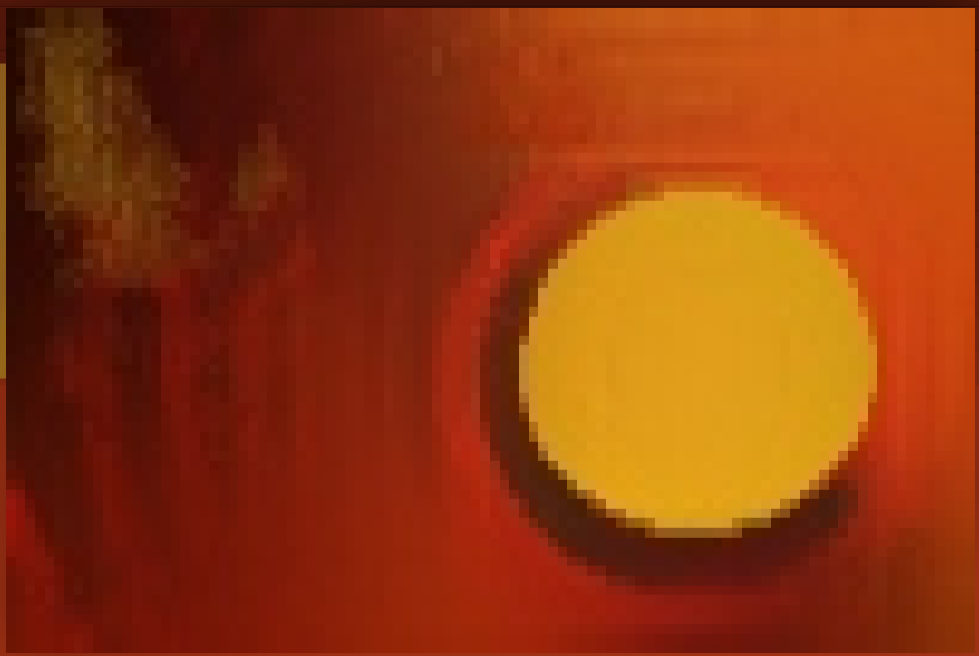
ESTUDOS I



FACULDADE de ECONOMIA da UNIVERSIDADE do ALGARVE

ESTUDOS I

Cidadania, Instituição e Património

Economia e Desenvolvimento Regional

Finanças e Contabilidade

Gestão e Apoio à Decisão

Modelos Aplicados à Economia e à Gestão

A Faculdade de Economia da Universidade do Algarve

Faculdade de Economia da Universidade do Algarve

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The Bologna challenge for Portugal: Credit recognition

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Abstract

A criação de uma Área Europeia de Ensino Superior associada à mobilidade alargada de estudantes e à sua empregabilidade na Europa, tendo por base os objectivos do processo de Bolonha, mereceu um repensar profundo dos vários sistemas de créditos existentes na Europa, originando a necessidade das instituições de Ensino Superior procurarem medidas conducentes a um sistema de graus mais compatíveis e comparáveis. Uma medida importante delineada pela Declaração de Bolonha é a adopção de um sistema comum de créditos, como o ECTS (*European Credit Transfer System*).

Este artigo examina as implicações e transformações profundas que a Declaração de Bolonha tem originado na Europa, assim como o estado de desenvolvimento actual do processo de Bolonha em Portugal, relativamente à implementação do ECTS. Também se sugere um modelo do tipo "bottom-up" de aplicação do ECTS à estrutura curricular da licenciatura em Economia da Faculdade de Economia da Universidade do Algarve.

Palavras-chave: ECTS, Declaração de Bolonha, Ensino superior europeu

Resumo

The quest for a European Area of Higher Education together with wider student mobility and employability in Europe, as underlying objectives sought by the Bologna process, has entailed a radical rethinking of Europe's various credit systems. There is a need for institutions to seek compatible measures towards a more readable and comparable degree system. One important measure outlined by the Bologna Declaration is the adoption of a common system of credits such as ECTS (European Credit Transfer System).

The following work looks at how the Declaration has developed into a process that has assumed extensive proportions in Europe. We also look at the current state of the Bologna process in Portugal in terms of ECTS implementation and attempt to apply a "bottom-up" ECTS approach to a first cycle Economics degree programme.

Keywords: ECTS, Bologna declaration, European higher education

[1] The author gratefully acknowledges the helpful comments made by P.M.M. Rodrigues.

1. Introduction

Higher education systems are currently facing tremendous challenges in the pursuit for a common European Higher Education Area (EHEA) by 2010. The Bologna Process, a project so far mapped out by four distinctive events – that of Paris-La Sorbonne (May 1998), Bologna (June 1999), Prague (May 2001) and Berlin (September 2003), has become a key source in the framing of higher education reform in Europe. There is growing awareness within Portuguese higher education of the importance of the Bologna Declaration and the need to establish European coherence. The main thrust of the declaration consists in creating a European space for higher education in order to improve academic quality of higher education, to enhance the employability and mobility of citizens, and to increase international competitiveness and attractiveness. The idea of a European common market in higher education is a concept that is quickly flourishing with terms such as "European area" and "European space" holding increasing significance. Steered by the European Commission, the focus, on the one hand, is to promote wider student, researcher and academic staff mobility within the European area; on the other, to promote a compatible system that will increase the European share of the higher education market on a worldwide scale. Although individual member states hold sole responsibility and autonomy on internal educational policies, there is concerted effort in trying to develop a European cultural dimension through inter-institutional, trans-frontier cooperation. More specific measures include the adoption of a common system of credits such as ECTS[1] and a comparable degree system based on common degree cycles.

The Bologna Declaration has unquestionably set off a string of controversial issues relating to the future of higher education in Europe. In an effort to accommodate the principles outlined by the Declaration, higher education institutions are currently undertaking the ambitious task of redefining credit and grading schemes, degree structures, and as a direct result, academic curricula. Some countries are finding this process further hardened with students objecting to certain reforms. The main student union in France (UNEF) regards the Bologna process as "a pretext to undermine the essential principles of higher education as a public service and the rights of students" claiming only the most well-off students will be able to study abroad. They further argue that the new pan-European proposal for common degree cycles referred to as LMD (*licence, master, doctorat*) and representing three, five and eight years of university study, respectively, will encourage universities to compete for the best students and will lead to a "merchandising" of both French and European university systems.[2] The National Union of Students in Germany in a 2003 report[3] expressed concerns on the incorrect national implementation of the Bologna objectives with "political focus on isolated measures" and the progressive introduction of tuition fees as a result. The National Unions of Students in Europe (ESIB) condemned the

[1] The European Credit Transfer System (ECTS) underwent an experimental phase within the ERASMUS Programme (*European Community Action Scheme for the Mobility of University Students*) from 1989 to 1995, having initially been employed in five areas - Business Administration, Chemistry, History, Mechanical Engineering, and Medicine that involved 145 higher education institutions in all EU Member States and EFTA countries.

[2] www.wsws.org/articles/2003/dec2003/fran-d17.shtml

[3] www.esib.org/BPC/Countries/Germany/natrep_final.pdf

way the Bologna Declaration in Switzerland has been implemented by implementing such policies as "selective access to Master studies, a narrow interpretation of the ECTS key features, the implementation of assessment years, [and] not introducing a grant system that is fair and harmonised."

Despite apprehensions that have surfaced since the introduction of the Bologna declaration, it has served as an important source of dialogue between ministers and higher education leaders and actors in clarifying needed reforms and educational priorities. The *Trends III* report (2003) states that "more than two thirds of the heads of institutions regard it as essential to make rapid progress towards the EHEA" and provides a range of statistics on the internationalisation process and the implementation of Bologna degree structures in institutions of higher education across Europe.[4] Interestingly, non-signatory countries currently look to the Bologna process as a reference framework for their education policies and actively encourage its objectives[5].

Backed by European political agreement, the Bologna process understands a series of objectives aimed at improving and internationalising higher education. The Bologna declaration first established six targets: (i) adoption of a system of easily readable and comparable degrees; (ii) adoption of a system based on two main cycles (undergraduate/graduate); (iii) establishment of a system of credits (ECTS); (iv) promotion of mobility by overcoming obstacles to the effective exercise of free movement; (v) promotion of European co-operation in quality assurance; (vi) promotion of European dimensions in higher education. These objectives were later extended to nine as a result of the Prague Communiqué in 2001 which further added lifelong learning, the involvement of higher education institutions and students in the shaping of EHEA, and promoting the attractiveness of the EHEA. In Portugal, as far as the conditions under which institutions are trying to implement the Bologna reforms, such as credit transfer (credit accumulation) and the introduction of the two cycle system, national legislation has not yet set formal guidelines to legally bind institutions to restructure their system. Instead, individual institutional departments and faculties are often left to their own devices in coping with how best to implement Bologna measures urged upon them by the institution who in turn is pressed by the national government in its commitment to keep up with Europe's higher education plan.

The following sections examine the current state of the Bologna process in Portugal in terms of implementation of ECTS. Some of the concerns facing the particularities associated to the Portuguese higher education system are highlighted. We attempt to apply ECTS and what it entails through a case application, as well as propose a first attempt at a "bottom-up" model approach developed from an earlier "top-down" version.

[4] Trends III report (p. 3). The first Trends report, "Trends in Learning Structures in Higher Education" prepared for the Bologna 1999 meeting was instrumental in setting the objectives outlined in the Bologna Declaration. Trends II (2001) presented in Prague in 2001 broadened the geographic and thematic scope of the Bologna Process, analysing to a greater extent national structures. The third and most recent report EUA prepared for Berlin "Trends 2003: progress towards the European Higher Education Area", considered for the first time the views of higher education institutions and their students.

[5] Haug, G. & C. Tauch (2002).

2. European Credit Transfer System (ECTS)

2.1 Overview

The development of the European Credit Transfer System arose from the Bologna Declaration and was designed as a tool to facilitate European student mobility, in such programmes as *Erasmus*. Until recently, ECTS was used primarily as a credit transfer system, with its impact confined to a relatively small number of participating students. However, the role and importance of ECTS has changed and taken on much wider proportions to become a generalised credit system for the emerging EHEA. Its original goals were to enable students to receive credit for their studies abroad and facilitate student mobility. At the same time, it looked to motivate educational systems at a national and international level in developing more information on the various study programmes available.

However, since its launch in 1988, the practice of ECTS has been extended to the Socrates programme, other schemes such as *Leonardo da Vinci* and now as a fully-fledged component of higher education at a European scale. European higher education institutions, which have subscribed to the Bologna process, or look to do so in the future, have taken independent initiatives through national rectors' conferences and the European University Association (EUA) in the promotion, coordination and development of the system, originally headed by the European Commission. According to Adam (2001), there are several reasons for the unprecedented level of agreement about change, "individual European countries have woken up to the need to transform European education into something more attractive, efficient and suitable to the needs of twenty-first century economies." An important attraction resulting from recent ECTS developments has been its evolution into an accumulation system as well as a transfer system – an objective reached in the Prague Communiqué. The further development of ECTS into a credit accumulation system is in effect a way of mainstreaming its usage into as a generalised credit system that looks to promote greater horizontal and vertical mobility freedom within and between higher education institutions.

The Bologna declaration established that the basis for ECTS credit allocation should depend entirely on *student workload* and take into account *learning outcomes*, comprehending both in and out of classroom work such as lectures, seminars, assignments, private study, projects/dissertations and other assessment activities. The process of credit assignment under the ECTS framework understands that a four-year undergraduate study programme comprises, in total, a workload of 240 ECTS credits or 180 credits for a three-year programme. These credits break down into 60 credits per academic year and 30 credits per semester. The distribution of ECTS credits across different modules for a particular study programme should correspond to "the notional time an average learner might expect to complete the required learning outcomes."[6]

[6] European Commission, http://europa.eu.int/comm/education/programmes/socrates/ects_en.html

However, identifying how best to allocate credits to specific subject modules, in line with the ECTS philosophy, has been a matter of considerable debate; see inter alia Tait (2004) and Lavigne (2003). The allocation of credits to courses has prompted two separate but complementary approaches. The first sets about establishing ECTS credits following a "top-down" approach. That is, the overall structure of study degrees is taken as the reference basis to ultimately, "reflect the quantity of work each component requires in relation to the total quantity of work necessary to complete a full year's study." [7] It should be noted, however, that, on their own, credits do not describe the quality, complexity, level, or importance of courses rather they are merely numerical representations of student workload that each module requires in relation to the overall degree curricula. The second approach draws on a "bottom-up" procedure that analyses individual subject modules and corresponding study programmes in view of their learning outcomes. Learning outcomes (representing aptitudes developed after the successful completion of a module) is observed as a more realistic estimate of the relative workload necessary and thus credit representation to achieve those outcomes. National systems such as the UK adopt "notional learning time" as the basis for awarding credits, i.e, the number of hours a learner is expected to spend on average (at a particular level) in order to achieve specified learning outcomes for that level.[8] This approach requires that modules and curricula be designed in view of the objectives of the full study programme, along with achievable learning outcomes.

Further to the development of ECTS credits was the introduction of a shared system that secured the transfer of common, recognisable grades between different countries – an ECTS grading scale that would complement the specific grading traditions and philosophies of different countries. According to Haung (1997), "the fair interpretation of foreign grades into national ones is a major issue, both for students returning after a study period abroad and for university staff required to assess the credentials of foreign applicants." ECTS grades are specified according to a letter classification system formed by five passing letter scores from A to E, and two failing letter scores, F and FX with corresponding key definitions. While ECTS credits primarily indicate the quantity of work undertaken by a student, ECTS grades express the degree of quality of a student's performance. These letter scores rely on a statistical reference benchmark. For instance, an ECTS "A" grade is achieved by the top ten percentile of successful students and represents an "Excellent" score, "B" grade is defined as "Very good" and falls under the next twenty-five percentile group of successful students, "C" grade for the following thirty percentile group constituting a "Good" mark, "D" the next twenty-five percentile group as "Satisfactory", and "E" the bottom ten percentile group of successful students as "Sufficient". Grades "F" and "FX" are at the bottom of the scale and indicate a "Fail".[9] No further distinction is made with fail scores. However, awarding ECTS grades according to a percentile distribution of local grades can only take place where the number of students passing the evaluation/examination is sufficiently large enough to guarantee representativeness in order to avoid deviant results. The use of ECTS letter grades is a dynamic process

[7] Zürich, *Conclusions and Recommendations,* p.3.
[8] Tait, T. (2004) *LSDA Report. Credit Systems for Learning and Skills: Current Developments*, p.4
[9] The difference between the two is that FX indicates that further work required before the credit can be awarded while F denotes that considerable further work is required by the student in order to pass.

which requires careful calculation and monitoring on the part of teachers and coordinators so that maximum care in the translation of grades is ensured.

There have been a number of attempts in both Europe and in the United States, to produce formulas that automatically calculate foreign grades in the national grading system of the user. According to Haug (1997), this approach often does not produce figures that are a reliable and fair, with certain key characteristics of the ECTS grading systems inadequately represented. Proposals based on linear formulas can produce deviating results with grading traditions and policies differing from country to country. While in the United States or Italy, there is a standing attitude towards using the upper ladder of the grading scales, for instance, countries such as France and the UK seldom apply the top 20% of their scale. Grade inflation makes it more difficult to identify the truly exceptional students. Other case scenarios observe marked differences on the type and level of the grading institution and even the field of study. In France, a score of 11/20 can be seen as quite a strong grade even though the pass mark in France is usually 10/20.

In effect, the tendency is for countries to abolish traditional credit and grading conventions entirely, in favour of ECTS credits and grades. European higher institutions understand that as more countries align towards the ECTS norm, as the generalised basis for national credit systems with both accumulation and transfer capabilities, the greater the pressure on non adhering or lagging countries. The extension of ECTS is consequent of a process driven by a common effort to narrow the disparity of higher education systems in Europe. According to the ECTS Extension Feasibility Project report (2000), the possible development of ECTS as an overarching European credit accumulation and transfer framework with a lifelong learning perspective would bring important advantages such as, more flexible and efficient educational programmes, increased student and staff mobility, and a more transparent European education system.

2.2 The state of ECTS in Portugal

The Bologna process has contributed substantially towards Portugal's awareness of the need to converge and comply with the current trend of European higher education – that of strengthening the competitiveness and attractiveness of universities in Europe. The adoption of measures set by the Bologna declaration has been very slow in Portugal compared to fellow signatory countries. It was only in 2001, that the Council of Rectors of Universities in Portugal (commonly known as CRUP) published their perspective on the relevance of the Declaration and stated the importance of universities committing to this process of convergence. A proposal was drafted calling for universities to commit to the spirit of the Declaration by adopting ECTS in their curriculum. It specified that to achieve the objectives of the Declaration, higher national curricula in Portugal should secure, "the establishment of a compatible system of credits based on ECTS and the Diploma Supplement." With no government policies reinforcing this position, individual institutions took it upon themselves to motivate their own departments to develop information guides for Erasmus students and implement ECTS credits alongside local credit systems. In

2002, the Co-ordinating Council for Polytechnic Higher Education Institutions (otherwise known as CCISP) expressed its view on the Bologna process, acknowledging its relevance as well as the need for further national debate and legislative action. The Portuguese National Education Council[10] (2002) asserted that the Bologna Declaration represented an opportunity to reflect globally and strategically on higher education in Portugal and addressed the need to keep up with the dynamic global consolidation process of peer institutions within the European higher education space. With the Bologna process high on national and institutional agendas and a need to coordinate its development, CRUP created a specialised committee made up of university representatives for undergraduate, graduate and lifelong learning with the specific aim of reviewing the Portuguese credit system.

In terms of implementing specific Bologna measures such as ECTS, Portugal follows a distinct credit system based exclusively on classroom contact hours. According to the Portuguese system of credits (*cf.* Decree-law no. 173/80, 29th of May), one study credit corresponds to approximately 15 hours of lectures, 40 hours of tutorials, 22 hours of lecture/tutorial sessions and 30 hours of seminars or traineeship. Attributing ECTS credits and grades in its intended true spirit has been generally accepted as theoretically meaningful, but has raised several difficulties in practice. As a way of perhaps dealing with the complexities involved in adapting ECTS credits to local credit systems, some departments have preferred to adopt a top-bottom ECTS approach. This has led to a rudimentary implementation of ECTS credits whereby local credits (based on contact hours) are converted into an ECTS equivalent. The current European discussion surrounding the extension of ECTS into an accumulation system (as opposed to only transfer orientated) has also placed significant pressure on institutions to develop ECTS to its full extent, that is, based on a bottom-up approach. In terms of the Portuguese grading system, this represents a relatively straightforward process under the ECTS grading scheme, though requiring time-consuming effort and diligence on the part of teaching staff and coordinators; see Table A in Appendix for a case example.

Interpreting Bologna in the light of its goals and the whole context of its objectives has developed into an ambitious undertaking at the root level. Teaching structures, methods, content and evaluation, and the permeability between disciplines and institutions, is a task that still lies ahead for a majority of academics. In an attempt to develop a more accurate strategy able to more ideally determine ECTS credits for the Portuguese context, an ECTS model is proposed based on an undergraduate degree in Economics of four-year duration.

2.3.1 A Proposing an ECTS Model for FEUALG

As mentioned, we look to an Economics degree programme as an application basis for our study. In specific, we propose a model for the computation of ECTS credits for the Faculty of Economics of the University of Algarve. The model is set up

[10] Decision report by the Portuguese National Education Council, A Declaração de Bolonha e o Sistema de Graus no Ensino Superior, 31 Janeiro 2002

based on available data as well as through the use of some fairly representative assumptions taken from Faculty evaluation reports, detailed course curricula and other degree-related records with the aim of providing greater objectivity where data was not available. The approach presented represents a first attempt at a bottom-up ECTS approximation and is intended to serve as a springboard for discussion towards possible improvements.

In order to compute ECTS credits for a given semester, we consider two important elements as essential: i) the workload (WL) necessary for a course unit or module (henceforth referred to as *course*), and ii) the total workload (WL_T) for a given semester.

We achieve the weekly workload for a course, WL_k , using the following principle,

$$WL_k = \beta_k\gamma_k\{CH_k + SH_k + SH_{Ek} + SH_{Pk}\} \quad \textbf{(2.1)}$$

where CH_k represents the weekly contact hours for course k; SH_k the weekly study hours dedicated to course k; SH_{Ek} the weekly study hours towards examinations for course k and SH_{Pk} the weekly study hours towards specified coursework, projects and/or reports for course k. Parameters γ_k and β_k represent the relative level of difficulty of course k based on annual pass rate and the nature of a course (core or optional), respectively. The following Table establishes values for γ_k based on an annual pass rate (no. of successful students/total no. of students assessed):

(No. of successful students/Total assessed)	Level of difficulty ratio
[0, 50[	1.10
[50, 1]	1

The following expressions are used to differentiate the nature of the course in question,

$$\text{core courses:} \quad \beta_k = 1 + \varphi(\alpha)/\mu$$
$$\text{option courses:} \quad \beta_k = 1 - \alpha$$

where φ is the number of optional courses; α the reduction rate considered and μ the number of compulsory courses. For the case under consideration, we establish a reduction rate of 5% for option courses, that is,

$$\beta_k = 1 + \varphi(0.05)/\mu \ ,$$

approximated to the nearest integer value.

To determine the number of weekly SH_k we look to weekly CH for each k and assume that CH/2 represent the corresponding study hours. In order to obtain SH_{Ek}, we consider that students spend an average of 2 daily hours of study over a period of two weeks (14 days) for each course, totalling 28 hours of study (for the purpose of computing WL_k based on 14 weeks, that is, as 2 hours per week over 14 weeks). To

calculate SH_{Pk}, we assume that a student dedicates approximately the same amount of time towards coursework, projects and/or reports totalling 50% in weight or more for a particular course as for an exam, that is 2 hours per week over 14 weeks. Coursework, projects and/or reports of less weight are considered to require 1 hour of work per week over 14 weeks.

Once the workload for all courses is determined, the total workload for that semester can be calculated,

$$WL_{Total} = \Sigma^{5}_{k=1} WL_k \ .$$

Consequently, the ECTS for course k will then be calculated as,

$$ECTS_k = WL_k /WL_{Total} * 30 \ . \qquad \textbf{(2.2)}$$

.

We will exemplify this approach in the following section.

2.3.1.1 Looking at FEAULG's degree in Economics: First year programme

Consider FEUALG's undergraduate degree programme for first year Economic students whose total number of classroom contact hours is 25 hours per week for each semester (see Table 1).

For illustrative purposes, we will further need information regarding each course, such as, the number of contact hours, whether the course is subject to examination or not, whether any coursework, reports or/and projects are required, the number of independent study hours and the level of difficulty of the subject. Table 3 below presents the required information and describes in detail how the results were obtained.

Table 1: Summary Table for 1st year courses

ECONOMICS DEGREE PROGRAMME
YEAR 1

SEMESTER 1

COURSE UNIT	CH (per week)	Subject to exam*	Weight of coursework, projects or reports†	Core	SH (average amount of study time spent)	Level of Difficulty (γ_k) based on success rate
Economics I	6.0	yes	-	yes	3..00	1.00
Intro. to Management	6.0	yes	20%	yes	3.00	1.00
Maths I	6.0	yes	-	yes	3.00	1.00
General Principles of Law	3.5	yes	-	yes	1.75	1.00
Economic and Social History I	3.5	yes	50%	yes	1.75	1.05
Total	**25.0**					

† This column provides information on those courses that contain assessed coursework, projects or reports.

* *Subject to exam* corresponds to first exam or testing period which assesses the entire planned course curricula, and not second instance exams or resits.

SEMESTER 2

COURSE UNIT	CH (per week)	Subject to exam	Weight of coursework, projects or reports	Core	SH (average amount of study time spent)	Level of Difficulty (γ_k) based on pass rate
Economics II	6.0	yes	20%	yes	3.00	1.00
Financial Accounting	6.0	yes	25%	yes	3.00	1.10
Maths II	6.0	yes	-	yes	3.00	1.00
Commercial Law	3.5	yes	-	yes	1.75	1.00
Introduction to Social Sciences	3.5	yes	25%	yes	1.75	1.00
Total	**25.0**					

Once the relevant data has been worked out, we can apply (2.1) to determine the workload each course induces on an average full-time student. ECTS credits can then be established for each course by employing (2.2). Table 2 provides generated results according to the respective variables adopted.

Table 2: Computation of ECTS for 1st year courses (Semesters 1 and 2)

Semester 1

	Economics I	Intro. to Management	Maths I	Gen. Principles of Law	Economic and Social History I	
β_k	1	1	1	1	1	
γ_k	1	1	1	1	1.05	
CH_k	6	6	6	3.5	3.5	
SH_k	3	3	3	1.75	1.75	
SH_{Ek}	2	2	2	2	2	
SH_{Pk}	1	1	2	1	2	
WL_k	12	12	12	8.25	9.25	
WL_{TOTAL}	53.5					
ECTS	6.73	6.73	6.73	4.63	5.19	(=30)
ECTS (approx.)	7.0	7.0	7.0	4.5	4.5*	(=30)

* Since the ECTS credit approximation for Semester 1 courses raises various alternatives, preference was given at this stage to assign 4.5 credits for this course in line with an earlier top-down ECTS version (2002).

Semester 2

	Economics II	Financial Accounting	Maths II	Commercial Law	Intro. to Social Sciences	
β_k	1	1	1	1	1	
γ_k	1	1.1	1	1	1	
CH_k	6	6	6	3.5	3.5	
SH_k	3	3	3	1.75	1.75	
SH_{Ek}	2	2	2	2	2	
SH_{Pk}	1	1	1	1	1	
WL_k	12	13.2	12	8.25	8.25	
WL_{TOTAL}	53.7					
ECTS	6.70	7.37	6.70	4.61	4.61	(=30)
ECTS (approx.)	7.0	7.0	7.0	4.5	4.5	(=30)

2.3.1.2 Looking at FEAULG's degree in Economics: Fourth year programme

Under the same assumptions considered in the previous section for first year courses, the following Table with summary results was generated.

Table 3: Summary Table for 4th year courses (Semesters 1 and 2)

YEAR 4

SEMESTER 1

COURSE UNIT	CH (per week)	Subject to exam	Estimated study towards course exam (hrs.)	Weight of coursework, projects or reports	Core	SH (average amount of study time spent)	Level of Difficulty (γ_k) based on success rate
Marketing	4.5	yes	2	50%	yes	2.275	1
Operations Research	6.0	yes	2	-	yes	3.00	1
Planning & Econ. Policy	4.5	yes	2	50%	yes	2.275	1
Economics Integration Optional 1	3.0	yes	2	-	no	1.50	1
Reg. & Urban Economics Optional 2	3.0	yes	0	100%	no	1.50	1
Total	**21.0**						

SEMESTER 2

COURSE UNIT	CH (per week)	Subject to exam	Estimated study towards course exam (hrs.)	Weight of coursework, projects or reports	Core	SH (average amount of study time spent)	Level of Difficulty (γ_k) based on success rate
History & Econ. Thought	4.5	yes	2	-	yes	2.275	1
Portuguese & European Economies	4.5	yes	2	30%	yes	2.275	1
Project Evaluation	6.0	yes	2	30%	yes	3.0	1
Environmental & Natural Resource Econ. Optional 1	3.0	yes	2		no	1.5	1
Economic & Soc. History II Optional 2	3.0	yes	2	50%	no	1.5	1
Total	**21.0**						

According to Table B in the Appendix (based on student pass rates), we can establish that the level of difficulty for the fourth year courses is the same, that is, $\gamma_k = 1$ for all courses.

Based on the data from Table 3, we can apply (2.1) and (2.2) to compute workload and ECTS credits, respectively.

Table 4: Computation of ECTS for 4th year courses (Semesters 1 and 2)

Semester 1

	Marketing	Operations Research	Planning & Economic Policy	Economic Integration	Regional & Urban Economics
β_k	1.03	1.03	1.03	0.95	0.95
γ_k	1	1	1	1	1
CH_k	4.5	6	4.5	3.0	3.0
SH_k	2.5	3	2.25	1.5	1.5
SH_{Ek}	2	2	2	2	0
SH_{Pk}	2	1	2	1	2
WL_k	11.07	12.36	11.07	7.13	6.18

WL_{TOTAL} 47.81

ECTS	6.95	7.76	6.95	4.47	3.88	(=30)
ECTS (approx.)	7.0	7.5	7.0	4.5	4.0	(=30)

Semester 2

	History & Economic Thought	Portuguese & European Economies	Project Evaluation	Environmental & Natural Resource Econ.	Economic & Social History II
β_k	1.03	1.03	1.03	0.95	0.95
γ_k	1	1	1	1	1
CH_k	6	6	6	3.5	3.5
SH_k	3	3	3	1.75	1.75
SH_{Ek}	2	2	2	2	2
SH_{Pk}	1	1	1	1	1
WL_k	12.36	12.36	12.36	7.84	7.84

WL_{TOTAL} 54.76

ECTS	7.03	7.03	7.03	4.46	4.46	(=30)
ECTS (approx.)	7.0	7.0	7.0	4.5	4.5	(=30)

2.3.2 Some remarks

In calculating ECTS credits for first and fourth degree courses that comprise the FEAULG's Economics degree for undergraduates, we looked to differentiate core courses from option courses. Core courses feature a higher workload. Note also that the ECTS credits attributed to each course took into consideration the ECTS principle

that 1 ECTS should roughly correspond to 25-30 student working hours. Furthermore, the computation of the weekly workload took into consideration the current practice of FEUALG in following a 14 week semester and examination period. This may at times result in the final ECTS credit being slightly overrated. For example, History of Economic Thought corresponds to a minimum of 7 x 25 = 175 study hours. However, the weekly workload computed for this course is 11.845, which corresponds in a 14 weeks semester to 11.845 x 14 = 180.25 hours.

In attempting to determine how best to obtain a fitting model, it became increasingly apparent that the difficulty lies not so much in collecting and treating relevant data but rather how to handle distortions in the evaluation of workload. Student workload in some fields of study, such as quantitative methods, can be quite extensive yet unfairly represented in the credits acquired. The main policy challenge for institutions is to consolidate ECTS as a means to restructure and develop curricula with the aim of creating flexible student-centered learning paths.

3. Conclusion

Fundamental changes are taking place in Europe within the higher education sector. These changes are driven in part by changes within the European labour market and in part by an increased mobility through increased standardisation of qualifications within Europe. The objective of this paper is twofold. The first, to provide an overview of the state ECTS in the Portuguese higher education system, the second, to propose a compatible ECTS model relevant to FEUALG's Economics degree programme. ECTS is now moving from a peripheral activity to a core activity for institutions. There is strong awareness that if Bologna objectives such as ECTS are not met, institutions will lose out in their bid for global competitiveness and employability of its citizens in the international labour markets. In order to establish these objectives there is a need to develop coherent curricula through analysis and dialogue based on learning outcomes. These changes will fundamentally challenge our notion as to how, what and whom we teach, as well as how we assess, as learning becomes more student-centred and flexible as credit-based systems.

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APPENDIX

Table A: Grading Examples

Consider two examples of 10 students with passing grades: Example 1 (10,10,10,11,11,11,12,12,13,15) and Example 2 (10,11,11,12,12,13,14,14,16,18).

Example 1

Marks	Relative Frequency	Cumulative Frequency	ECTS Grades
10	0.3	0.3	D
11	0.3	0.6	C
12	0.2	0.8	B
13	0.1	0.9	B
15	0.1	1	A

Example 2

	Relative Frequency	Cumulative Frequency	ECTS Grades
10	0.1	0.1	E
11	0.2	0.3	D
12	0.2	0.5	C
13	0.1	0.6	C
14	0.2	0.8	B
16	0.1	0.9	B
18	0.1	1	A

Setting up a (relative and cumulative) frequency table with the passing grades, the ECTS grades are attributed based on the following rule: Based on the column of the cumulative frequencies, as shown with the above two examples, the marks falling in the ranges]0%, 10%],]10%, 35%],]35%, 65%],]65%, 90%] and]90%, 100%] are attributed an E, D, C, B and A, respectively.

Table B: Student pass rate of first and fourth year Economic degree courses (used to calculate level of difficulty)

Year	Sem	COURSE	SUCCESS RATE/ TOTAL ASSESSED %
1	1	Economics I	63
1	1	Introduction to Management	65
1	1	Maths I	80
1	1	General Principles of Law	78
1	1	Economic and Social History I	57
1	2	Economics II	65
1	2	Financial Accounting	35
1	2	Maths II	77
1	2	Commercial Law	94
1	2	Introduction to Social Sciences	67
4	1	Marketing	95
4	1	Operations Research	94
4	1	Planning & Economic Policy	100
4	1	Economics Integration	92
4	1	Regional & Urban Economics	83
4	2	History & Economic Thought	69
4	2	Portuguese & European Economies	82
4	2	Project Evaluation	84
4	2	Environmental & Natural Resource Economics	100
4	2	Economic & Social History II	100

(Source: Evaluation report for the Economics degree programme of the Faculty of Economics, University of Algarve produced by the Internal Assessment Committee for the External Assessment Board, 2004).