY) – 1 Customer complaints (BUYER) – 1	

OL construct will have 3 measurement variables: Information acquisition (INFOACQ), Information interpretation (INFOINT) and Behavioural and cognitive changes (BCC). When reporting on INFOACQ respondents were asked about importance of different sources of information (such as employees, previous decisions, external experts, clipping, competition, external data sources etc). Perceived importance of several ways to interpret information (personal contacts, teams, phone contacts, reports, memos etc) will be used to measure INFOINT. Behavioural and cognitive changes (BCC) will be aggregated using 14 items asking about last three-year changes in several areas (adaptability to pressures from external environment, quality of products and services, general atmosphere in company, efficiency of team meetings, speed of business etc). Financial performance (FP) will be measured with 2 one-item

measurement variables: Return on assets (ROA) and Value added per employee (VAEMP) in last three years relative to industry average, using bipolar scale. These results will reflect business performance from owners' point of view, even though we are well aware of all the problems related to ROA (such as 'creative accountancy'). Same approach will be used for non-financial performance (NFP) to capture perspectives of other stakeholders in a firm as a coalition of interests. 3 one-item measurement variables utilized are Stability of relationships with suppliers (SUPPLY), Net fluctuation of employees (EMPLOY) and Customer complaints (BUYER).

3 Methodology – Structural Equation Modeling

Methodology utilised to test our model will be structural equation modelling (SEM). This is a combination of confirmatory factor analysis (CFA) and econometric modelling, which aims to analyse hypothesized relationships among latent constructs, measured with observed indicators (measurement variables). Complete SEM model has 2 parts – structural and measurement sub-model. Important advantage that SEM has over multiple regression is that it allows for simultaneous testing of multiple endogenous (dependent) variables. On the other hand, SEM demands relatively large samples. Diamantopoulos and Siguaw (2000) propose at least 200 units as a rule of thumb, even though required sample size depends largely upon number of parameters to be estimated. In Figure 1 phases in the process of SEM are depicted.

3.1. Model specification and identification

In the model specification phase nature and number of parameters to be estimated is determined. We used LISREL (SIMPLIS) syntax. Next phase in the process is model identification, where we check whether do we have enough information to estimate desired number of parameters (Diamantopoulos and Siguaw, 2000). Model can be non-identified (too few observed variables to estimate all parameters), identified (here we can have problem with model testing) and over-identified, which is a desired state. Necessary, (although not sufficient) prerequisite for model identification, can be tested using following formula:

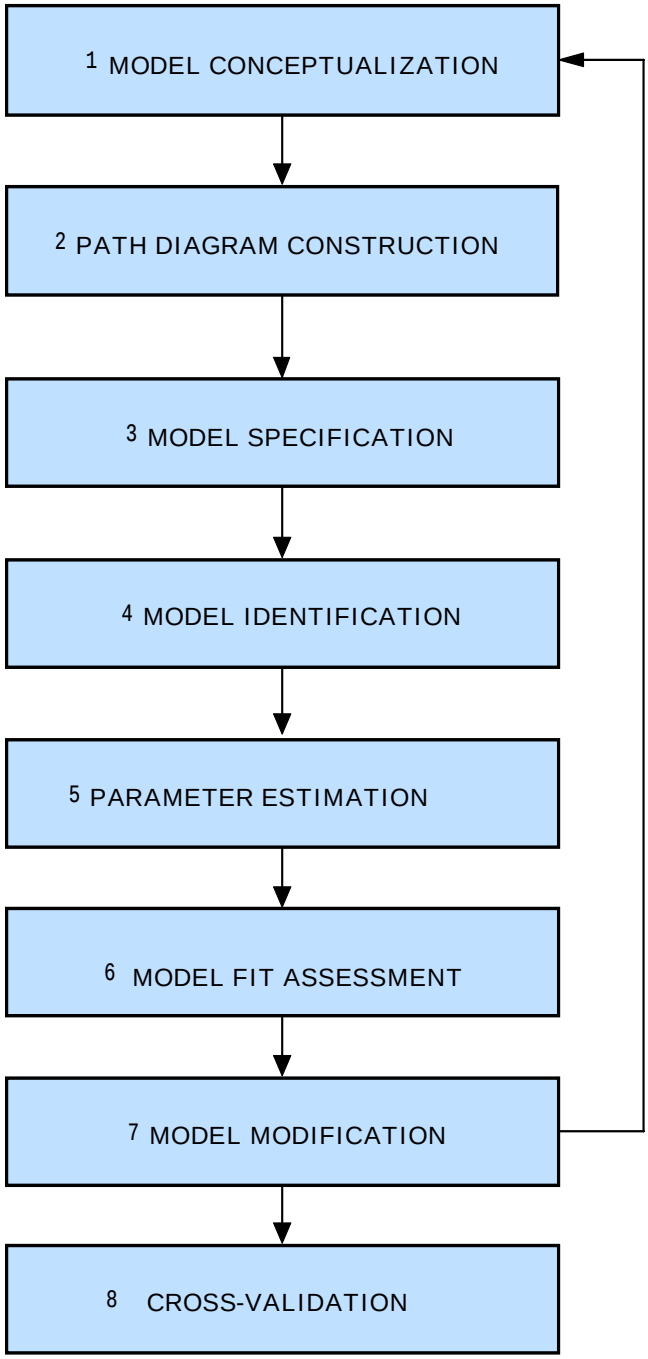
$$t<s/2$$

where t represents number of parameters to be tested (in our case 19) and s number of variances and covariances among indicators. s can be computed as

$$(p+q)*(p+q+1)$$

where p stands for number of indicators to measure exogenous latent variables (in our case 3) and q number of indicators for endogenous constructs (in our case 5). This means that s/2 equals 36, so our model can be regarded as over-identified and we can proceed to parameter estimation phase.

Fig. 1: Structural equation modelling phases



Source: Diamantopoulos and Siguaw, 2000.

3.2. Parameter estimation

Next phase in the process is parameter value estimation using LISREL (SIMPLIS) tool for structural equation modelling. Prior to data analysis, sample and data collection process are briefly presented.

3.2.1. Data gathering and sample

Based on model conceptualization, a measurement instrument – questionnaire was developed and sent in June 2003 to CEO's or board members of all Slovenian companies with more than 100 employees, which accounted for 867 companies. In first 3 weeks 234 completed questionnaires were returned. 14 of them due were excluded from further analysis due to missing values. Response rate was 25,4%, which can be considered as success in Slovenian context (using our primary data collection technique) and implies the fact that after 20 years, organizational learning still poses very important issue for practitioners as well as academia.

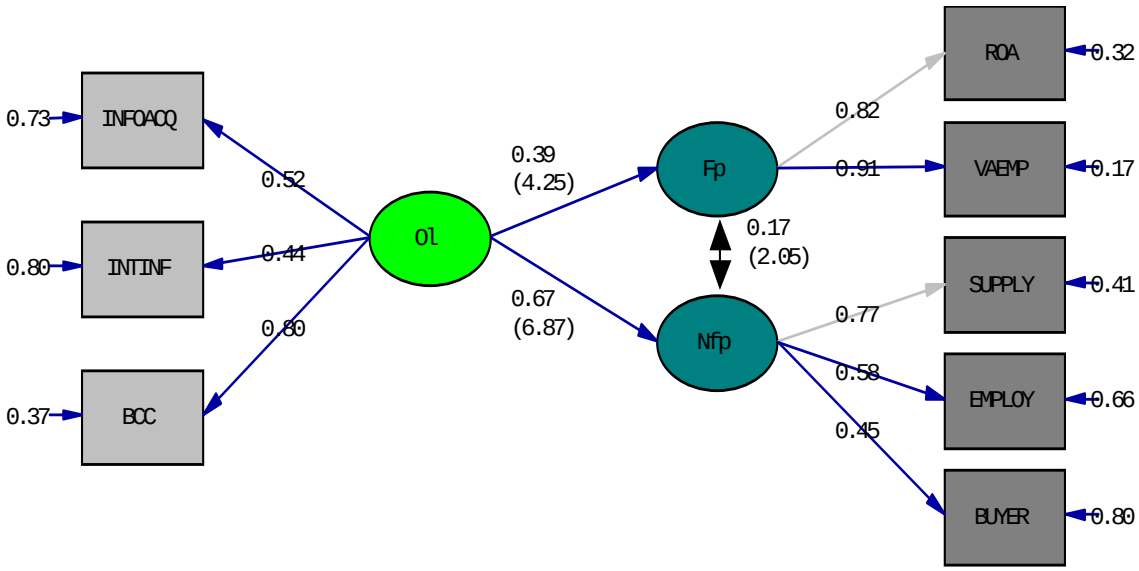
We aimed at audience of CEOs and middle management due to necessity to have a strategic and to some degree even interdisciplinary perspective on company in question. We have to be aware, though, that there will always be some degree of discrepancy between desired and actual structure of respondents. In our case, we managed to 'capture' successfully 67.3% respondents, while 21.8% did not reveal their identity and only 10.9% completed questionnaires failed to reach at least functional managerial level. Structure of our sample by company size is good representation of population of large Slovenian companies. Based on average number of employees criterion, in year 2002, 51.4% of the companies had between 100 and 249 employees, followed by 24.6% of the companies with 250 to 499 employed persons, 11.8% had 500-999 and 12.2% of the companies had 1000 and more employees.

3.2.1. Parameter value estimates

Maximum likelihood (ML) method was used to estimate parameter values. In this phase, hypotheses set in conceptualization phase, are tested. Even though several methods can be used for this purpose, ML is the most often used and has an advantage of being statistically efficient and at the same time specification error sensitive, because it demands only complete data and does not allow for missing values. All methods will, however, lead to similar parameter estimates under the

circumstance that sample is large enough and that the model is correct (Jöreskog and Sörbrom, 1993). In Figure 2 path diagram of our model (with completely standardized parameter estimates and corresponding t-values) is presented.

Fig. 2: Research model (completely standardized parameter values and t-values)



Organizational learning construct (OL) demonstrated statistically significant positive and strong impact on both Financial (FP) and Non-financial performance (NFP), which means that hypotheses 1 and 2 can be considered to have empirical support in data at hand. At the same time, correlation between FP and NFP, proved to be statistically significant, positive and moderate in size. Based on our data hypothesis 3 must be rejected. Not surprisingly, data gathered do not support Chakravarthy's (1986) findings stemming from research among 12 large UK based companies. On the contrary, surprising might be the fact that this impact is only moderate and not strong in its size.

3.3. Fit assessment

Model fit was assessed from three perspectives: (1) at global level (using several fit indices such as χ^2, Root mean square of approximation etc), (2) at level of structural sub-model and (3) at level of measurement sub-model (construct validity and construct and measurement variable reliability). Model fit relates to degree to which hypothesized model is consistent with data at hand - degree to which implicit matrix of covariances

(based on hypothesized model) and sample covariance matrix (based on data) fit (Bollen, 1989).

3.3.1. Global fit

Aim of global fit assessment is to determine degree to which model as a whole is consistent with data gathered. Through years, numerous global fit indices have been developed. To every researcher regret, none of them is superior to others. Different authors favour various measures. Diamantopoulos and Siguaw (2000) recommend using several measures and at the same time provide reference values for every one of them (Table 3).

Fit indices	**Model value**	**Reference value (condition)**	**Global model fit?**
χ^2 (level of significance p)	32,920 (0,0115)	p≥0,05	No
RMSEA	0,0628	< 0,100	Yes (Acceptable)
AIC	69,67	<AIC saturated model <AIC independent model	Yes Yes
CAIC	153,149	<CAIC saturated model <CAIC independent model	Yes Yes
Standardized RMR	0,0485	<0,05	Yes
GFI	0,965	≥0,90	Yes
AGFI	0,926	≥0,90	Yes
PGFI	0,456	≥0,50	No

Table 3: Fit indices.

Them most traditional value is χ^2 statistics. Using this fit indicator we test hypothesis that implicit covariance matrix equals sample covariance matrix. Our goal is not to reject this hypothesis. In our case this hypothesis must be rejected (at 5% level of significance) which might lead to (false) assumption that model is not completely acceptable. At the same time, all other indices lead to conclusion that model is

appropriate representation of reality. Root means square error of approximation (RMSEA) is the most wide spread measure of global fit and in our case points to acceptable fitness of the model. Akaike information criteria (AIC) and Consistent Akaike information criteria (CAIC) of the model need to be compared against AIC and CAIC for saturated and independent model, where smaller values represent better fit. Standardized root mean square residual (Standardized RMR) is fit index calculated from standardized residuals (differences between elements of sample and implicit covariance matrix). Goodness-of-fit (GFI) index, Adjusted goodness-of-fit (AGFI) index and Parsimony goodness-of-fit (PGFI) index are absolute fit indices which directly assess how well covariances based on parameter estimates reproduce sample covariances (Gebring and Anderson, 1993). All of the indices described above lead to conclusion that the model can be regarded as an appropriate approximation of reality (at global level). However, inappropriate χ^2 statistics demands further analysis of model fit at structural and measurement sub-model level.

3.3.2. Measurement sub-model fit

When assessing measurement sub-model fit, we focus on relationships between latent variables and their indicators (measurement, observed variables). Goal is to determine reliability and validity of measurement variables used to represent constructs of interest. Validity refers to degree to which indicator actually measures what it was supposed to measure, while reliability deals with consistency of measurement (Tabachnick and Fidell, 2001). Data for construct validity measurement can be obtained from LAMBDA-X and LAMBDA-Y (Appendix A) matrices for non-standardized parameter estimates. All t-values are larger than 1.96, meaning that construct validity is achieved in our case. For completely standardized parameter estimates goes that, greater the weight, more valid certain indicator for certain construct measurement is. Absolutely the most valid indicator in our model is Value added per employee (VAEMP), while the worst indicators are Information acquisition (INFOACQ) and Information interpretation (INFOINT). This might point out necessity to invest further efforts in operationalization of Organizational learning (OL) construct in future.

When reliability is an issue we need to address it in two steps: (1) reliability of individual indicators and (2) construct (composite) validity. Former is measured using R^2 for every single individual indicator and presents part of variance in an indicator explained by its latent variable. In our case, the most reliable indicator for OL is BCC, the most reliable

indicator for FP is VAEMP and the most reliable measure of NFP is SUPPLY. The most valid indicator in the model is VAEMP, while the least reliable measurement variable is INFOINT. For every single construct composite reliability can be calculated (in LISREL 8.53 still manually) using following formula:

$$\rho_c = \frac{(\sum \lambda_i)^2}{(\sum \lambda_i)^2 + \sum \theta_i}$$

where λ are indicator loadings and θ are variances of indicator errors (whether δ or ε). Data was obtained from completely standardized solution. It is desired that ρ_c exceeds 0.6 in order to be able to state that certain construct as a whole is reliable. In our case ρ_{OL} = 0.62, ρ_{FP} = 0.86 and ρ_{NFP} = 0.63. Based on these three calculations it can be said that composite reliabilities in our case are adequate. Construct FP is the pre-eminently operationalised, which was expected given the objectivity of the indicators involved in the constructs (as opposed to potentially subjective measures included into OL and also NFP and elusiveness of OL concept).

3.3.3. Structural sub-model fit

Next, we will focus on structural part of the model to establish whether hypothesized relationships among latent variables can be supported with data at hand. R^2 for FP equals 0,154, which is quite low value. We managed to explain variance of NFP construct much better using OL as an exogenous variable (R^2 = 0.545). If nothing else, this discrepancy proves the fact that inclusion of non-financial performance indicators in the model (and their separation from financial performance) was a reasonable and correct thing to do.

4. Discussion of results

Companies and their managers are in perpetual search for source of (sustainable) competitive advantage. In the new, knowledge based economy, where information and knowledge play crucial role, it is extremely important to put in force systematic efforts to achieve organizational learning of higher level, which we might name double-loop learning, strategic learning or generative learning. Our research demonstrated statistically significant positive and strong impact of organizational learning on both financial and non-financial organizational performance. Companies that will manage to develop organizational learning of higher level will gain in terms of higher profits and

value added per employee relative to its competitors. Beside that, relationships with their main groups of stakeholders will improve. Not surprisingly, correlation among financial and non-financial organizational performance proved to be statistically significant positive, but only moderate in its size. Evidently, companies of better financial health have more space to endorse better relationships with employees, customers and suppliers. Those groups of stakeholders are crucial for organizational effectiveness and efficiency in modern, network economy characterized with high interdependence of business subjects on the global level. Interestingly, companies that really care for their stakeholders demonstrated better financial performance.

All findings provided above reflect throughout whole modern paradigm of management process. In planning phase management needs to bear in mind goals of all stakeholder groups. Our research demonstrated that beside ethical, altruistic, reasons also very practical, financial ones were established. From managerial function of organizing point of view, one can say that situational variables of modern business environment demand organizational structure closer to organic type. Organizations, that will be more customer-oriented, that will covet for improvement of relationships with employees and optimization of supply chain, will perform better. To support learning, cooperation and empowerment of employees are tasks of a modern leader in a learning organization. Modern leaders need to endorse organizational culture of trust, cooperation and information sharing. This might be the place where ICT (e.g. intranet, virtual communities of employees etc.), reward systems and strong leadership can support organizational learning efforts. To be able to perform efficient and effective control in a turbulent environment, characterized with decentralization of knowledge and constant change, various information systems for control are compulsory to track results that organizational learning convey.

5. Conclusion

Main goal of our contribution was to develop theoretical and empirical framework to simultaneously test impact that organizational learning process has on organizational performance – in financial and non-financial terms. Using data for 100 Slovenian companies with more than 100 employees gathered in June 2003, 3 hypotheses were tested. Arguments for Freeman's Stakeholder theory proved to be ethical as well as purely financial in their nature. Companies that invest more efforts in achieving higher-level organizational learning gain both in financial and non-financial terms. These results are consistent with previous empirical research (Dimovski, 1994; Figueiredo,

2003; Lam, 1998; Sloan et al., 2002). In contrary to Chakravarthy's findings (but not surprisingly to us) profits achieved and value added correlate with quality of relationships with various groups of organizational stakeholders. It is both economically wise and ethically correct to cherish good relationships with employees, suppliers and customers.

We have to be aware of some limitations to our research and directions for future research stemming from those origins. First, sample size and context always pose important limitation. We used sample of Slovenian companies with more than 100 employees in year 2003. It would be very interesting and useful to introduce cross-cultural dimension in the context and to cross-validate model in different settings (e.g. EU countries, USA, Asian 'tigers' etc). Second, longitudinal study could provide some additional insights into issue of performance from higher-level organizational learning. Organizational learning might have even stronger impact with some kind of time lag. Third, we have to be aware of problems with operationalization of Organizational learning construct. By all means, to measure such an elusive concept poses big challenge to research community. Nevertheless, authors hope and believe that model developed and tested presents relatively well balanced relationship between complexity of organizational learning process and organizational performance in modern business environment on one hand, and simplicity of its formulation in the model on the other. Significant portion of work still lies ahead. Authors hope to have demonstrated importance of systematic efforts to achieve strategic, generative or double-loop organizational learning for strategic management of modern company in its perpetual quest for competitive advantage.

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APPENDIX A: LAMBDA X AND Y MATRICES (Non-standardized values)

LISREL Estimates (Maximum Likelihood)

LAMBDA-Y

	Fp	**Nfp**
ROA	0.873	- -
VAEMP	0.895 (0.123) 7.273	- -
SUPPLY	- -	0.582
EMPLOY	- -	0.579 (0.092) 6.298
BUYER	- -	0.337 (0.064) 5.249

LAMBDA-X

	OI
INFOACQ	3.443 (0.498) 6.912
INTINF	2.386 (0.409) 5.827
BCC	5.499 (0.550) 10.001