A New Formulation of University Loss by Taking into Account Hidden Loss

Une nouvelle formulation de la déperdition universitaire en tenant compte des coûts cachés

JAFARI Bouchra
Doctor Researcher
Faculty of Legal, Economic and Social Sciences, Souissi-Rabat, Morocco
Mohammed V University in Rabat
Laboratory of Economic Analysis and Modeling *(LEAM)*
br-jafari1990@hotmail.com

YOUSFI Abdellah
Teacher-Researcher
Faculty of Legal, Economic and Social Sciences, Souissi-Rabat, Morocco
Mohammed V University in Rabat
Laboratory of Economic Analysis and Modeling *(LEAM)*
a.yousfi@um5r.ac.ma

Abstract:

Being alone, dismayingly overwhelmed by a deficit spending situation is the case of Moroccan universities that have marked the seal of budgetary mismanagement suffering from financial handicaps in chain to the point of becoming impassable. There is no doubt that university loss (also called Input-output ratio) is one of the main reasons why financial resources are insufficient to cover all university needs. However, if there is a criticism to be made, it would be that the university loss as an indicator is miscalculated, since it unintentionally leaves out of its formula the hidden costs due to the absenteeism of teacher-researchers and students, who are considered as an imperceptible financial abyss. Therefore, revisiting the formula of university loss is a challenge because it is a problem that has rarely been addressed in depth, and we will attempt to provide a detailed analysis of this problem by linking university loss to the hidden costs related to the absenteeism of teacher-researchers and students. To put it simply, the objective of this article is to correct the indicator of university loss, so that the university financial system, which is hit by a double penalty of both direct and indirect costs, can stay afloat.

Keywords : Academic loss ; absenteeism ; hidden performance costs; teacher-researchers; students.

Résumé :

Être esseulées, consternamment dépassées par une situation des dépenses déficitaires est le cas des universités marocaines qui ont marqué du sceau de la mauvaise gestion budgétaire subissant des handicaps financiers en chaine au point d'en devenir infranchissables. Nul doute que la déperdition universitaire est l'une des principales causes qui font que les ressources financières ne suffisent pas pour couvrir la totalité des besoins universitaires. Cependant, s'il y avait une critique à faire, ce serait que la déperdition universitaire en tant qu'indicateur est mal calculée, puisqu'elle met involontairement de côté l'introduction dans sa formule des coûts cachés dus à l'absentéisme des enseignants chercheurs et des étudiants qui se présentent comme un gouffre financier imperceptible. De ce fait, revisiter la formule de la déperdition universitaire relève de la gageure car il s'agit d'une problématique rarement abordée en profondeur à laquelle on va tenter d'apporter une analyse fine, tout en faisant la jonction entre la déperdition universitaire et les coûts cachés relatifs à l'absentéisme des enseignants-chercheurs et des étudiants. Pour faire simple, l'objectif de cet article est de corriger l'indicateur de la déperdition universitaire, afin que le système financier universitaire frappé d'une double peine à la fois des coûts directs et indirects puisse rester à flot.

Mots-clés : Déperdition universitaire, Absentéisme, Coût de performance caché, Enseignant-chercheur, Etudiant.

Introduction

University decision-makers are completely confused, they are no longer know where to turn following the accumulation of several phenomena, the loss of which relegates to the main rank. It is all the more important to clarify that absenteeism, abandonment and repetition are different facets of academic loss (Kantabaze, 2010 ; Demir and Karabeyoglu, 2015 ; Gurbuz and *al.*, 2017).

In addition, which is certain that with all these obstacles, universities are on a tight rope, they can hardly hold the reins since they do not know how to best manage their efforts (Ayad and al., 2020). Therefore, to block academic loss and its derivatives as well as its negative impact on financial resources, we must start by knowing why things are not going as planned despite the efforts made, that is, to try to understand what the visible costs on the university accounting balance sheet are able to justify in themselves this drifting financial situation or there are many other hidden costs that do not appear in the information system of the university and which on the other hand make the universities endure an imperceptible financial ordeal.

However, according to departmental data, academic loss has now become a permanent danger since 40% [1]of undergraduate students do not graduate. As a result, this percentage could not be swept away by a simple backhand, but if there is one thing that can be done, it is to analyze this phenomenon from all sides and especially from a financial point of view to prevent Moroccan universities from spending a significant additional amount of money each time.

Furthermore, we must not forget to point out that the absenteeism of students and teacher-researchers is excluded in the formula for university loss while it is part of it, as a result of which, we could consider that the loss as an indicator is poorly estimated. In this perspective, we used a method of financial calculation that someone had never used before in the academic world, it is a question of drawing inspiration from the work of Henri Savall on the hidden performance costs (Savall and Zardet, 1995) which are teeming with innovative ideas to merge university loss and the hidden costs due to absenteeism of students and teacher-researchers into a single indicator.

The use of the hidden performance cost method, which confirms its place in the industrial environment, has allowed us to change the biased view of academic loss while bringing more

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[1] Cited by: Annual Report on the Human Rights Situation in Morocco 2019, p. 271.

credibility to the method of its financial calculation. We must admit that at the start we looked for a method that would be formidably effective to correct the indicator of university loss, but it is only the theory of hidden performance costs that found the means, therefore. it deserves all the praising words that are made to it.

In conclusion, in this introductory section, we have tried to explain why we have set our sights on the hidden performance cost method, because as mentioned above, all the ingredients were there to make it a powerfully unheard-of accounting method. Therefore, to bring a renewal to the formula for university loss, we will rely on this method while reusing it differently at the university level. To do this, we will first focus on the conceptual and technical clarification of academic loss. Next, we set out to define the theory of hidden performance costs in general and hidden university costs in particular. Finally, the last part is devoted to correcting the formula for university loss while taking into account the hidden costs due to absenteeism of students and teacher-researchers.

Our aim is to try to answer in more detail the following question: how to reformulate the academic loss while taking into account the hidden costs?

1. Conceptual clarification

1.1. Academic Loss (input-output ratio)

To be able to become clearly aware of the dramatic consequences of the phenomenon of loss at the university level, there is no doubt that we first need to clarify this notion, in order to understand all its facets and all the difficulties. The word loss is derived from the Latin verb deperdere which means *"to lose gradually"*, at the school level the loss of enrollment is defined as: *"premature exit of part of the school population engaged in a cycle or in a program of studies"*[2]

To obtain a concentrate of relevant opinions on university loss, we sought the views of different authors such as Alain Drouard (1977) who sees that university loss can be defined in two ways. Or it corresponds in the narrow sense to the abandonment of higher education without obtaining a diploma. Or, in the broad sense, it refers to obtaining a university degree over a longer period than the normal duration and between the two, there is another situation relating

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[2] Cited by : A. Olivier LABÉ (2010). « Le redoublement, la réussite scolaire et l'objectif de la Scolarisation Primaire Universelle (SPU) d'ici à 2015 dans le cadre de l'Éducation Pour Tous (EPT) : cas du Sénégal à partir des données longitudinales du PASEC », University of Montreal, p. 5.

to those who abandon their university studies temporarily to re-enrol again while obtaining a diploma at the end.

The Organisation for Economic Co-operation and Development (OECD) has formed its own opinion on academic loss, which has certainly attracted our curiosity, for it the fact that a student does not complete a programme is not considered a failure, It may still delay the completion of their studies to work for a period of time, she says in this regard that: *« Dropout rates can, of course, be a sign of problems in education systems, but it can be misleading to regard a student's decision not to finish a programme as a failure. As noted above, even limited exposure to tertiary-level education can improve job-market prospects in some countries, while students may also postpone completing their studies to work for a time. In addition, students may also be successfully reoriented from one branch of education to another »[3].*

In addition, Liga Paura and Irina Arhipova (2014) point to the factors that are at the origin of university loss, as such, they cite the following factors: the relatively low levels of previous qualifications, the subjects studied at the university, individual and institutional characteristics. Furthermore, Paola Perchinunno, Massimo Bilancia and Domenico Vitale (2019) find that one of the most significant indicators for assessing the quality of academic careers is the loss rate between the first and second year. They say in this regard that: *« Both literature on the subjects and the results that emerged from numerous specific investigations into the dropouts of the university system, showed the crucial importance of this junction between the first and the second year. Reasons for dropping out can be quite varied, ranging from incorrect and/or insufficient prospective student orientation, the willingness or need to find a job as quickly as possible, to a lack of awareness of not being able to cope with a particular course of study rather than another ».*

At the national level, university loss is spreading at the speed of light with both social and financial costs. According to the report of the Higher Council of Education, Training and Scientific Research (CSEFRS)[4] published in 2018 which is entitled: "Higher education in Morocco: Effectiveness, efficiency and challenges of the open access university system": *«The*

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[3] OECD (2009), "How many students drop out of tertiary education?", in Highlights from Education at a Glance 2008, OECD Publishing, Paris.

[4] See the following link for more information on (CSEFRS): https://www.eunec.eu/member/higher-council-education-training-and-research-morocco

basic license cycle generates significant losses which affect the quality of university training and entail a social and financial cost. The social cost manifests itself in the stigmatization of a public university, especially its open access system, which fails to retain students and provide them with quality education. As for the financial cost, it hinders an optimization of the resources to be invested in the quality of education». The same report confronts us with the reality of the level of student loss and absenteeism in the open access system making it a **"depreciated residual"** system.

All these explanations have served as a compass to be able to understand the infernal loop of which the university situation is found following the loss which brings its share of various problems (absenteeism, repetition, abandonment).

Moreover, to answer the question that arises around university loss and its relationship with absenteeism and to understand at the same time where we want to come to this problem which is not lacking in interest, there is a paragraph essential that we can overcome or throw away, since it allows us to take into account the link between effectiveness and loss. Therefore, our attention in what follows will be more focused on the analysis of this link in academic field.

In the science of education the effectiveness coefficient is defined as: *« the ideal (optimal) number of student years required (i.e., in the absence of repetition and dropout) to produce a number of graduates from a given cohort complete their schooling at a given cycle or level of education, expressed as a percentage of the effective number of student years devoted to the training of students »* (UNESCO, 2009).

For a given cohort, the effectiveness is described as follows:

$$Effectiveness = \frac{NYG}{NYTS}$$

With :

NYG : The ideal total number of years consumed by the graduates students of the cohort (if for example we have 3 years to obtain the diploma, then NYG is 3 multiplied by NG the number of graduates students of the cohort);

NYTS : The total number of years consumed by all students in the cohort;

The loss in this case is the inverse of the effectiveness:

$$Loss_{old} \ = \frac{1}{effectiveness} = \frac{NYTS}{NYG}$$

1.2. Hidden university cost

In 1974, Henri Savall was able, with the help of the theory of hidden performance costs, to propose a new method of accounting calculation which is unlike anything known. In fact, this professor emeritus at IAE Lyon, Jean Moulin University and his team from ISEOR (Institute of Socio-Economics of Enterprises and Organizations) have developed a theory of incredible virtuosity since she was interested in for the first time to the imperceptible behavioral aspect of the employees causing a huge financial mess. With this theory Henri Savall confirms his place among the 50 most influential living authors[5] in the management of organizations in the world (FNEGE, 2016). In addition, the originality of the hidden performance cost method is not only due to the fact that it brings a renewal in the estimation of costs in the industrial and entrepreneurial world, but also to the fact that it can be reused in other sectors such as the university sector which suffers from the phenomena of dropout, repetition and in particular absenteeism that cannot simply be swept away with the back of the hand following the danger that represents for the budgetary sustainability of universities (Pauli and Brimer, 1971).

It is moreover from this method of calculating hidden costs which are defined according to Savall and Zardet (1995) as: "the monetary translation of regulatory activities", that we are inspired to deal with the problem of loss due to absenteeism of teacher- researchers and students.

In addition, the revenues of Moroccan universities come mainly from state allocations which amount according to the presentation note of the draft finance law for the budget year 2021 to more than 71 billion dirhams broken down on the sector of: national education, vocational training, higher education and scientific research. However, the state tries very hard to spend large sums to promote the university system but it still remains plunged into the litany of sequences to the failures and various problems, causing the annual operating cost per student to deteriorate because of an additional operating cost generated mainly by loss (CSEFRS, 2018).

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[5] See the following link: http://www.iseor-consulting.com/pdf/flyer-resultat-enqueteFnege.pdf

Besides, absenteeism, this term deriving from the English word absentee with the suffix -ism, in reference to the absence of large landowners, particularly Irish, from their agricultural property, is at the origin of the financial spiral of universities. However, there are so few authors like Savall and the members of his ISEOR team, who are really interested in studying the impact of the hidden cost of absenteeism on the proper functioning of companies, the other authors have chosen to focus on the notional clarification of this phenomenon. In this regard, the definition given by Behrend (n.d., cited in Veil, 2012) describes absenteeism as ***"the habit of some workers to refrain from going to work without a valid reason"***. At the school and university level, absenteeism is defined as the absence from school or university with or without justified excuse (Stoll, 1990; Kearney, 2008).

Worse still, the School and University system does not only suffer from student absenteeism but also from teacher-researchers (Foldesy and Foster, 1989; Rogers and Vegas, 2009; Suryaman and Mulyono, 2019), which means twice as many imperceptible financial problems to bear and which will grow more and more if the decision makers do not take the great steps to put an end to these incorrect human attitudes. Therefore, we will be grateful to Henri Savall for developing a theory which is according to our point of view the best possible choice for calculating the full university cost by taking into account both the direct and indirect costs which have been shown to be more complementary in the managerial field, giving better than expected accounting results.

Basically, we will be helped in the following part by the laudable ideas of the theory of hidden performance costs that we will try to adapt to the university context to address our problem of loss due to the absenteeism based on two approaches: the first aims at the calculation of the loss over the number of years, while the second focuses on the calculation of the loss on the financial cost of each student.

2. The new formula for loss over the number of years (Approach 1)

2.1. Ratings

For a given cohort, we denote by:

NYG : The ideal total number of years consumed by the graduates of the cohort (if for example we have 3 years to obtain the diploma, then NYG is 3 multiplied by NG the number of graduates of the cohort studied. mention that in this example it is assumed that there is no absenteeism);

NYTS : The total number of years consumed by all students in the cohort;

N: Number of students in the cohort;

K: The number of days of absenteeism for all students in the cohort;

L: The number of days of absenteeism for teachers training the cohort, transformed into the number of days of absenteeism for students (Eq. 1);

D: The total number of graduates in the cohort;

For a year t of the cohort, it is assumed for the purposes of the simulation that we have the absenteeism table for teacher-researchers (Table1), where it is specified the number of students corresponding to each teacher-researcher for the two semesters: spring and autumn.

		Teach1	Teach2	….	Teach$M$
Number of students	Spring semester	n^t_{11}	n^t_{12}		n^t_{1M}
	Autumn semester	n^t_{21}	n^t_{22}		n^t_{2M}
Number of absenteeism in days without resit exam	Spring semester	a^t_{11}	a^t_{12}		a^t_{1M}
	Autumn semester	a^t_{21}	a^t_{22}		a^t_{2M}

The absence of all teacher-researchers is equivalent to an absence of:

$$L = \sum_t \sum_{i=1}^{M}(n^t_{1i} \times a^t_{1i} + n^t_{2i} \times a^t_{2i}) \text{ days of all students in a year } (1).$$

That is to say at the end we will have L+K days of absence for both students and teacher-researchers.

2.2. Redefining university loss by taking into account absenteeism:

After learning about the concept of absenteeism and its negative effects on the university system, it is time for absenteeism to be taken seriously as a phenomenon that is rapidly expanding and generating unbearable financial costs.

The definition of loss adopted by UNESCO only takes into account the loss due to the abandonment and repetition of students, but it also forgets to include the loss due to absenteeism (loss or hidden cost) of students and teacher-researchers.

To integrate this hidden loss, we propose to adapt the definition given by UNESCO (UNESCO, 2009), therefore, we redefine the new loss as follows:

The loss is the number of student-years devoted to the training of all students in the cohort more the number of absenteeism years of students and teachers, divided on the ideal (optimal) number of student-years required (i.e., in the absence of repetition, abandonment and absenteeism), to produce a number of graduates from a given cohort.

From this definition, the new formula of loss becomes:

$$Loss_{new} = \frac{1}{effectiveness} = \frac{NYTS + (K + L)/365}{NYG}$$

$$Loss_{new} = Loss_{old} + \frac{(K + L)/365}{NYG}$$

2.3. Hidden loss due to absenteeism:

The loss due to absenteeism is the total number of years of absenteeism of students and teacher-researchers during the entire duration of a cohort divided over the ideal (optimal) number of student years required (i.e. - say in the absence of repetition, dropout and absenteeism), so that a certain number of students belonging to a given cohort complete their degree.

According to this definition, the hidden loss due to absenteeism is given by the following formula:

$$Loss_{Hidden} = Loss_{new} - Loss_{old} = \frac{(K + L)/365}{NYG}$$

Example:

For a given cohort, we have the following data:

- D = 500 is the number of graduates for this cohort.

- N = 1000 is the number of students entering the cohort.

- The duration to obtain the diploma is 3 years, the duration of the cohort is 10 years

- NYTS = 3500 years.

- NYG = 500 * 3 = 1500 years

- K = 100,000 days of absenteeism for students during the duration of the cohort.

- L = 600,000 days of student absenteeism caused by the absence of teacher-researchers during the duration of the cohort.

$$Loss_{old} = \frac{NYTS}{NYG} = \frac{3500}{1500} = 2,33$$

$$Loss_{Hidden} = \frac{(K+L)/365}{NYG} = \frac{(100000+600000)/365}{1500} = 1,28$$

$$Loss_{new} = Loss_{old} + Loss_{Hidden} = 2,33 + 1,28 = 3,61$$

3. The hidden loss due to absenteeism on the student cost (Approach (2))

There have always been a few things that bothered us in the accounting calculation of university costs, in fact, what leaves the doubt is that the budget dedicated to the universities was not filiform but on the contrary it was acceptable, however it did not allow not to lead to the results that met the expectations raised. It is only until we read Henri Savall's articles that we knew exactly what was missing to make university accounting calculations more meaningful. This has led us to become aware of student and teaching behavior and more specifically of the phenomenon of absenteeism to which we have dedicated an article entitled : *« Controlling the hidden cost due to the absenteeism of teacher-researchers and students as a means of alleviating the university financial asphyxiation »* and during which we proposed a *« revision of the method of calculating the cost of a student by introducing the absenteeism factor for teacher-researchers and students. The introduction of this factor will make it possible to calculate a hidden cost that has never been taken into account when calculating the cost of a student »* (Jafari and al., 2020). Basically, this little reminder is to say that this new article is in line with our previous work on hidden costs in the university context,

In addition, by using the above data, the ideal cost of each student taking into account the absenteeism of University professors and students will be in the following form:

$$Cost.stud.abs = \frac{GB}{N - \dfrac{L+K}{365}} = \frac{Cost.stud.Ancient}{1 - \dfrac{L+K}{N \times 365}}$$

With :

- K: The number of days of absenteeism of N students during the whole year (365 days), so 0≤K≤N × 365.
- L: The number of days of absenteeism for M teachers-researchers throughout the year (365 days).
- BG: General budget allocated to universities.

Basically, the overall hidden cost due to absenteeism of university professors and students which is ignored in the calculation of the cost of a student in a year, is given by:

$$Cost_{Hidden} = \frac{Cost.Stud.Ancient}{1 - \dfrac{L+K}{N \times 365}} - Cost.Stud.Ancient =$$

$$Cost.Stud.Ancient \times \left(\frac{L+K}{N \times 365 - L - K}\right)$$

The loss due to absenteeism on the student cost is given by:

$$Loss = \frac{Cost_{Hidden}}{Cost.Stud.Ancient} = \frac{L+K}{N \times 365 - L - K}$$

So, for each student, we have a loss of $\left(\frac{L+K}{N \times 365 - L - K} \times 100\right)$% of the student cost.

Conclusion

In this article, we wanted to show how the fact of not bending to the hours of work and study can imperceptibly have an indirect impact in the drying up of university financial resources. In fact, absenteeism is a concept that refers to a phenomenon beyond accounting calculation since universities are unwittingly forced to pay extra money without knowing why.

Known mainly by his theory of hidden performance costs with which a new method of calculating the costs of absenteeism has emerged, Henri Savall has changed the view on costs by proving that most leaders have difficulty in perceiving attitudes of human beings surrounding them properly.

Based on this theory, our main objective was to find a way to curb unnecessary spending due to hidden loss, to do this, we have dealt with this problem through two approaches which aim respectively at calculating the loss on the number of years as well as on the financial cost of each student.

Basically, for the purposes of the simulation, we have presented examples that illustrate the extent of the financial damage caused by setting aside the hidden costs due to absenteeism of teacher-researchers and students (Obeng-Denteh and *al.,* 2011). In fact, it is sure that the costs are part of the university budget are legion (Buchanan, 1991; Mongomery and Powell, 2006 ; Ducrocq and Gervais, 2013 ; Kurniawan and *al.,* 2016) but it is only with the consideration of the indirect costs when the university expenses can perform.

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