Information Needs in Higher Education Institutions: Stock Valuation or Decision-Making?

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Abstract
Numerous higher education institutions apply a full costing system in their accounting model due to the imposition of formal agents (governments/funding institutions), or by suggestion of informal agents (associations). This paper analyzes whether the rationale applied by these agents to justify the use of the full costing rather than the direct/variable system is consistent with the theoretical bases underlying both costing systems. Methodologically, we review the mainstream literature that explores the links between the management accounting model and the use of its informative outcomes for the decision-making in higher education institutions. We conclude that there exists a gap between the theory-based statements and the information needs of these institutions. Remarkably, the full costing system falls short of adequateness for these institutions, which need information for their managerial decision-making process rather than for other industries’ decisions such as stock valuation. Thus, this paper contributes to a critical view on the use of full costing systems and calls for redirecting current practices towards other more effective partial costing systems. Our findings have implications for academic, managers and policymakers interested in the implementation and improvement of managerial accounting in public higher education institutions.

Keywords Full costing system · Direct costing system · Public sector · Higher education institutions · Public management

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Introduction

Academics and practitioners have centered the full costing vs. direct costing debate on issues like stock valuation or arbitrariness of cost allocation for many decades (Brummet, 1955; Drury, 2018; Hepworth, 1954; Horngren et al., 2002; Neilsen, 1954). This debate is yet to be finished (Brusca et al., 2019; Hutaibat and Alhatabat, 2020). In what academics and practitioners agree is on the idea that one costing system is insufficient, i.e., “no single system can adequately answer the demands made by the diverse functions of cost systems” (Kaplan, 1988, 11). Organizations require different informative structures to respond effectively to the information needs of addressers. In the field of management accounting, this means that no best and only way exists to simultaneously value products or services, make decisions, monitor processes, or plan and control activities. In other words, focusing solely on one system does not suffice.

Some governments (e.g., in Europe) and other influential agents are promoting the full costing system as the best method for managing costs and performance in higher education institutions (HEIs). This is not a new phenomenon. Since the end of the last century, accounting in the public sector has been mainly articulated around the full costing system. Different organizations and professional-lobby groups, such as the European University Association (EUA), also support this accounting model, even when this favorable recommendation contradicts their declared principles, i.e., their manifested general feeling that this is not always the best costing system for the public sector scenario (European University Association, 2008). Over the last decade these agents have been trying to convince HEIs to implement the full costing system (European University Association, 2008, 2015a, 2015b). They have been pressing HEIs and their funders to accept it instead of following the academic recommendation to explore information needs and choose the most adequate system to satisfy them.

Some critic voices, like Schmidt and Günther’s (2016, 26–27), report the lack of compatibility between the academic profession and managerialism, and demand research on the reexamination of control mechanisms in HEIs, “to find a balance between the increasing competition for resources, the need to increase efficiency and effectiveness and the academics’ pursuit of knowledge and learning for the public good.”

This paper responds to this call by reviewing the current imposition of the full costing system through the lens of full and direct/variable costing principles. Thus, the main objective of this paper is to study whether the former accounting model adequately suits the information needs of HEIs or if academics and practitioners are right in denying this assessment. To this end, we first explore the information needs of HEIs and then assess the appropriateness of each system (full costing and direct costing).

In doing this, we contribute to the management literature in HEIs by providing a better understanding of the relationship between the accounting model and HEI information needs. Our paper falls in line with van Helden and Northcott (2010, 214) when affirming that
A strong research-practice nexus offers important benefits to researchers, since the legitimation of their academic pursuits is enhanced by addressing relevant questions that contribute to the solution of practical problems and/or serve the interests of research stakeholders such as governments, policy-makers, accounting practitioners and business managers.

The paper is organized as follows. We first focus on the HEI information needs that costing systems must fulfill. Next, we review the core concepts of full and direct/variable costing systems, their origin and evolution, and the informative objectives they accomplish. This analysis allows for identifying the pros and cons of each costing system in HEIs to determine the adequacy of the full costing system. The final section of this paper presents the discussion and conclusions.

HEI Information Needs

Governments financially support public HEIs because they generate education, research and other services that foster the development of society. Public institutions offer their services, regardless of their profitability. Private centers, as they are for-profit organizations, can achieve their aim by offering similar services as long as they are profitable. Even more so, they may look for greater profitability by establishing a price that could be unaffordable to part of the society.

European public institutions are tax-financed. The amount of the public funds ranges from 40% in UK to over 95% in Iceland (European University Association, 2015a). On average, 72.8% of HEI funds come from public grants (European University Association, 2011). Thus, only a small part comes from private sources (e.g., student enrolment fees) or from their own financial revenues. Notably, after New Public Management (NPM) reforms started (Broadbent and Guthrie, 1992, 2008; Hood, 1991, 1995; Jackson and Lapsley, 2003), tax-payers expected value for money, i.e., an efficient use of financial resources for public ends. At the same time, society expected high quality research and teaching activities from these institutions. The aim was to (economically) benefit society by making an efficient use of public funds. In a post NPM era, each country implements reforms at its own pace with different degrees of success, including accounting achievements (Lapsley, 2009). All HEIs share the need for managerial information to guarantee an efficient and effective control of the institutions’ operational processes. In fact, Hood (1995, 93) coined the term “accountingization,” to refer to “the introduction of ever-more explicit cost categorization into areas where costs were previously aggregated, pooled or undefined.” Management accounting has therefore become a core strategic tool for public reforms.

Although public funding for teaching and research in European public HEIs has long been a controversial issue, the recent world economic and financial crisis of 2008 has made it ever more so. In addition to the tendency to reduce funds, European HEIs have faced increasing pressure to produce more with a significantly increasing number of students since the final quarter of the last century. This increased teaching production with decreased public funding has put a greater burden on achieving
more effectiveness and efficiency in the use of resources. It has also triggered a pro-active attitude in HEIs in their search for alternative sources of funding (European University Association, 2011, 2015a).

In this setting, HEIs require information for decision-making, control and performance evaluation among other matters. One of the strongest academic arguments for defending the superiority of the full-costing system lies on advantages for inventory valuation. However, the classical inventory valuation need is an irrelevant purpose for HEIs given their nature as service organizations without raw materials or stocks of final products. Even so, these organizations still require information to determine the costs of education, research and performed services. Remarkably, labor costs represent a substantial part of total costs, both direct and indirect, totaling around 70% of the global amount in HEIs of European and Organization for Economic Co-operation and Development countries (OECD, 2018). Hence, an indirect labor cost allocation free from arbitrariness should be a priority for all HEIs opting for a full costing system. Just like in other organizations, other non-labor overheads have become more and more significant quantitatively and qualitatively. This is partly due to the tremendous evolution in hardware, software and personnel linked to information technologies as well as the noteworthy improvement in campus infrastructures (European University Association, 2015a).

In summary, an adequate management costing system must consider two issues: the cost content (what?) and the information needs (what for?). The current HEI cost structure presents a significant weight in personnel cost as well as in the depreciation and amortization of tangible and intangible assets. These institutions need information on these issues for managerial purposes, i.e., information for decision-making and control. Therefore, the choice of a management accounting model must consider these issues.

The Choice of a Management Accounting System

Handbooks in financial and management accounting usually agree that information systems in all types of organizations are grounded on data. Consequently, organizations are to choose an accounting information model that fits their informative needs. Moreover, an adequate accounting information model must offer the required data to efficiently manage organizations (Brusca et al., 2019; Kostić et al., 2019).

It is generally accepted that management accounting models must provide data fulfilling some fundamental characteristics in order to be useful. Prior research on information systems identifies these characteristics as availability/accessibility, accuracy, reliability or objectivity, relevance/appropriateness, completeness, level of detail/conciseness, presentation, timing, value of information, and cost of information (Bovee et al., 2009; Choe, 2017; León et al., 2008). Accounting experts complete this view by adding verifiability. In fact, the International Accounting Standards Board (IASB, 2018 chapter 2, 2.4) indicates that “information is useful when it is relevant and represents faithfully what it purports to represent. The usefulness of financial information is enhanced if it is comparable, verifiable, timely and understandable.” Ergo, the fundamental qualitative characteristics for financial information are relevance and faithful
representation, which can be enhanced with comparability, verifiability, timeliness, and understandability.

In the case of managerial information, we agree with Blocher et al. (2005) when saying that usefulness and timeliness prevails in this type of information. Thus, the choice of a management accounting model is guided by the desire to produce appropriate information allowing organizations, for instance HEIs, to adequately manage their resources (International Federation of Accountants [IFAC], 2009). Among other features, accounting must be able to capture and respond to the business model needs and the organizational processes. These are questions that managers must consider when choosing among different costing systems. As accounting experts recommend, “Cost models should be designed and maintained to reflect the cause-and-effect interrelationships and the behavioral dynamics of the way the organization functions.” (International Federation of Accountants, 2009, 10).

This emphasis on the “fit” between management accounting models and the business models it captures is a core issue of debate in accounting. In 2014, the Institute of Management Accountants (IMA) (Institute of Management Accountants, 2014, 3) stated that,

There is substantial confusion about what is the best or most appropriate approach for organizations to measure and report costs for managerial decisions. One would think that now in the 21st Century this situation would be resolved, but debates continue, even among management accountants, about which approach to use.

The IMA concludes that no unique and best system exists for cost calculation. Quite the contrary, it encourages the utilization of different systems. The IMA establishes a clear distinction between methods oriented toward obtaining information for decision-making (e.g., variable costing) and those focusing on stock valuation and financial accounting (e.g., full costing). The choice of a full costing system cannot be justified as the most adequate method for decision making given the absence of a clear and quantifiable relationship between overheads and cost objects (Table 1). Financial accounting demands full costing for financial statements because special attention is paid to stock valuation. For instance, the International Accounting Standards Board (IASB) assesses that: “The cost of inventories includes all costs of purchase, costs of conversion (direct labour and production overhead) and other costs incurred in bringing the inventories to their present location and condition” (IAS 2.10). Thus, the full costing system concept applied to private companies is primarily framed as being useful for value inventories, and it only comprises production or industrial costs. It thereby sets aside all other costs like administrative, commercial, or financial. According to the

| Purpose                                    | Costing system             |
|--------------------------------------------|-----------------------------|
| Information for decision-making            | Variable costing            |
| Stock valuation and financial accounting   | Full costing                |

Table 1 Costing system for a purpose
International Public Sector Accounting Sector Board (IPSASB) (IFAC, 2018a, 2018b, IPSAS 12), the rhetoric of professional associations with regard to the full costing system concept is similar for the public sector. Their discourses present no noticeable difference.

Full costing system is a cost calculation method that considers all direct and indirect production costs when valuating stocks or services. This system sums up direct and all variable and fixed indirect costs (e.g., Horngren et al., 2002). In academia and among practitioners, the full costing system is defined as having different components regardless of whether it includes commercial, administrative, research and development and other non-industrial costs in function of the product costing purpose (for stock valuation within financial statements; for reimbursement under government contracts; or for pricing and product emphasis) as Horngren et al. (2002) assesses.

Numerical differences emerge when partial costs are calculated under the lenses of different partial costing systems (Pong and Mitchell, 2006). Costs are classified as either direct or indirect costs attending to their traceability (European University Association, 2008; Lutilsky and Dragija, 2012); or as variable and fixed costs based on their behavior. The first classification results in direct costing systems (Geri and Ronen, 2005; Marple Raymond, 1955), while the second results in variable costing systems (Horngren et al., 2002). A direct costing system and a variable costing system are different, but they are frequently used indistinctly. Direct costing only captures costs undoubtedly assignable to the cost object. This is not only a mistake of practitioners but also some academics frame direct costing as being equivalent to variable costing. For instance, in the glossary of Horngren et al.'s Management and Cost Accounting we can read: “Variable costing: stock costing method in which all variable manufacturing costs are included as inventoriable costs. All fixed manufacturing costs are excluded from inventoriable costs; they are costs of the period in which they are incurred. Also called direct costing.” (Horngren et al., 2002, 904). Noticeably, this analysis shares with the rhetoric of the full costing system its focus on industrial or production costs.

Overheads and their allocation centered the debate. The direct costing systems assumes that indirect overheads have no clear and quantifiable relationship with, or are not attributable to, cost objects, while the variable costing system assumes this statement for fixed overheads. Consequently, these overheads must be assigned using somewhat arbitrary calculations. Rhetorically, “A major argument for direct costing grows out of this objection to total costing in that it avoids questionable and arbitrary allocations of manufacturing expense to products, when in fact it bears no immediate relationship to the production achieved.” (Neilsen, 1954, 90). Therefore, the overhead allocation problem remains as one of the main issues in choosing between partial or full costing system. For example, Kaplan and Thompson (1971) seek to find more accurate and scientific ways to allocate overheads.

The increasing importance of overheads in combination with the distance between theory and practice (Johnson and Kaplan, 1987), has left room for rhetoric supporting new management accounting model proposals like the Activity Based Costing (ABC). Even so, the ABC is usually a full costing system not only because its users tend to consider that products and services should absorb all production
costs but also because the ABC is strongly dependent on the goodness of the drivers selected, and their actual relationship to costs. As Horngren et al. (2002) warned, ABC does not guarantee more accurate costs per se.

Since the beginning of last century many authors have noted the need for using different costing systems depending on the purpose of the information. From Clark (1923) to Kaplan (1988) and even later, nearly all management accounting textbooks (Blocher et al., 2005; Horngren et al., 2002) have already established this knowledge. Furthermore, seminal literature from the beginning of last century argues that full costing system, with its arbitrariness in allocating indirect costs, specially fixed costs, may not be the most appropriate method for obtaining information for decision making despite its likely suitability for valuating inventories or supporting the definition of prices (Mason, 1926). As above mentioned, this debate is still open, not only in the public education sector but also in other public services such as the healthcare sector (Bertoni et al., 2017; Regonha et al., 2016; Tarricone and Torbica, 2012).

Among other practitioners, Johnson and Kaplan (1987) and Brierley et al. (2001a, 2001b) find that private companies all over Europe are not to “bear the cost” and additional time for maintaining more than one system. Although full costing system is the most extensively chosen method given that calculating costs for the purpose of valuing inventories is compulsory as part of corporate financial statements, these authors report that some companies somehow develop other information systems for decision-making at different and parallel hierarchy levels. Most frequently, their managers use spreadsheets and expedited alternative methods based more on expertise than on accrual data. This duplicity causes sometimes reconciliation problems with automatic information systems (e.g., ERPs) that are parametrized according to a full costing system.

The matter is whether full costing system responds to the required needs. Academics and professionals provide different solutions, like the use of more than one system (Brierley et al., 2001b), which poses complexity problems, higher cost and more time consumption. Therefore, many private companies opt to spending resources on an only system, full costing, because regulation allows it to obtain the information to be transposed to financial accounting even despite the fact that it is not the best option for all needs. International accounting setters also prescribe the use of full costing system for the public sector (IPSAS 12–Inventories). What is more, some countries, e.g., Portugal, have already adopted this rule in national legislation (Sistema de Normalização Contabilística Para as Administrações Públicas (SNC-AP), 2015, sec. NCP 10-Inventories).

Costing in Public Higher Education Institutions

As stated, academics and practitioners agree on the objectives of management accounting for private organizations. A management accounting model must satisfy three goals: stock valuation (a financial accounting goal), decision-making, and planning, control and performance appraisal. According to their rationale, different purposes require different methods. We defend that this conclusion may be extended
to organizations in the public sector in general and to public HEIs in particular. Full costing system can give useful information for many purposes, but surely not for internal decision-making or an accurate evaluation of the economic impact of public resources received and managed by HEIs. Economic security, understood as reducing costs and increasing efficiency, is a key rationale when designing organizational information systems (Breus et al., 2017) that should offer the necessary information to this end.

The full costing system continues to prevail in both the private and public sector and has an underlying aim: to justify the financial support received (Estermann and Claeys-Kulik, 2013). Its use in the public sector is either a recommendation or a mandatory system depending on the country (Gideon, 2017). Its prevalence is a fact (Bertoni et al., 2017), but institutional accounting standard setters (private and public) and national legislations (Austria, Finland, Ireland, Norway, Sweden, Portugal, Spain, UK, etc.) understand it quite differently. For instance, Portuguese legislation presents different rules within the very same law (SNC-AP) like NCP 10—Inventories, which only considers production costs, while NCP 27—Management Accounting considers all costs. In the UK, full Economic Costing under the Transparent Approach to Costing for HEI considers all costs, including financial ones (JM Consulting Ltd, 2005). Both examples, Portugal (DL 192/2015 de 11/09 – SNC-AP 2015) and the UK (Higher Education Funding Council for England, 2017), are inspired by the ABC, which includes all costs given that they are previously assigned to activities and subsequently allocated to products or services through cost drivers.

As aforementioned, labor represents the most important cost in HEIs (70%, on average, in OECD and the EU). It includes indirect labor costs that have steadily grown given the rise in qualified non-teaching staff. The reality is vastly different to the mainly administrative and unqualified personnel of the past. On the other hand, stocks and inventories represent a minor component of the total costs. Therefore, the full costing system, mainly useful for stock and inventory valuation (not for decision-making) is surely not the most adequate for HEIs. Public HEIs are not-for-profit organizations, so we do not anticipate the validity of a justification such as “the propensity of these alternative accounting methods to generate different profit that has fuelled the long and sometimes bitter debate about their relative merits” (Pong and Mitchell, 2006, 134). This point reinforces our rationale. Public HEIs do not have to deal with taxes and stock valuation is irrelevant. So, the importance of full costing does not suffice to justify its implementation. However, it may be used as a means to justify higher funding from external entities because it will always compute for a higher value of any cost object.

This technical reasoning focuses on the reliability of information to make accurate decisions. However, other reasons of a social or political nature could be decisive for public authorities choosing the full costing system. The allocation of indirect costs among different services may lead to intentional cross-subsidies to make university services, which would otherwise disappear under pure economic analysis, more sustainable. Although HEIs need not generate large profits, long gone are the days when governments tolerated large deficits and unbalanced accounts. Social and political debates focus on the proper use of public resources while recognizing that social needs must inevitably be addressed. Apart from the current recognition given
to the medical field, particularly after the Covid-19 pandemic, citizens seem to be unaware that higher education and research are essential needs for society (Belcher et al., 2022). As citizens demand that the taxes they pay be put to efficient use, a direct costing system could point directly to degrees/areas of knowledge with very little demand but very expensive laboratories, or highly deficient services that consume resources from large infrastructures, e.g., the ones devoted to basic research that are essential for applied research but have no economic return.

Discussion and Conclusions

The debate full costing vs. partial costing began many decades ago, when costing systems mainly focused on inventory valuation. Until the end of the last century, in the 1980s and 1990s, the rationality of “efficiency” supported the use of a sole costing system to calculate production costs. This is understandable given that the technology available at that time would not allow for obtaining management accounting information for several purposes. However, as of the 1990s and especially as of the current millennium, technological development in hardware and software have made the simultaneous calculation of costs according to different methodologies available to organizations, especially those of large and medium size. Rather than taking advantage of technological tools, governments and other public and private funding institutions insist on imposing the use of full costing system in HEIs for all purposes (funding justification, decision-making, performance evaluation, inventory valuation, etc.). As we have seen, the fact that different needs require different costing systems makes more sense nowadays. So why do governments continue to insist that full costing system is the “best and only way” for HEIs management accounting model? This paper contributes to shed light on the scenario and understand the backstage of this matter. We identify the gap between what academia has taught us through previous research on the usefulness of full and direct/variable costing systems, and what HEIs are supposed to do with the informative outcomes of a full costing system.

Industrial companies clearly dominate in the world of management accounting rhetoric. This is unsurprising because it was there where management accounting was born and developed. At the beginning of the last century, the usual industrial cost structure consisted of direct materials, direct labor and overheads. Materials and labor represented the highest amount of the total cost. Nowadays, technology (among other external elements) has triggered a significant shift toward the major weight of overhead costs. Despite criticism on the use of the full costing system even for valuation purposes and its arbitrary allocation (Pong and Mitchell, 2006), international rule setters like IASB and IPSASB insist on imposing it for inventory valuation in financial accounting standards. In the public sector, particularly in HEIs, labor still represents the most significant part of total costs. Although overheads have increasingly come in at second place over the last decades, it seems that full cost is used as a means to justify larger funds from external entities, i.e., for funding purposes because it will always compute a higher value for any cost object.
This is a twisted rationale as total costs in HEIs may be perfectly justified with budgeted financial statements.

Another rationale to be considered when addressing the previous question is the significant difference between privately owned and public HEIs, in terms of their distinct final goals, profit (capital investment recovery), and continuity/growth (assure funding). The former group of organizations declares that their main economic concern is to achieve enough leeway to cover both cost and capital remuneration. The latter assures the continuity of funding (economic security), which allows for covering all costs. Based on this main concern of public HEIs, sectorial organizations like EUA defend and promote the full costing system. Securing the maintenance or growth of institutional autonomy is considered an essential endeavor.

Yet in spite of all these efforts, only a limited number of European governments and funders (public and private) have accepted the full costing system as a valid way to assure the reimbursement of full costs, principally on research projects (European University Association, 2018). Even the European Union, one of the biggest European research funders, continues to reject it in spite of some openness to the full costing system during the Framework Program 7 (FP7). Many reasons, ranging from a rather diverse European HEI scenario at national levels (e.g., Germany and the Netherlands) to the changing political and strategic wills, have contributed to this reality.

Surely much remains to be done to improve efficiency, effectivity and economy in European public HEIs. At any rate, the use of the full costing system to obtain information for decision-making cannot achieve these goals. A final consideration is related to the convenience of direct costing or variable costing for HEISs. Personnel in European countries, including teachers, receive a fixed salary, which can be contemplated fixed cost related in a direct way to a grade, a course, etc., while in America, these labor costs are mainly variable. This suggest us that the direct costing system may be more advisable in the European setting while the variable costing system captures better the American HEI one.

The results of our analysis may be of interest for managers of HEIs (rectors, presidents, deans, administrators, etc.), who find it hard to in conciliate their information needs with the full costing system. On the other hand, it may also be of interest to funders (governments and others) attempting to make the best use of their resources through a controversial, to say the least, imposed system. Finally, these trade-offs may benefit the stakeholders involved in this activity (students, staff, suppliers, etc.) as well as society, which delegates in their governments the choice of a costing system allowing HEIs to use their limited financial resources more efficiently and effectively.

This paper is a first approach to the costing system and its informative outcomes in HEIs. Future research could delve deeper into the use of these data for the necessary decision-making process when managing HEIs. Case studies on specific institutions that have been sensitive to these issues may be an interesting avenue. It would also be of interest to identify the use and usefulness of the information provided by the cost accounting model for those HEIs that have implemented it or, by contrary, the reasons behind not having implemented it yet.
Declarations

Conflict of interest On behalf of all the authors, the corresponding author states that there is no conflict of interest.

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