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**Author(s):** Eskola, Anne; Hundal, Shab

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# The Development of Funding Schemes at Finnish Universities of Applied Sciences

Anne Eskola and Shab Hundal

School of Business, JAMK University of Applied Sciences, Jyväskylä, Finland

Email: {anne.eskola, shabnamjit.hundal}@jamk.fi

**Abstract**— This article examines the development of funding schemes at Finnish universities of applied sciences (UASs) between 2012 and 2018. During that period, the rudiments of the financing of Finnish UASs changed from cost-based to performance-based funding schemes. In a performance-based funding scheme, the state allocates funding based on the achievement of predefined objectives. The reform was intended to improve the processes and structures of UASs and to increase their effectiveness. This study explores the development of funding schemes from simple cost-based funding schemes towards more complex performance-based funding schemes with many indicators of performance. The results of the study offer empirical evidence on the impact of funding schemes on the measures of the performance of UASs, interpretations of the research object in context and causal connections between the above-mentioned elements.

**Index Terms**—funding scheme, performance-based funding, higher education, university of applied sciences

## I. INTRODUCTION

The education level of the population boosts national economic performance, growth and well-being [1]–[3]. There is a constant need for more education and training (i.e. more people with higher-level skills) that is more diverse and more frequently updated, as skills are becoming outdated faster [2]. The three main targets of higher education are quality, efficiency and equity. Improving achievement of these targets requires that the incentives are in line with them. [4], [5]. The choice of the funding scheme for higher education in any country is important because the incentives form part of the funding scheme.

There is no such thing as an optimal funding scheme [6]; higher education is costly and funding schemes for higher education are reflections of political choices and targets set for higher education systems [1], [4], [6]. A good funding scheme is clear, and it encourages higher education institutions to aim for efficiency, quality and effectivity [7]. Achieving the targets is hard if the funding scheme does not encourage the achievement of targets and measure the higher education institution's performance against the targets set.

The amount of money allocated to higher education is the result of political debate dictated by social and economic realities and ranging from uniform, egalitarian systems to market-driven systems [4], which have been advocated [2]. At European level, there has been a shift

from general, public funding based on line-item budgets drawn up based on historical costs towards more transparent funding schemes with many criteria and freedom in the internal allocation of funds [6]. However, several prior studies [8]–[12] have questioned the effectiveness of both performance agreements and performance-based funding schemes. In many countries, performance-based funding schemes have failed because they have been uneven and unstable, as they tend to reduce the scope of strategic planning and the autonomy of higher education institutions [7].

This article describes the change of funding schemes in Finnish UASs during the period 2012–2018 and the impact this change has had on the performance of UASs. During this period, the cost-based funding scheme for UASs was rejected and new performance-based funding schemes were introduced. In a performance-based funding scheme, the state allocates funding based on the achievement of predefined objectives. The effect of such a funding scheme is very strong in a country like Finland, where, in general, no higher education tuition fees could be charged by higher education institutions to finance their operations. However, from 2017, incoming students from non-EU/EEA countries started to be charged tuition fees. This depicts a clear divergence from the long tradition of free education in Finland, though the amount of the revenue received by the institutions in the form of tuition fees' tuitions is still very moderate in the Finnish context.

The remainder of this article includes a literature review covering a general introduction to different higher education funding scheme options, a description of performance-based funding schemes and an introduction to the Finnish UAS context. The third section of the article includes a description of the data and methodology used to show the development of funding schemes of UASs during the period 2012–2018. The results and discussion section provide empirical evidence on the impact of performance-based funding schemes at Finnish UASs and interpretations of the research object. The concluding comments can be found at the end of the article.

## II. LITERATURE REVIEW

### A. Performance-based Funding Schemes

The main stakeholders of funding schemes are governments (or taxpayers), higher education institutions,

employers and students. Governments support higher education institutions because they aim at increasing social and economic welfare. [4] There are four main funding channels for higher education institutions: government allocations; grants and contracts from the government; grants, contracts and donations from private companies; and funding from students in the form of tuition fees. Allocation mechanisms can be based on historical criteria, input or performance indicators, or mathematical formulae. In real life, the allocation mechanisms usually combine the different elements to balance their respective advantages and disadvantages. [6]

The aims of higher-education institutions' performance-based funding are usually to boost productivity, increase quality and performance, enhance accountability and transparency [7], [13] and secure equity in the system, but what counts as performance is not clear. Performance could be defined as 1) goal- or problem-oriented, 2) results-based, 3) measured against pre-set standards (that are the result of a political decision or a negotiation process among stakeholders), or 4) a benchmark where a standard means doing better than others. [8]

The performance-based funding schemes link funding of a higher education institution to the achievement of political objectives. The funding schemes thus aim at improving performance and, on the other hand, set sanctions for poor outcomes. [7] The typical measures of performance or productivity in different countries are the number of degrees produced, number of study points, exam results or time spent in studies. Other, less-commonly used measures are those connected with employment, student feedback and internationalisation of teachers and students. Performance measures typical for research and development activities are usually the number of publications and external funding. [8] Output indicators have their shortcomings; quality is at risk because there is always a possibility of undesirable side effects with quantitative measures and, therefore, quality assurance mechanisms must be used at the same time [14].

There is an overarching trend in European higher education governance to increase the autonomy of higher education institutions [13], [15], [16]. The choice of funding scheme for any country involves decisions taken on autonomy versus government steering, differentiation between higher education institutions, weighting given to education and research, access to higher education, and efficient use of (usually limited) public money [6]. The aim in developing a performance-based funding scheme is usually gaining a more transparent and clearer system to increase the steering effect. However, the performance-based schemes are often complex and make the focus of assessing the effectiveness quite narrowly concentrated exclusively on measures in the scheme, instead of more comprehensive perspectives. [8] In addition to this, the autonomy is often debatable because, if the higher education institution wants to collect as much funding as possible, it should adhere to the funding scheme as closely as possible [16] and there is not much space for original strategies under the control of the financier [7].

If funding depends on projected outcomes, it is necessary to define whether the funding takes place before the achievement of targets set (i.e. performance) or afterwards – the first option usually involves some kind of clearance system. [5]

### *B. UASs in Finland*

Investments in education and research have traditionally been quite substantial in Finland, compared to OECD averages [17], but due to state budget cuts, the spending has been diminishing during recent years. However, with current levels of education, Finland meets both the EU target and the national target [18].

Finland uses a dual structure in higher education. This means that both universities and UASs provide higher education but have their own profiles. [19] There is evidence from many countries that the division between general and vocational orientation is not easy to maintain because, over the course of time, UASs tend to develop curricula that are more academic, whereas university education tends to get a vocational focus [6]. In Finland, traditional research universities emphasise scientific research and instruction, whereas UASs adopt a more practical approach emphasising professional competencies and offering shorter curricula [19], [20], but the boundaries are somewhat blurred.

The UASs are required to have a government-granted operating license and they are steered through higher education legislation, national development plans negotiated every four years, legally binding performance agreements, performance-based funding, and quality assurance measures. Higher education legislation has a strong steering impact determining what the higher education system looks like and what fields of education it offers [19], [21] and there is a direct link between the targets set in the performance agreements and the core funding allocated to the institutions [5]. Otherwise, the UASs are autonomous in deciding on administration, student admission, content of study programmes and the use of funding. [19], [21], [22] The multi-annual period guarantees stability, security and confidence [5], [8].

Finland has no higher education accreditation system but instead, the higher education institutions are themselves responsible for the regular evaluation of their own operations and outcomes. In this task, they get support from a national body or external accreditation agencies. In addition to this, each institution has been obliged to create its own quality system. The UASs are audited using thematic system-based external evaluations that are developmental in nature and aim to help institutions improve their operations, even though the result of quality assurance has no significance in the funding scheme. [16]

Despite the good reputation Finland had gained in international comparisons of education quality and outputs, there has been a growing perception in Finland that the country is losing ground in its knowledge producing capacity and competitive advantages based on a highly educated workforce [16] and there has been critical debate about education [23]. In 2015, the Ministry of Education and Culture ordered a study on the

functionality and performance of the Finnish higher education system with international comparisons to some other countries with the same kind of higher education system. The study suggested that there were, indeed, many problems: 1) long duration of studies, 2) slow transition from higher education to the labour market, 3) declining learning outcomes at school level, 4) small and ageing population, 5) weak internationalisation of higher education and research, 6) fragmented research output, 7) lack of large-scale research infrastructures, 8) absence of big national research goals and 9) fragmented and weakly profiled higher education system. [16]. Changes in funding schemes have involved attempts to tackle these observed weaknesses in the higher education system.

### III. METHODOLOGY AND DATA

This study examines the development of funding schemes of Finnish UASs during the period 2012–2018. The purpose of the study is to describe how different funding schemes have developed during the period that covers a shift from cost-based funding schemes to performance-based funding schemes and what implications this change has had in the performance of UASs. The study is qualitative and uses methods of the historical research tradition of accounting [24]–[27] where the relevant variable is time and the purpose is to understand and interpret the research object in its context and ponder causal connections to some extent [28], [29] (Fig. 1).

	Part of accounting thinking	Entirety of accounting thinking
Short period	<i>Precise and analytical description, explanation and interpretation</i>	General view of a limited period
Long period	Long trend of a limited phenomenon	General view of a long period

Figure 1. The method of the study (classified according to Näsi [24])

The data was collected from official education statistics, websites and white papers drawn up by 1) Statistics Finland, 2) The Ministry of Education and Culture, 3) The Ministry of Finance, 4) The Rectors’ Conference of Finnish Universities of Applied Sciences Arene and 5) The European Commission to evidence the effects the introduction of performance-based funding schemes on the output of Finnish UASs.

#### A. Funding Scheme Before 2014

Before 2006, the funding scheme of UASs was based mainly on costs. Between 2006 and 2014, the funding scheme calculated the number of students enrolled and gave standard tariffs for different disciplines reflecting different cost levels. The proportion accounted for by these metrics was 70%, while the remaining 30% of the funding depended on degrees granted. [30]

The proportion the state accounted for of total funding was approximately 42% and the community 58%. The government-granted operating licenses defined for each UAS the fields of education, student admission and

location. Internally, UASs were autonomous, managed by rectors and boards, but strategic development and financial steering was conducted by the financier, i.e. the state and communities. [31]

#### B. Funding Scheme 2014–2016

In 2014, the state became responsible for the basic funding of UASs instead of local authorities, and the operating licenses were renewed. The number of UASs declined through mergers. From the beginning of 2015, all UASs started to operate as corporations under public law (i.e. non-profit registered limited companies). This required a change in legislation. Operations as independent legal entities aimed at giving the UASs a more independent status and more flexibility, which had implications for the leadership model and decision-making. [16]

The new performance-based funding scheme (Fig. 2) ranked UASs based on indicators in the scheme and the result of each UAS was compared to the total result of all UASs, resulting in the share each UAS was granted. This was a zero-sum game. It was possible that if all UASs ameliorated their performance, none of them would get more funding. The calculations for the scheme were based on floating historical data so that the funding for 2014 was based on 2010–2012, because the data for 2013 were not yet available when the funding for 2014 was budgeted [7], [32].

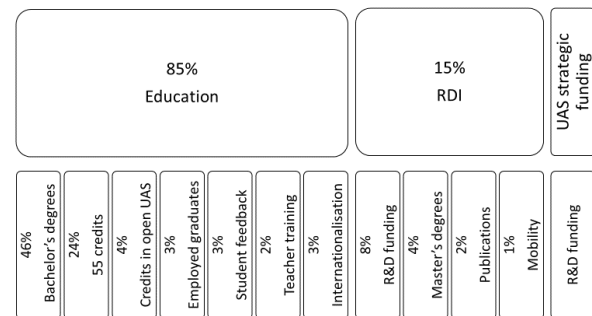


Figure 2. UAS funding scheme 2014–2016

In the performance-based funding scheme, 85% of funding was allocated according to indicators based on education and the remaining 15% was allocated based on research and development and innovation (R&D&I). Thus, the most important element was the productivity of the education process, however R&D&I operations were also included in basic funding. The funding scheme consisted of 11 measurements of which 70% were quantitative.

Education was divided into the following metrics: 1) the number of bachelor's degrees 46%, 2) the progress of studies measured by 55 European Credit Transfer System (ECTS) credits annually 24%, 3) study credits in open UAS 23%, 4) student employment 3%, 5) student feedback 3%, 6) degrees in vocational teacher training 2% and 7) internationalisation 2%.

The R&D&I activities accounted for 15% of the total of basic funding and they were divided as follows: external funding 8%, number of master's degrees 4%,

number of publications 2%, faculty and staff mobility 1%. The policy objectives accounted for 6% where 5% came from strategic funding and 1% from sector-specific funding.

C. Funding Scheme 2017–2021

In 2017, the funding scheme was revised [33]. This time, it was more about changing the coefficients than the scheme itself. The revised scheme (Fig. 3) decreased the coefficient of education but increased the weighting of strategic objectives, while the share for R&D&I measurements remained at same level as in the previous scheme.

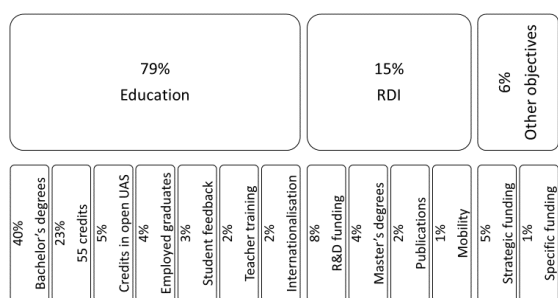


Figure 3. UAS funding scheme 2017–2021

In the revised performance-based funding scheme, education accounted for 79% of the total basic funding. Education was divided into the following metrics: 1) The number of bachelor's degrees achieved as agreed upon for the period of the performance agreement accounted for 40%. This represented the upper limit for the performance funding. 2) The progress of studies measured by 55 ECTS credits annually to shorten the duration of studies accounted for 23%. 3) Student employment accounted for 4%. Those employed as entrepreneurs had a double coefficient. 4) Education in open UAS accounted for 5%. 5) Student feedback accounted for 3% with issues of teaching and learning; international, multicultural and language learning activities; work life connections and tutoring; work placement; thesis; and overall satisfaction. 6) Degrees in vocational teacher education accounted for 2%. 7) The proportion international student mobility accounted for was 2%.

The R&D&I activities accounted for 15% of the total of basic funding and they were divided as follows: external funding 8%, number of master's degrees 4%, number of publications 2%, faculty and staff mobility 1%. The policy objectives accounted for 6%, where 5% came from strategic funding and 1% from sector-specific funding.

The strategic funding emphasised national higher education and research targets and the ability of a UAS to align its strategy with those targets. The criteria thus emphasised quick employment of graduates, social impact, regional impact and new research, learning and innovation environments among others. [33]

D. Future Trends

The third performance-based funding scheme (Fig. 4.) for UASs was introduced at the beginning of 2019 [34].

The scheme will come into force in 2021 and it will shift the focus from bachelor's degrees to master's degrees and lifelong learning. In addition to this, it will focus on quick graduation and R&D&I. The number of different components was reduced to nine comparing to the sixteen components of the previous funding scheme.

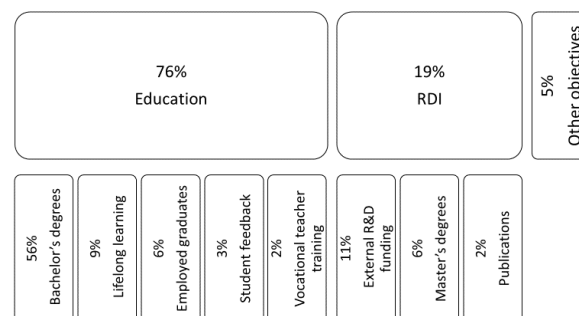


Figure 4. UAS funding scheme from 2021 onwards

Education accounts for 76% and it is divided into the following metrics: 1) 56% for bachelor's degrees, 2) 9% for lifelong learning, 3) 6% for number of employed graduates and quality of employment, 4) 3% for student feedback and 5) 2% for degrees granted in vocational teacher training. The proportion R&D&I activities account for will increase to 19% and is divided into three metrics: external funding 11%, master's degrees 6% and publications 2%. Other objectives account for 5%.

IV. RESULTS AND DISCUSSION

The cost-based funding scheme was predictable and simple in structure, and thus easy to use. On the other hand, it was also demotivating, because it did not reward UASs for effectivity or for meeting targets [30], instead, it motivated them to increase costs [35]. Prolonged study times and a substantial number of dropouts reflected this problem [31]. The scheme did not encourage UASs to specialise in R&D&I operations because it supported R&D&I very moderately. It was also very difficult to adjust the education offered to align with work life and employment requirements. [30]

The most important change happened in 2014 when the cost-based funding scheme was rejected. This change was in line with an international trend described by Lepori [6] since, historically, the general, history-based allocations with line-item budgets have been most popular, but the trend is now moving towards fund-seeking, competition-based strategies with global budgets and formulae based on incentives, which also means that the higher education institution itself decides the internal repartition of money. In addition to this, Barr [1] states that the days of central planning are gone because students are well-informed consumers who make choices that conform not only with their interests but also with those of the economy.

The performance-based funding scheme highlights indicators, i.e. the results the UAS is able to produce. The new scheme with its 11 measurements was complex compared to the previous two measurement schemes, but on the other hand, the basic funding scheme contained

funding elements for all operations of UASs as defined by law and tried to create a balanced combination of these different viewpoints.

Finnish UASs have always been characterised by the lower priority of research, an applied research orientation, customer-oriented topics, regional co-operation [6], and the low level and unclear status of R&D&I funding in the funding scheme [36]. The new funding scheme was supposed to stabilise the education and R&D&I operations despite fluctuations caused by economic cycles [31], since internationalisation plays an important role in UASs, which, in turn, has a strong link to R&D&I [37]. This created a very customer-driven R&D&I funding model in Finland, because only some basic level of funding was guaranteed to all institutions and most R&D&I funding was allocated based on performance measures or competitive funding benefitting largely from European structural funds [6].

Due to the transfer of the funding responsibility to the state, the municipal proportion of the funding (58%) was cut [31]. Between 2012 and 2015, due to the state of the public economy weakening [37] and gradual changes made to the funding scheme, the UASs lost a remarkable proportion, i.e. 350 million euros, of their funding. From 2015 onwards, the level of financing was about 200 million euros lower than in 2013. This caused almost all UASs to cut personnel numbers. [38], [39] Another reason for these cuts was the decline in age groups starting higher education [37]. Since the renewal of the funding scheme, i.e. between 2012 and 2018 (Table I), the UASs lost approximately one fifth of their financing [21].

TABLE I. BASIC FUNDING OF UNIVERSITIES OF APPLIED SCIENCES 2012–2018

Year	Euros	Change
2012	965,000,000	
2013	923,000,000	-4.35%
2014	905,000,000	-1.95%
2015	816,000,000	-9.83%
2016	859,974,770	-5.11%
2017	834,915,000	-2.91%
2018	826,250,000	-1.04%

The changes that happened in the funding scheme in 2017 and that will happen in 2021 were minor corrections to the coefficients used in the 2014 funding scheme. The number of different measures was 11 in the 2014 scheme, 13 in the 2017 scheme and it will be reduced to eight in the 2021 scheme. The proportion of basic education function shows a declining trend whereas the proportion of R&D&I is increasing with an increasing emphasis on external funding. Lifelong learning and work-life correspondence constitute a growing trend in the scheme, whereas internationalisation has been eliminated from the latest scheme, even though it is an important strategic target for all UASs. The elements relating to quality are

still lacking. de Boer and Jongbloed [5], [8] suggest that qualitative measures are avoided in funding schemes because they usually are less clear and transparent, their transaction costs are high, and their assessment is difficult. Quantitative measures create a sense of objectivity because they are more transparent and easier to assess.

The performance-based funding scheme was aimed at emphasising efficiency, quality and effectivity, and encouraging specialisation and centralisation of UASs with the intention of increasing the competitiveness of the whole economy. [32] The scheme has increased the efficiency of the operations of UASs (Table II) because the number of students and degrees produced have remained at the same level despite funding cuts. In addition to this, the UASs were pushed to fund their research through research programmes on regional development, which increased their ability to generate external funding

TABLE II. THE KEY FIGURES AND QUANTITATIVE TARGETS FOR UNIVERSITIES OF APPLIED SCIENCES (2018 FIGURES AND TARGETS SET)

	2012	2014	2016	2018
Bachelors' degrees	22,123	22,778	23,040	22,269
Masters' degrees	1,708	2,115	2,517	2,950
Degrees in vocational teacher training	1,740	1,849	1,795	1,600
Publications / person	0.61	0.85	n. a.	1.20
% share of graduates 5 yrs. from starting	60	60.3	n. a.	60
% share of students with 55 cr.	51.5	59	62.6	60

Despite there being no clear theoretical evidence about the relationship between performance-based funding and quality, productivity and efficiency in higher education [8], the government reported progress in strategic, institutional profiling of UASs, cost and performance awareness, governance systems and dialogue after the adoption of a performance-based funding scheme [33]. At the same time, the country failed to create a more diversified system because if institutions are rewarded in the same way for the same outputs as in Finland, they will seek the same ways of maximising their funding [8].

The cut in degree places in 2012 is reflected in figures describing the number of bachelors' degrees. The figure shows a decreasing trend even though the internal efficiency has increased due to degree places cut. As for other measures, the proportion of students who have gained at least 55 study points has increased remarkably.

Alongside the latest funding scheme, the Education and Culture Committee of the Finnish Parliament published a new vision on higher education and research for 2030. This vision states that the funding of UASs should be directed back into the growth trend to reach the targets expressed in the vision. The targets are, among

others, to increase the proportion of the population with a higher education qualification to 50% among those in the age cohort 30–34 years and to increase progress in higher education studies. Nowadays, 60% per age group start higher education studies but, because of slow progress in studies, only 41% get a degree. Another target is to decrease the number of higher education institutions while increasing their level. Finally, R&D&I funding should account for 4% of Finland's GNP. [18]

## V. CONCLUSIONS

A good funding scheme is clear, and it encourages the higher education institution to aim at targets that have been set. In Finland, the targets of equity and efficiency in higher education have been improving following the introduction of a performance-based funding scheme for UASs, but the aims linked to the target of quality are still hard to measure.

In Finland, the funding scheme for UASs changed from a simple cost-based input scheme to a complex performance-based output scheme with many measurements. The general funding for UASs still emphasises educational operations against research operations, the share of which of the total funding is still quite modest, and UASs are encouraged to seek research funding from external sources. At the same time, the proportion general allocations account for in the funding of UASs has diminished quite remarkably while the proportion other sources such as public project funding account for has increased. All these changes have made the funding scheme more market driven.

According to the statistics, the introduction of performance agreements has contributed to increased cost and performance awareness, even if UASs allocate the money in very different ways within the organisation. In this respect, the funding scheme leaves room for the internal autonomy of UASs. However, despite the changes made in the legal position of UASs as corporations under public law, a relatively high degree of state control still exists because the role of general allocations from the financier is considerable, which usually implies stronger state control.

As the performance-based funding scheme has succeeded in increasing the efficiency and effectivity of UASs, it neglects the element of quality. For example, if the results of all UASs were to decrease, it would be possible for one UAS to improve results even with a lower performance. In addition to this, since the performance-based funding scheme allocates the state funding as a lump sum and the proportion for each UAS is calculated based on its relative performance, the UASs compete against each other. If any UAS improves its performance in any of the indicators more than other UASs, it can increase its funding based on that criterion. In other words, it is possible to increase the financing only by improving on results more than other UASs. This may complicate co-operation between higher education institutions.

## CONFLICT OF INTEREST

The authors declare no conflict of interest.

## AUTHOR CONTRIBUTIONS

Anne Eskola conducted the research, analysed the data and wrote the findings. Shab Hundal verified the data and the results and contributed to the finalisation of the manuscript. Both authors had approved the final version.

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**Anne Eskola** holds a D.Sc. in accounting from the Jyväskylä University School of Business and Economics in Finland and an M.A. in French and English philology from Jyväskylä University, Faculty of Humanities. In addition to this, she earned a teacher qualification from JAMK University of Applied Sciences Vocational Teacher Education College in Finland. She works as a Principal Lecturer of Accounting and Finance at JAMK University of Applied Sciences. She has published many textbooks and scientific articles in the fields of higher education, organisational studies and accounting and finance during her twenty-year career in higher education. Her latest publication is an edited book "Navigating Through Changing Times – Knowledge Work in Complex Environments" (Routledge), which is based on the results of her research projects. Dr. Eskola is a member of the Finance Finland Academy and she has worked as an evaluator for the Finnish Education Evaluation Centre.



**Shab Hundal** holds a D.Sc. in accounting from the Jyväskylä University, School of Business and Economics in Finland. He is having two master's degrees; M.Sc. Financial Management, Aberdeen Business School, Robert Gordon University, Aberdeen, U.K, and M.Sc. (Honours School) Economics, Punjab School of Economics, Guru Nanak Dev University, Amritsar, India. He also holds Bachelor of Education (B.Ed.) at the secondary and higher-level education. He also had full registration as a secondary school teacher with the General Teaching Council of Scotland.

Currently, he is working as a Senior Lecturer of Financial Management at JAMK University of Applied Sciences. Before it, he worked at the Ministry of Education, Singapore; Aberdeen City Council and Aberdeenshire Council (UK), Marks & Spencer (UK) and British Telecom (UK). He has published several scientific articles in the fields of corporate finance and corporate governance. Dr. Hundal is a member of the Finance Finland Academy.