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# An Analysis of Voluntary Disclosure of Performance Indicators by Canadian Universities

Michael Maingot and Daniel Zeghal*
*University of Ottawa, Canada*

Managing by performance indicators (PIs) is an important and controversial issue for many stakeholders concerned with higher education in the university systems all over the world. This study analyzes the voluntary disclosures of PIs by Canadian universities. The sample consisted of the 44 universities used by Maclean's Canadian Universities ranking, which divide the universities into Primarily Undergraduate, Comprehensive, and Medical-Doctoral. We were able to identify 123 PIs which were regrouped in 18 categories. The top two categories were disclosures about research and finance which are not surprising since research and the financing thereof appear to be the mission of most universities. The larger universities in the Medical-Doctoral category appear to engage in a much higher level of disclosure of PIs than the Comprehensive and Primarily Undergraduate categories. According to our results, voluntary disclosure of PIs is positively affected by university size and mission. These results seem to be consistent with disclosure theories, particularly political cost theory and legitimacy theory and with previous results in the corporate sector. They are relevant to different stakeholders concerned with higher education.

## Introduction

Performance indicators (PIs) are data, usually quantitative in form, but not always, that provide a measure of some aspect of an individual's or organization's performance against which changes in performance or the performance of others can be compared (Harvey, 2004). Although PIs have relatively precise meaning, the term has grown to mean any quantitative or qualitative data related to the activity of higher education institutions, universities, and colleges, whether or not they really do throw any light on performance (CAUT Bulletin, 1997). Yorke (1995) noted a tendency for PIs to be collected irrespective of the policy framework within which they are to be used.

*Corresponding author. University of Ottawa, Telfer School of Management, 55 Laurier East, Ottawa, Ontario, Canada K1N 6N5. Email: zeghal@telfer.uottawa.ca

University PIs, in Canada and elsewhere, are often strongly advocated by governments, administrators, and boards of governors in order to demonstrate public accountability. Accountability, especially in the public sector, requires administrators to provide information and explanations about their actions and decisions to their stakeholders over and above what is normally included in the audited financial statements (Normanton, 1971). There is a great interest in ensuring that universities are accountable for the effective and efficient expenditure of public funds (Gilbert, 1994). Finally, disclosure of PIs reinforces good governance and has the potential of improving public trust.

*Objectives*

The objectives of this paper are (1) to analyze the development of PIs in higher education, (2) to study the voluntary disclosure of PIs by Canadian universities, and (3) to identify some of the factors which could explain the different behavior among universities not only in Canada, but also the USA, Europe, Australia, and New Zealand.

## Accountability and Good Governance

Higher education in Europe, North America, Australia, New Zealand, and other countries is pressed for greater accountability and quality. Traditional academic understandings of quality are under siege from market driven, corporate style criteria, measured and controlled by accounting and managerial techniques imported from the private sector. The concepts of accountability and quality assessment in higher education constitute an international phenomenon. National education systems call upon universities and colleges to establish PIs to measure progress towards the establishment of national goals (Kyrillidou, 2002; Neave, 1998). Universities increasingly are asked to describe, in specific terms, their contribution towards the national welfare and the relation between the welfare of a country and university teaching and research. Neave, in the context of higher education, calls this "the evaluative state" (Neave, 1988, 1998).

In Europe and Australia, central governments have been involved directly in developing "indicators". In the United Kingdom, for example, quality control, quality audit, and quality assessment are being carried out by the Higher Education Quality Council and the Higher Education Funding Council. The Higher Education Statistics Agency has been set up to gather and analyze the data collected. In the USA, there is a real push for higher education institutions to be judged by direct observable connection to the economic welfare of the country (Kyrillidou, 2002).

*Performance Indicators as New Public Sector Reform*

PIs were initiated internationally in the late 1970s and early 1980s as part of the "new right" way public-sector reform. Universities were consuming increasing

amounts of public resources following the post-war transition from elite to mass systems of higher education. They too would be subject to reform, and PIs would be the vehicles. Critics view this as an ideological attack on universities since this attack incorporates permanent reductions in government funding; harnessing university programs and research to commercial and labor markets; attenuation of tenure and academic freedom; and creeping privatization (Fisher, Rubenson, Rockwell, Grosjean, & Atkinson-Grosjean, 2000).

PIs have been introduced across the OECD countries. For many years, the OECD has published a list of indicators concerning activities in education, higher education, and research. These indicators relate to the entire system and focus on four quantitative topics: graduate output; financial and human resources earmarked; participation by the population; and school organization (Tavenas, 2004).

France, Britain, The Netherlands, Scandinavia, Australia, and New Zealand have longstanding systems in place, while Mediterranean countries and those of central and eastern Europe are in the process of establishing them (Brennan, 1999). Some federal systems like Germany, the USA, and Canada still stand apart, but their individual states and provinces are taking the initiative (Brennan, 1999; Woodhouse, 1996).

**Quanitfiable Measures Versus Non-Quantifiable Measures**

The adoption of PIs inevitably influences the internal lives of universities and colleges. As Newson (1998, p. 113) points out, criteria such as "efficiency", "productivity", and "accountability" are embedded in the routine day-to-day decision-making that takes place in "local" units throughout the university. Decisions are based on numbers generated by performance monitoring systems, but numbers are not as "objective" or "factual" as they appear. Furthermore, reliance on what can be quantified neglects more complex social variables that resist measurement (Harris, 1998; Newson, 1992).

Quantification, according to Fisher et al. (2000), is the language of half the academy—the natural and applied science, parts of the social sciences, and many of the professional disciplines and fields. But for the other half of the academy—the arts, humanities, and qualitative social sciences—quantification is an alien tongue. In terms of what constitutes "quality" for these disciplines, PIs (or models) are attempting to measure the unmeasurable. How are we to attach meaningful indicators to works of art, performance, or literature?

**The Challenges**

One danger of the reliance on PIs is that "targeted goals", as reflected in indicators, often become ends rather than means (Harris, 1998, p. 136). According to Baker (1997), PIs, together with self- and peer-review inspection, constitute the three generic approaches to performance models. Baker describes PIs as the expert of

these three systems, versatile in use and adaptable to a wide variety of internal and external purposes and are generally quantitative in nature. Criticisms of PIs tend to focus on their tendency to prefer the measurable to the unmeasurable and difficulty of linking measurable outputs to inputs and processes in higher education. Advocates argue that PIs provide outsiders with a means of judging the "quality" of a program without actually participating in it (Baker, 1997, p. 8). PIs are of interest to a wide range of bodies including government, universities, and colleges, and higher education funding bodies. The indicators are also relevant to schools, prospective students, and employers (HEFCE, 2003). They are the cornerstone of good governance mechanisms in the universities.

As a result, some governments are introducing PIs incrementally, requiring universities to generate an increasing amount of quantitative data for intermediary bodies. Others have embedded PIs in institutional contracts or other forms of conditional funding (Fisher et al., 2000). But the UK took a further step by linking the amount of research funding to performance scores of academic departments (El-Khawas, DePietro-Jurand, & Holm-Nielson, 1998, p. 9). The UK uses the Research Assessment Exercise (RAE) to distribute public funds for research, selectively on the basic of quality. The RAE provides quality ratings ranging from 1 to 5★ across all disciplines. The 5★ rating is the highest and most prestigious that a department can obtain. Therefore, the best research institutions receive a larger proportion of the available funding. Performance-linked funding is found in the UK, Australia, and New Zealand. Smeby and Stensaker (1999) found that the Nordic countries do not link assessment with resource allocation.

*University and College Ranking*

In higher education, university and college rankings are based on subjectively based perceived "quality" on some combination of empirical data, or on surveys of educators, scholars, prospective students, and others. Rankings are often consulted by prospective students and their parents. Rankings are conducted by magazines and newspapers. The *Times Higher Education Supplement*, a British publication, annually publishes a list of 200 ranked universities from around the world—The THES—Quality World University Rankings. Academic Ranking of World Universities is compiled by the Shanghai Jiao University to measure the gap between Chinese and "world class" universities. *Newsweek* magazine of the USA publishes annually a ranking of the top 100 Global Universities. In Canada, MacLean's magazine ranks universities on an annual basis. The European Union has also weighed in on the issue, when it compiled a list of the 22 European universities with the highest scientific impact (Tavenas, 2004). Whatever the rankings, they all face serious criticisms dealing with the nature of the assessment criteria and methodology. Since September 2006, over 20 Canadian universities, including several of the largest and most prominent, have refused to participate in the MacLean's survey. Despite the criticism, rankings of universities and colleges have increased the competition for entry at the higher ranked universities in Europe, Australia, New Zealand, Canada, the USA,

and the rest of the world. Universities use their rankings in their advertisements for recruiting students and high quality faculty members.

## The Importance of Performance Indicators

Traditionally, universities disclose only financial information, mainly the Budget and Financial Statements. Today, financial performance is no longer sufficient to report on an organization's achievement and success. In the corporate sector, many factors have contributed to the limitation of financial information. These include the following:

- Non-financial indicators have gained interest for managerial decision, particularly with the use of the balanced scorecard and the rise of intellectual capital. The balanced scorecard is being linked to PIs at Edinburg University in Scotland (Nelson, 2007).
- External users have been consistently asking for more information. External users are becoming more and more convinced of the relevance of non-financial indicators in predicting their investment strategy, characteristics, and performance.
- The Jenkins report (in the USA) and other initiatives by the accounting profession have made many suggestions to make some of this information available to the external users. Theses initiatives have been described as a transfer in the communication model from the traditional financial to a more comprehensive business model.

In the education sector, according to Gilbert (1994), meaningful PIs have great benefits. They can be used to inform and assess instructional effectiveness and ultimately improve education. Are the courses meeting the student learning objectives and outcomes? Are students gaining the knowledge, skills, values, attitudes, and behaviors as a consequence of taking the course? As far as the professors are concerned, do the PIs help them discharge their teaching and research responsibilities, increase student confidence and public trust and remove the threat of externally imposed and often meaningless statistical comparisons masquerading as PIs.

PIs development often employs an INPUT–PROCESS–OUTCOME framework. Inputs represent what universities start with—students, instructors, books, and buildings. Process refers to what universities do with the inputs—programs and instructional processes such as curricula, workload, organization of teaching, faculty/student contact, class sizes, etc. Outcomes are the cognitive and non-cognitive effects of the university experience on students—their knowledge, skills, values, attitudes, and behaviors including subsequent employment and incomes. The interaction of input characteristics and university structures and processes to create value-added outcomes all take place within our external environment or context (historical, regional, or political factors) which affect institutions but are beyond their control or influence (Gilbert, 1994).

Gilbert (1994) stresses that meaningful PIs link university structures and processes to student learning and development outcomes (basic university objectives or missions) independent of input characteristics. They demonstrate that the student

outcomes are truly the result of university activities and structures (program effects) rather than the result of inputs (selection effects) or exogenous influences such as economic conditions.

*Measuring the New Reality*

PIs are another form of measurement. We have always compared, evaluated, classified, sorted, and ranked on the basis of some criteria. What is of concern about PIs today is that they are increasingly being imposed upon systems from outside their boundaries. Also, the choice of both the reliability and validity of what to measure and how to measure it, is also rapidly moving outside the boundaries of the system under scrutiny (OCUFA, 1996, p. I)

We can see this happening in universities in Canada and other parts of the world. We see a process driven by bean—counters (accountants?) that threatens to substitute for academic judgment. Such a process has been underway in Australia since 1992, when the federal Government introduced the "academic quality assurance program" (Maslem, CHE, April 28, 1995). As mentioned earlier in Canada, it is Maclean's—a weekly published by Rogers Publishing Limited—that does the institutional ranking of universities. Maclean's ranking of Canadian universities began in 1992 and continues to be published every year since (OCUFA, 2005). There are many criticisms of the Maclean's ranking in Canada. One of the major criticisms is that the measures are either input characteristics (grades of entering students, number of books in the library) or dubious process measures (class sizes which are not strongly associated with student achievement and learning outcomes (Gilbert, 1994).

Some commentators believe that the great danger of PIs is that they will be used to attack departments, faculties, and individuals (CAUT Bulletin, 1997, p. 8). The new design of higher education has students as clients and the bottom line as the ultimate objective. To enhance profitability, universities are forced to use PIs and be attentive to the marketplace (Gilbert, 1994). A number of provinces in Canada have taken initiatives around PIs. For example, the government of Alberta suggests that it will provide performance funding for universities that meet three broad criteria: affordability to students and taxpayers; responsiveness to the province's economic, social, and cultural needs; and accessibility to students (Confederation of Alberta Faculty Associations ([CAFA, 1998]). But how are these broad outcomes to be interpreted by university administrators and faculty? A university's performance, as measured in terms of selected indicators, will determine whether it is rewarded or penalized (CAFA, 2000). In 1993, the Quebec government published its report "Indicateurs de L'Activite Universitaire".

An example of questionable PIs can be taken again from Alberta. The premier believes that the best PI is how many students get jobs when they graduate. What this is doing is shifting the responsibility for economic dislocation, the economic disasters we face, from the machinations of global capitalism to the universities. Now we are going to blame the educational institutions (Coulter, 1996, p. 4).

## Theory and the Determinants of Voluntary Disclosure of Performance Indicators

Voluntary disclosure in the business sector has been analyzed within a number of theories including the following:

(1) Agency theory and its application to accounting contractual theory suggest that voluntary disclosure reduce information asymmetry and therefore reduce agency cost (Jensen & Meckling, 1976).
(2) Signaling theory, according to Spence (1973): voluntary disclosure could be used by managers to signal to the market that their company is outperforming comparable businesses.
(3) Political cost theory: this theory suggests that voluntary disclosure may be used as an instrument to improve a company's image and to reduce its exposure to potentially undesirable regulation (Watts & Zimmerman, 1986).
(4) Legitimacy theory: within this paradigm, voluntary disclosure is used by companies to inform their stakeholders that they are behaving within certain socially accepted norms (Shocker & Sethi, 1974).

In the particular case of not-for-profit organizations, some studies have demonstrated that voluntary disclosure is the result of multiple factors interacting among each other (Coy, Tower, & Dixon, 1993; Hyndman & Eden, 2001; Likierman, 1992). These factors include regulatory oversight, market forces, cost of disclosure, the organizational structure, and corporate governance.

- *Regulatory oversight*: An organization's voluntary disclosure is influenced by legislation, accounting norms and market regulations. These regulations can be coercive in nature. The government can exercise its coercive powers directly or indirectly. It can enact laws and regulations that guide the disclosure of PIs. The government can also exercise its coercive powers indirectly, through institutions, or by establishing certain governmental policies. Alberta has already done so by restricting funding around PIs.
- *Market forces*: The Maclean's rankings offer students and parents a rare view into universities and give them a unique opportunity to make informed decisions on the comparative strengths of public universities across Canada (Maclean's Magazine, 2005, p. 32). Despite all the criticisms, students use the information published in Maclean's to help them choose their studies. In a way, the public information increases the knowledge and the choices of the potential students and decreases the level of asymmetric information. It is not unusual for the brightest high school students to receive telephone calls from deans of university faculties exhorting than to choose their respective university faculty.
- *Cost of disclosure*: From an economical perspective, managers will only disclose information on PIs if the advantages of such disclosures surpass the cost of disclosing the information. Another type of cost related to disclosure of PIs is the effect of such disclosure on competition. Today, the information may not be in the print form but in electronic form. The amount of information available from

each university varies from university to university. The information tends to be scattered. However, we found PIs for the University of Toronto in a complete publication consisting of 94 pages.

- *Organizational factors*: The structure of the university establishes the routines and procedures for identifying and responding to the disclosure of PIs. The organizational structure has a considerable influence on the levels of disclosure to the public. There are three factors which determine the level of disclosure: the culture of the university, the strategy, and the internal politics (Gibbins & Loewen, 2005). There is an added factor. The personality of the person in charge of disclosure will also influence the level of disclosure.
- *University governance*: Each university has a document that deals with its governance. It has become more and more necessary since the Enron debacle in the corporate sector.

## Literature Review

### UNESCO Indicators

In 2001, UNESCO produced a major study on higher education PIs. Carried out by Fielden and Abercromby (2001), this study sets out a fairly comprehensive list of indicators that may be taken into consideration at both state and institutional levels.

### OECD Indicators

For many years, OECD has published an annual compendium of indicators concerning activities in education, higher education, and research in its member countries.

Tavenas (2004), in his report, "Quality Assurance: A Reference System for Indicators and Evaluation Procedures", presented a list of 36 possible types of PIs for The Latin European Universities Group which includes Belgium (French-speaking community), France, Italy, Spain, Switzerland, Portugal, and Luxembourg.

Benjamin (1996) discusses the need for systems of PIs to measure important aspects of university operations. Comparison of three models makes clear that model choice yields fundamentally different PI systems.

Cave, Hanney, Henkel, and Kogan (1997) in their book give an updated account of the present use and status of PIs in British higher education, a decade after their controversial introduction into higher education policy (Cave, Hanney, & Kogan, 1991). The authors explore some key issues in the development of PIs and provide an overview of recent experience in the UK, the USA, the Netherlands, Australia, Germany, Finland, Sweden, and Norway.

David (1996) reviews how PIs are currently being used in several Commonwealth countries, the UK, Australia, and Canada and identifies some of the issues associated with PI development and application. Findings suggest that PIs need to be related to institution objectives, should be used with other measures, and can not presently be used to compare institutions in different countries. In his international

review, Brennan (1999) shows that performance models (indicators) in higher education all share some combination of seven stated purposes: (1) ensuring accountability for public funds; (2) improving the quality provision; (3) stimulating competition within and between institutions; (4) verifying the quality of new institutions; (5) assigning institutional status; (6) underwriting transfer of authority between the state and institutions; and (7) facilitating international comparisons.

Most of the literature in Canada and in some other countries focuses on financial disclosure with emphasis on generally accepted accounting principles. (In the UK—Statement of Recommended Practice: Accounting in Higher Education Institutions; Australia—Statement of Accounting Concepts; New Zealand—Statement of Public Sector Accounting Concepts; Canada—CICA Handbook, section 4400.) New Zealand seems to be the leader with respect to much greater disclosure of both financial and non-financial information (Nelson, Banks, & Fisher, 2003; Dixon, Coy, & Tower, 1991). Since 1996, there have been several changes in the Canadian environment that has had an impact on the disclosure of information by universities. The Canadian Institute of Chartered Accountants (CICA) issued a new standard in March 1996, that applies to not-for-profit organizations including Canadian universities. The requirement deals with universities issuing a cash flow statement and the recording of depreciation. This is financial disclosure, not non-financial disclosure.

The study by Nelson et al. (2003) looked at "Improved Accountability by Canadian Universities", but focused more on the accounting requirements. The article by Gilbert (1994) examined what PIs are and are not. He explored the distinction between what PIs are in the context of the university and how they can be used or misused.

## Research Methodology and Results

### Sample

Our study is based on the 44 universities used by Maclean's. Twenty universities in the Primarily Undergraduate category are largely focused on undergraduate education, with relatively few graduate programs. Nine universities in the Comprehensive category have a significant amount of research activity and a wide range of programs at the undergraduate and graduate levels, including professional degrees. Fifteen universities in the Medical-Doctoral category have a broad range of PhD programs and research.

### The Measure of Voluntary Disclosure

We started with a list of voluntary disclosure items compiled by the University of Ottawa, Institutional Research and Planning Department. The list is titled: A Survey of PIs Used by Many Canadian Universities. This became our pilot list. However, after this stage, we examined the Web sites of the 44 universities in our sample in January 2006 in order to locate the voluntary disclosures of their PIs. We were able

to update the initial list and to identify a total of 123 PIs, regrouped in 18 categories.[1] A list of these categories can be found in Table 1. An examination of Table 1 reveals that the highest disclosures (24 of the total PIs of 123 disclosures) are disclosures about research and 21 (the second highest) are related to finance. Why is this? We believe that universities are emphasizing research as an important mission and disclosing the sources of finance to achieve this mission seems to go hand in hand with the research focus. The lowest scores pertain to environmental highlights and non-quantifiable indicators disclosure.

*Analysis of the Disclosure Measures*

Table 2 presents an analysis of disclosure for the 18 categories showing the minimum, maximum median, and mean scores for each category as well as the standard deviation. The highest levels of disclosure are for research, finance, student demand and recruitment, library services, student retention and completion rate, student diversity, and utilization of resources.

*Effect of the University Mission and Objective on the Level of Disclosure*

To analyze the effect of the university mission and objective on the level of disclosure we adopted the categories used in Maclean's. We performed an ANOVA analysis for the three categories of universities. The mean disclosure level for the Primarily

Table 1.   Disclosure categories

|    | Categories | Maximum score |
|----|------------|---------------|
| 1  | Student demand and recruitment | 9 |
| 2  | Student retention and completion rate | 5 |
| 3  | Student distribution | 4 |
| 4  | Research | 24 |
| 5  | Library resources | 7 |
| 6  | Class size | 2 |
| 7  | Availability of part-time/distance instruction | 4 |
| 8  | Utilization of resources | 7 |
| 9  | Employment and employment equity | 4 |
| 10 | Advancement | 4 |
| 11 | Finance | 21 |
| 12 | Financial accessibility | 6 |
| 13 | Student diversity | 6 |
| 14 | Employment rates, student achievement | 7 |
| 15 | Environmental highlights | 1 |
| 16 | Coop programs | 5 |
| 17 | Performance indicators non-quantifiable | 1 |
| 18 | Governance | 6 |
|    | Total | 123 |

Table 2. Analysis of disclosure by category

| N | Categories | Min | Max | Med | Mean | (Std Dev) |
|---|---|---|---|---|---|---|
| 1 | Student demand and recruitment | 0 | 6 | 2 | 2.4 | 1.6 |
| 2 | Student retention and completion rate | 0 | 5 | 0 | 0.5 | 1.1 |
| 3 | Student distribution | 0 | 4 | 0 | 0.9 | 1.1 |
| 4 | Research | 0 | 13 | 1 | 1.5 | 2.1 |
| 5 | Library resources | 0 | 6 | 1 | 1.3 | 1.2 |
| 6 | Class size | 0 | 2 | 0 | 0.3 | 0.6 |
| 7 | Availability of part-time/distance instruction | 0 | 3 | 1 | 1.3 | 0.9 |
| 8 | Utilization of resources | 0 | 5 | 0 | 0.3 | 0.8 |
| 9 | Employment and employment equity | 0 | 3 | 0 | 0.4 | 0.8 |
| 10 | Advancement | 0 | 4 | 0 | 0.6 | 1.0 |
| 11 | Finance | 0 | 13 | 5 | 5.4 | 2.2 |
| 12 | Financial accessibility | 0 | 4 | 0 | 0.4 | 0.7 |
| 13 | Student diversity | 0 | 5 | 1 | 1.0 | 1.0 |
| 14 | Employment rates, student achievement | 0 | 2 | 0 | 0.4 | 0.7 |
| 15 | Environmental highlights | 0 | 1 | 0 | 0.0 | 0.1 |
| 16 | Coop programs | 0 | 3 | 0 | 0.3 | 0.7 |
| 17 | Performance indicative non-quantifiable | 0 | 1 | 0 | 0.1 | 0.3 |
| 18 | Governance | 1 | 4 | 2 | 2.1 | 0.9 |
| | Total disclosures | 3 | 74 | 17 | 19.1 | 11.2 |

Undergraduate category is 14.05 with a standard deviation of 6.34; the Comprehensive category has a mean of 22.22 and a Standard deviation of 6.75; and the Medical-Doctoral category has a mean of 24.00 and a standard deviation of 14.90. The ANOVA test shows a significant difference with an *F* value of 4.323.

From the results, one can conclude that the level of voluntary disclosure of PIs is affected by the university mission: universities in the Medical-Doctoral category have the highest disclosure levels, followed by the group of Comprehensive Universities. Finally, the Primarily Undergraduate Universities have the lowest level of disclosure. The results seem to indicate that the more complex the mission, the higher is the level of voluntary disclosure.

*Effect of University Size on the Level of Disclosure*

The size of an organization has always been identified as a significant determinant of disclosure in the literature on voluntary disclosure. We tested for the presence of this effect using regression analysis. Two measures of size have been adopted (1) number of students, and (2) value of revenues.

According to Table 3, the results for the regression with the *Number of Students* were for all 44 universities in our sample, while the results of the regression with volume of *Revenues* were for 40 universities, since the information for 4 universities were not available. In both cases, the regression coefficients were highly significant

Table 3.    Results of the regression analysis of the effect of universities size on the level of voluntary disclosure

|  | Number of students 10,000 | Revenue $100 million |
| --- | --- | --- |
| Constant | 9.14 | 12.19 |
| Regression coefficient | 5.465 | 2.105 |
| Standard error | 0.8568 | 0.3855 |
| $p$ value | 0.0000 | 0.0000 |
| $F$ value | 40.68 | 29.82 |
| Significance | 0.05 | 0.05 |
| $R^2$ | 0.49 | 0.44 |
| $N$ | 44 | 40 |

and the regression model had a highly explanatory power. The $R^2$ for *Number of Students* regression was 0.49 whereas the $R^2$ for *Revenue* regression was 0.44. In both cases, the model explains almost half of the variability in disclosure. One can see from Table 3 that there is clearly a strong relationship between the size of the university, measured by the number of students (or total revenue), and the level of voluntary disclosure of PIs.

## Conclusion

Universities in Europe, North America, Australia, New Zealand, and in other countries are faced with greater accountability demands from a growing number of stakeholders. The new knowledge economy with its reliance on information technology heightens the need for measurable results. Against the background of the knowledge economy and the greater contribution that universities are expected to make to economic, social, and cultural development, the establishment and use of PIs, hopefully, will provide the universities and their leaders with support for decision-making and strategic monitoring (Tavenas, 2004). Given the nature of international competition and international rankings, universities feel the need to publicize their results on the basis of a few carefully selected indicators.

While government and administrators admit that it is difficult to measure the unmeasurable, PIs continue to expand and become more pervasive. The amount of voluntary disclosure in Europe, North America, Australia, New Zealand, and in other countries varies considerably. Performance funding and performance based budgeting are found in the USA, Australia, New Zealand, and the UK. PIs (models) in the Nordic countries try to balance institutional and societal needs and values. Some other European countries have developed a variation of the "softer" Dutch approach, involving quantitative as well as qualitative PIs.

In our empirical research on voluntary disclosure of PIs by Canadian universities, we found that Canadian universities are using and voluntarily disclosing 123 different non-financial PIs belonging to 18 categories. The large universities in the Medical-Doctoral category appear to engage in a much higher volume of non-financial PIs.

Voluntary disclosure of PIs are more frequent for research, finance, student demand and recruitment, library resources, utilization of resources and employment rates, student achievement followed by financial diversity, student diversity, and governance.

Research ranks number one while finance ranks number two. This might be due to the desire of most universities to be what is termed "research intensive". This might explain the high rankings of these two categories of disclosure. Overall, our results suggest that university size (measured by number of students or total revenues) has a strong positive effect on the level of voluntary disclosure of PIs. There is increasing pressure by the governments for accountability by the universities. Two provincial governments, Alberta and Ontario, are already linking university funding to PIs. The university professors' union is resisting this by arguing that university is not a business in the corporate sense and students are not clients or customers. In the overall, our results seems to indicate that voluntary disclosure of PIs is positively affected by the size of the university, its mission, and its objectives and are consistent with the dominant theoretical paradigms and with empirical research on voluntary disclosure in the corporate sector.

These results seem to concur with the latest OECD report on higher education released in April 2008 which recommended that governments play a more active role in steering universities and colleges. The report suggests that the development of PIs is a vital tool that government can use to face the challenges in higher education (CAUT Bulletin, 2008).

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## Note

1. The complete list of 123 PIs, 44 universities, and the full quantitative analyses can be obtained from the authors.

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