

Making the Most of Activity-Based Costing: Case of Compensation Management at a Korean Public University

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ABSTRACT

Activity-based costing (ABC) has been touted as being able to provide insights into profitability by segregating revenues and costs into the various activities that give rise to them. However, empirical findings on the performance benefits of ABC are mixed. This paper demonstrates how to make the most of ABC in evaluating costs of flexible, part-time versus committed, full-time teaching resources at a Korean public university. Unattractive compensation packages in academia is an issue of concern that leads to a range of problems from shortage of staff in academia to street protests and even suicides in South Korea. The structured, cause-and-effect approach of ABC provides insights into various avenues for improvement in the university's performance evaluation system and compensation packages to facilitate better deployment of flexible and committed teaching resources.

Keywords: activity-based costing (ABC) application, compensation, public institution, flexible resources, committed resources

INTRODUCTION

Compared with the traditional costing system, activity-based costing (ABC) has been found to provide more relevant information, which is beneficial in a

variety of ways ranging from making more accurate product-pricing and make-or-buy decisions to improved performance monitoring and evaluation (e.g. Ittner *et al.*, 2002; Maiga & Jacobs, 2007; Mishra & Vaysman, 2001). In the traditional costing system, indirect, overhead costs are typically allocated to products and/or services in an arbitrary manner, resulting in distortion of cost information. By contrast, ABC identifies the costs associated with

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the activities performed throughout the value chain from production to after-sales services. Costs are traced from the activities to the final products and/or services based on the products and/or services consumption of the activities performed. ABC facilitates detection of the actual costs of activities and resources consumed in producing, marketing, selling, delivering and after-sales services of products and/or services based on the cause-and-effect relationships throughout the value chain.

Extant literature records mixed findings on the benefits of ABC (e.g. Carli & Canavari, 2013; Cooper & Kaplan, 1991; Eldenburg *et al.*, 2010; Maher & Marais, 1998; Pike *et al.*, 2011; Sarokolaei *et al.*, 2013). While ABC constitutes a simple yet structured costing approach (e.g. Carli & Canavari, 2013), ABC does not necessarily result in more accurate and useful costs information (e.g. Cooper & Kaplan, 1991; Maher & Marais, 1998). As ABC assumes linear relationships between costs and activities that drive costs, ABC has been found to require modifications to accommodate the ambiguous, non-linear aspect of costs (Sarokolaei *et al.*, 2013). Further, getting the support of top management and being embedded in an organisation's employee compensation system do not necessarily guarantee acceptance and use of ABC (Pike *et al.*, 2011). Participation of all users in the design and implementation phase of ABC has been found to be pertinent for ABC to gain acceptance before the full potential

of the costing system can be realised (Eldenburg *et al.*, 2010).

Given the benefits and limitations of ABC, the objective of this study is to demonstrate how to make the most of ABC in the context of compensation management at a Korean public university. Extant literature suggests that compensation management in academia is an issue of concern (e.g. Campos-Arceiz *et al.*, 2013; Rivkees & Genel, 2008; White *et al.*, 2014). More specifically, compensation has been identified as one of the key reasons for a career in academia to be the least attractive among graduates (White *et al.*, 2014). Academics have been found to work long hours; academics tend to work after office hours and even over weekends (Campos-Arceiz, 2013). Expertise retained in academia is not only pertinent for traditional, basic research but also for major scientific breakthroughs and innovations (Iverson *et al.*, 2008). Yet, such expertise is dwindling as academics are leaving for more attractive compensation packages beyond academia (Rivkees & Genel, 2007). Concerns about compensation management in academia are particularly acute in South Korea where poor compensation packages not only drive academics away but also give rise to social ills such as street protests and even suicides (Kim, 2012; Park, 2010).

As compensation management in academia is particularly acute in South Korea, this study applies ABC to assess costs of flexible, part-time and committed, full-time resources at a public university in the country, especially when part-timers have claimed to

have been exploited (Park, 2010). This paper demonstrates the ability of ABC in providing a simple yet structured comparison of costs between part-time and full-time resources. The results revealed various avenues for improvement in the institution's performance evaluation system and compensation packages for better deployment of both full-time and part-time resources.

The remainder of this paper is organised as follows: the second section describes the mechanism that underlies how costs are assigned using ABC; the third section discusses the research setting and compensation as an issue of concern at a public university of interest in South Korea; the fourth section evaluates the compensation issue using ABC; and the final section summarises the paper and concludes the discussion.

Activity-Based Costing Model

ABC has been touted as a powerful costing model for a thorough understanding of profitability (e.g. Cooper & Kaplan,

1991). ABC is able to reveal how products, customers, facilities, regions or distribution channels consume resources. Using a two-stage approach, first, ABC identifies activity cost pools, i.e. activities and the costs required to perform the activities, in an organisation. In this study, the cost pools are salaries of individual academic staff, both full-time and part-time staff. Next, costs at each activity cost pool are assigned to teaching, research and other contributions using appropriate cost driver rates as per consumption of the resources. In this manner, not only direct costs such as costs of flexible, part-time resources are accurately assigned. Indirect costs such as costs of committed, full-time resources are also accurately assigned to teaching, research and other contributions. Being able to assign costs, both direct and indirect costs, as per consumption of resources facilitates understanding whether organisational resources are utilised efficiently and effectively. Fig.1 summarises how ABC assigns costs in the context of this study.

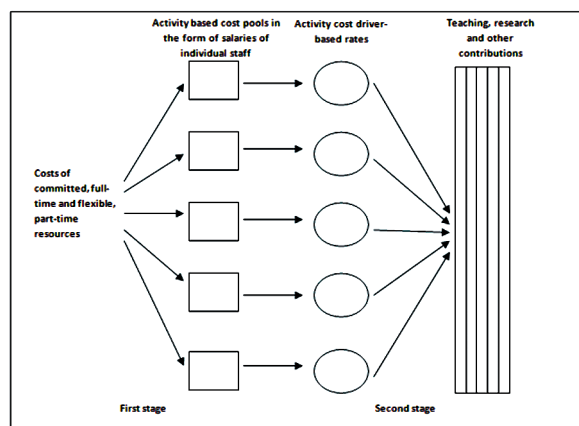


Fig.1. ABC's two-stage approach in assigning costs.

While the ABC approach in assigning costs better reflects consumption of resources, an indepth understanding of the activities and corresponding resources consumed is required to ensure appropriate choice of activity cost drivers and other assumptions that underlie cost assignment. Interviews with academic as well as administrative staff responsible for staff payroll and compensation management at the public university in South Korea were conducted to determine activity cost drivers and other assumptions that underlie cost assignment. As all manuals and documentation are in Korean, data were collected primarily via interviews, formal and informal, with academic and administrative staff who were comfortable conversing in English. Some of the written materials, which the university provided, were translated into English with the assistance of the administrative staff. Interview findings and details of how costs are assigned are discussed in the next section.

The Research Setting

The research site is a public university in South Korea established over 60 years ago. The university is one of the 10 flagship public universities in the country. The university consists of 13 faculties, namely humanities, social sciences, natural sciences, economics and management, engineering, agriculture and life sciences, law, pharmacy, medicine, human ecology, fine arts and music, veterinary medicine and bioscience and technology.

At the faculty of economics and management from which data for this research was primarily collected, part-time staff fulfilled approximately 40% of the faculty's teaching needs e.g. lectures, seminars, tutorials etc. at any point in time. Recruitment of part-timers to fulfil close to half of the teaching needs is a common practice across public universities in South Korea in line with shortage of full-time staff in academia. Besides delivering lectures, seminars and tutorials, part-time teaching staff are also expected to assess student coursework and set and mark examinations.

Full-time academic staff, who fulfil approximately 60% of the faculty's teaching needs, are responsible for not only teaching, assessing student coursework and setting and marking examinations. Their teaching responsibilities also include developing and implementing new methods of teaching to reflect changes in research, reviewing and revising curriculum to reflect latest development in research and practice and supporting students via their pastoral, advisory role as teachers and mentors.

Besides teaching responsibilities, full-time academic staff are required to undertake research, get their research published and actively contribute to the university's research profile. Full-time academic staff's research responsibilities also include supervising research students particularly at the postgraduate level, i.e. master's and doctoral level.

In addition to teaching and research, full-time academic staff are required

to juggle other activities especially administrative tasks related to student admissions and induction programmes, representing the faculty and/or university and contributing when deemed necessary at meetings, professional as well as research conferences and seminars, establishing collaborative connections with outsiders (e.g. industrial, commercial as well as public organisations), consistently engaging in continuous professional development and participating in staff training activities. Full-time academic staff with formal leadership roles and/or positions, such as course coordinator, head of department, deputy dean and dean, are required to manage and supervise staff who report to them.

The compensation issue

At the public university of interest, despite the wide range of duties and responsibilities full-time academic staff are expected to fulfil, their performance is broadly evaluated in terms of three components, i.e. teaching, research and other contributions. The weight assigned to each of the three components of performance are 6:3:1 for teaching, research and other contributions, respectively. Full-time academic staff have the privilege of flexible working hours. There is little information about how much of the individual resources are devoted to teaching, research and other contributions, respectively. However, individuals are expected to devote their resources based on the weight assigned to teaching, research and other contributions, respectively.

Hence, the weight was used as a basis to assign costs of full-time academic resources to the three activities, i.e. teaching, research and other contributions.

Of the three components of performance, teaching is the most structured and comparable across individuals; research and other duties and responsibilities are more diverse, less structured and vary to a greater extent across individuals. In terms of teaching, each full-time academic staff is required to teach three courses per academic year. Each course typically involves three hours of teaching per week (i.e. three credit-hour courses) and requires four weeks to complete. The base pay of full-time academic staff for each salary class is summarised in the first two columns of Table 1.

At the public university of interest, part-timers are paid an hourly rate of 42,500 won. As part-timers are involved in teaching alone, costs of flexible, part-time resources are direct costs, i.e. directly traceable to teaching.

Part-time teaching staff are claimed to be underpaid in South Korean public universities, where part-timers are believed to receive approximately one third of their full-time counterparts' pay (Park, 2010). Beyond public universities, part-timers are believed to receive approximately half of their full-time counterparts' pay. The widespread belief that part-timers are underpaid and exploited is a source of distress not only to the part-timers but also to the South

Korean government and policy makers. The belief that part-timers are underpaid and exploited is also claimed to be the cause of a series of suicide cases that has involved part-time teaching staff at public universities since 1999 (Park, 2010).

The widespread belief that part-time teaching staff are underpaid and exploited coupled with a series of suicide cases prompted the National Assembly of the Republic of Korea to consider revising the compensation scheme for part-time teaching staff at public universities in 2007 (Park, 2010). Two proposed revisions are believed to be relevant in ensuring fair compensation for part-time teaching staff. The first proposed revision is to raise the part-time hourly pay rate from 42,500 won to approximately 60,000 to 70,000 won. The second proposed revision is to include insurance coverage in part-timers' compensation scheme, i.e. pension, health, unemployment and industrial disaster insurance. However, part-timers have yet to see improvement in their compensation package despite living on the street for years since 2007 in protest (Park, 2010).

Unfair Compensation For Part-Time Teaching Staff?

This study applies ABC to assess whether part-time teaching staff are indeed underpaid and exploited. Teaching is the only common activity that both part-time and full-time staff perform. To ensure a fair comparison between costs of full-time versus part-time teaching

resources, first, the teaching component of full-time staff's salary was extracted. Based on the university's performance evaluation system, full-time academic staff are expected to dedicate 60% of their resources towards teaching consistent with the weight assigned to the three components of performance, i.e. 6:3:1 for teaching, research and other contributions, respectively. Hence, 60% of full-time staff's salary is deemed to compensate for teaching activities. Next, salary for the teaching component was converted to an hourly activity driver rate. Each full-time staff is required to teach three courses per academic year. Each course involves three hours of teaching per week and requires four weeks to complete.

Table 1 summarises the results of the calculation and comparison of hourly pay rate for teaching between full-time and part-time staff. Across the 33 salary classes, the part-time hourly pay rate of 42,500 won is higher than or close to two thirds of the salary classes' (full-time) hourly pay rate, i.e. salary class 1 to 21. At salary class 21, full-time academic staff have already established a reasonably steady track record of teaching, research and other contributions, not to mention the extra duties and responsibilities associated with teaching that their part-time counterparts are relieved of, such as reviewing and revising curriculum and guiding students in their position as mentors. Yet, these full-timers are compensated less on an hourly basis for teaching compared with their part-time counterparts.

TABLE 1
Compensation for Teaching

| Salary class ^a | Base salary ^b (won) | Salary for teaching component ^c (won) | Full-time hourly pay rate ^d (won) | Ratio of hourly pay rate: Part-time to full time ^e |
|---------------------------|-----------------------------------|---|---|---|
| 1 | 1,208,400 | 725,040 | 20,140.00 | 2.11 |
| 2 | 1,250,300 | 750,180 | 20,838.33 | 2.04 |
| 3 | 1,292,400 | 775,440 | 21,540.00 | 1.97 |
| 4 | 1,334,300 | 800,580 | 22,238.33 | 1.91 |
| 5 | 1,376,500 | 825,900 | 22,941.67 | 1.85 |
| 6 | 1,422,500 | 853,500 | 23,708.33 | 1.79 |
| 7 | 1,468,600 | 881,160 | 24,476.67 | 1.74 |
| 8 | 1,515,000 | 909,000 | 25,250.00 | 1.68 |
| 9 | 1,584,200 | 950,520 | 26,403.33 | 1.61 |
| 10 | 1,663,700 | 998,220 | 27,728.33 | 1.53 |
| 11 | 1,723,200 | 1,033,920 | 28,720.00 | 1.48 |
| 12 | 1,792,400 | 1,075,440 | 29,873.33 | 1.42 |
| 13 | 1,861,400 | 1,116,840 | 31,023.33 | 1.37 |
| 14 | 1,930,500 | 1,158,300 | 32,175.00 | 1.32 |
| 15 | 2,011,500 | 1,206,900 | 33,525.00 | 1.27 |
| 16 | 2,092,500 | 1,255,500 | 34,875.00 | 1.22 |
| 17 | 2,173,000 | 1,303,800 | 36,216.67 | 1.17 |
| 18 | 2,253,500 | 1,352,100 | 37,558.33 | 1.13 |
| 19 | 2,334,600 | 1,400,760 | 38,910.00 | 1.09 |
| 20 | 2,414,800 | 1,448,880 | 40,246.67 | 1.06 |
| 21 | 2,495,300 | 1,497,180 | 41,588.33 | 1.02 |
| 22 | 2,575,600 | 1,545,360 | 42,926.67 | 0.99 |
| 23 | 2,680,600 | 1,608,360 | 44,676.67 | 0.95 |
| 24 | 2,785,200 | 1,671,120 | 46,420.00 | 0.92 |
| 25 | 2,889,600 | 1,733,760 | 48,160.00 | 0.88 |
| 26 | 2,994,200 | 1,796,520 | 49,903.33 | 0.85 |
| 27 | 3,098,600 | 1,859,160 | 51,643.33 | 0.82 |
| 28 | 3,203,200 | 1,921,920 | 53,386.67 | 0.80 |
| 29 | 3,282,600 | 1,969,560 | 54,710.00 | 0.78 |
| 30 | 3,362,300 | 2,017,380 | 56,038.33 | 0.76 |
| 31 | 3,441,700 | 2,065,020 | 57,361.67 | 0.74 |
| 32 | 3,521,100 | 2,112,660 | 58,685.00 | 0.72 |
| 33 | 3,600,600 | 2,160,360 | 60,010.00 | 0.71 |

NOTES:

- The 33 salary classes apply to all full-time academic staff from the most junior entry level to the most senior professor level. There are four additional classes above class 33. The four additional classes are called “special classes”. The “special classes” are applicable to departmental heads, deputy deans and deans. As departmental heads, deputy deans and deans have more non-teaching related duties and responsibilities, the four special classes were excluded from analysis.
- Base salary of full-time academic staff compensates for teaching, research and other contributions for each academic year.
- Salary for the teaching component constitutes 60 % of base salary in line with the weight assigned to each component of performance, i.e. 6:3:1 for teaching, research and other contributions.
- Full-time hourly pay rate is the salary for the teaching component divided by 36 hours of teaching per academic year. Each full-time staff teaches three courses with 3 teaching hours per week for 4 weeks (3 courses x 3 hours per week x 4 weeks = 36 hours per academic year).
- Ratio of hourly pay rate is full-time hourly pay rate divided by part-time hourly pay rate of 42,500 won.

Revising the part-time hourly pay rate to approximately 60,000 to 70,000 won as proposed will lead to part-timers' pay for teaching to be equivalent to that of a typical full professor at the highest salary class of 33, who is not holding formal leadership roles and/or positions such as departmental heads, deputy deans and deans. If all part-timers who fulfil 40% of the teaching needs of the institution were in a position to provide insights into teaching in a manner equivalent to or better than those of a typical full professor at the highest salary class, then it would be worth considering revising part-time hourly pay rate to approximately 60,000 to 70,000 won.

The existing hourly part-time pay rate of 42,500 won is more than one-half of a typical full professor's hourly pay rate for teaching of 60,010 won. The claim that part-time teaching staff are underpaid and exploited when they receive approximately one third of their full-time counterparts' pay is not supported.

Further, part-time teaching resources are flexible resources whereas full-time teaching resources are committed resources. Increase in part-time hourly pay rate will immediately translate into increase in costs if the institution continues to rely on part-time resources to fulfill 40% of its teaching needs. By contrast, full-time academic staff will continue to receive the same salary in the short run, if it is not against the institution's policies to allocate some of the teaching needs traditionally fulfilled with part-time teaching resources to full-time staff.

DISCUSSION AND CONCLUSION

ABC is capable of identifying costs associated with the various activities performed across the value chain, which facilitates performance monitoring and encourages efficient and effective use of resources. This paper capitalises on this very benefit of ABC in assessing a staffing and compensation issue that plagues South Korean public universities. More specifically, this paper applies ABC to evaluate costs of teaching resources when committed, full-time versus flexible, part-time teaching resources are used. Results suggest that when teaching costs are converted into hourly activity driver rate, part-timers are not paid approximately one third of their full-time counterparts' pay as claimed. Instead, part-timers are paid more than one half of a typical full professor's hourly pay rate for teaching. Further, part-timers have fewer duties and responsibilities associated with teaching compared with their full-time counterparts. In short, results of this study provide little support to the claim that part-timers are underpaid and exploited.

While full-time academic staff are compensated with pay rates that vary depending on their qualifications, prior experiences and track records, part-timers are compensated at a constant pay rate regardless of their qualifications, prior experiences and track records. Being compensated at a constant pay rate without taking into consideration the varying degrees of expertise and contributions across individuals can be a source of

dissatisfaction and distress resulting in the feeling of being exploited. Future research can consider exploring the feasibility of having varying pay rates for part-timers to reflect differences in expertise and contributions especially when the participation of practitioners in academic teaching is becoming increasingly common to ensure alignment of education with practice (Clinebell & Clinebell, 2008).

While evaluating pay rate for teaching, use of ABC also reveals other avenues for improvement. For instance, the weight assigned to the three components of performance, i.e. 6:3:1 for teaching, research and other contributions, respectively, appear to encourage a focus on teaching among full-time academic staff. Recent developments suggest that making academic institutions and university degrees relevant to practice and the world beyond academia requires more active involvement in non-teaching related activities (e.g. see Clinebell & Clinebell, 2008; Pfeffer & Fong, 2002; Starkey & Madan, 2000). Further, research typically involves long working hours; it is a common practice for researchers to work after office hours and over weekends (Campos-Arceiz *et al.*, 2013). A performance evaluation system that assigns less than one third of the weight to research may not be sufficient to encourage investment of time and other resources into development of research expertise pertinent for scientific breakthroughs and innovations. Further, while street protests and suicides attributable to poor

compensation among part-timers have received press coverage (e.g. Park, 2010), full-timers have been found to be leaving academia for greener pastures (e.g. Kim, 2012; Rivkees & Genel, 2007; White *et al.*, 2013), which provides a preliminary indication of how satisfied full-timers are with their compensation packages. Future research can consider exploring whether the performance evaluation system and compensation packages for full-time academic staff are appropriate and well-aligned.

This paper presents the ABC approach in evaluating the staffing and compensation issue that South Korean public universities grapple with. Findings of this study have to be interpreted with caution in light of two limitations. First, instead of assigning costs of committed, full-time resources based on actual consumption of resources, this study assigns the costs based on expected consumption of resources as per the weight assigned to the three components of performance, i.e. teaching, research and other contributions. Nevertheless, findings of this study, which shed light on the cause-and-effect relationships between teaching activities and costs of full-time versus part-time resources consumed help policy makers in South Korea to explain their continued inaction on the compensation issue (Park, 2010). Second, this study, which applies a structured ABC approach, does not accommodate for less structured aspects of the staffing and compensation issue, such as differences in quality of teaching between full-time and part-time staff as

well as social and emotional well-being of staff. Further, unlike private institutions, public universities have social and political obligations in addition to the conventional economic goal of maximising profit, which can be a reason for public universities' incompetence in terms of compensation packages offered (e.g. Lau, 2013). Future research can consider bringing together the various perspectives in evaluating the staffing and compensation issue while taking into consideration the institution's social, political and economic goals for a more complete picture and comprehensive solutions.

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