A Benchmarking of the Undergraduate Economics Major in Europe and in the United States[†]

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Abstract

We compare the undergraduate Economics majors and their underlying structure in the top-ranked Economics departments of Europe and the USA, identifying the fundamental courses included in an Economics major in top-ranked universities. We further distinguish between those courses that are required and those that are usually offered as electives, finding striking differences between Europe and the USA, especially regarding the nature of the main electives offered. The insights from this comparative study may be useful for the ongoing restructuring of undergraduate Economics majors in European countries caused by the Bologna Process.

Introduction

In this work we compare the undergraduate Economics majors and their underlying structure in the top-ranked Economics departments of Europe and the USA. We also identify the main courses that are included in an undergraduate Economics major by top-ranked universities. The insights from this comparative study may be useful for the ongoing restructuring of undergraduate Economics majors in some European countries.

North-American universities typically occupy the top positions in worldwide rankings of higher education institutions.[1] This trend is even more pronounced in the ranking of Economics departments, where US institutions can occupy as much as 18 positions in the top 20 (Kalaitzidakis *et al*., 2003). In this specific ranking, we must look at the top 40 departments to find six European institutions.

European policymakers already recognise the competitiveness gap between the two regions regarding higher education and scientific research. Narrowing the gap has been established as a top priority by European governments. Specific steps have been taken with this purpose in mind, namely in what is called the Bologna Process. This Process results from the intention of creating a single European Higher Education Area, mentioned in the Sorbonne Declaration signed in 1998 and reinforced in the Bologna Declaration, signed in 1999 by 29 European ministers of Education. Since then, the number of signatory countries has increased to 45.

Our study will not handle general competitiveness problems or broad higher education reforms. We aim primarily to provide information that is important for the reform of Economics education, especially in European countries. The Bologna Process is already implying structural changes in the academic curriculum, especially in those countries where undergraduate degrees will be shortened, as can be seen in the national implementation reports of the signatory countries of the Bologna Process.[2] This creates a need to analyse the several courses offered in European Economics degrees and decide which are essential in an undergraduate course. The top-ranked universities' degrees are a good reference point to look at during the reform process. This is why we chose not to analyse a random sample of Economics degrees, which would be a good method to describe the existing situation but would not be as good at providing guidelines for reform. We thus turn to a benchmarking approach to analyse the existing best practices. For this exercise, we believe the comparison with the USA is useful, since North-American universities are always positioned in the first places of international rankings. However, we must be aware of the specificities of the European education context: for instance, differences regarding secondary education may imply differences in the design of academic curricula in European universities or even between different European countries.

UNESCO defines benchmarking as 'a standardized method for collecting and reporting critical operational data in a way that enables relevant comparisons among the performances of different organizations or programmes, usually with a view to establishing good practice (…)' (Vlăsceanu *et al*., 2004). The exercise is considered useful because it 'gives the organization (or the programme) the external references and the best practices on which to base its evaluation and to design its working processes' (*ibid*.). Dearden *et al*. (2001) have used the technique to survey economics departments in private universities. The authors recall that 'it is important to stress that the purpose of a benchmarking survey is not quite the same as that of an ordinary survey. In a benchmarking survey, the goal is to ascertain the characteristics and practices of certain other institutions for comparison, modelling, or even aspirational purposes.' Our purpose is different as

we focus on the curriculum of the undergraduate degrees and not on the general activity of the departments.

Some researchers have focused on the content of specific courses within the Economics major as in Becker (2000) and Gärtner (2001), although the latter also studied the duration and structure of degrees in an introductory way. We choose to focus on the undergraduate Economics majors' study plan, comparing the leading Economics institutions in Europe and in the USA. Our benchmarking approach is also an innovation in Economics' curriculum studies. The structure of the Economics major is summarily described in Siegfried *et al*. (1991) for the USA and in Gärtner (2001) for Europe, but no study that we know of compares the majors between the two regions. Besides this comparison, we also identify the main courses that are usually included in an undergraduate Economics major and test our empirical findings by means of a cluster analysis.

This article is divided into five sections. The second section explains the methodology we used. The third section presents a comparison between the Economics major in USA and in Europe in terms of length and structure and the fourth section uses cluster analysis to infer some similarities and differences between the two regions. The fifth section concludes.

Methodology

Our study's goal is twofold. On the one hand we aim to identify the main courses that are included in an undergraduate Economics major. On the other hand we mean to compare the best practice in Europe and in the USA in this respect.

To meet these goals we choose a benchmarking approach, instead of drawing random samples from the existing universities in these two regions. More than a description of a random sample of Economics majors we wanted to investigate the course structure in the leading and most prestigious institutions, so that our results could provide guidelines for the undergoing restructuring process in Europe. Therefore, we had to establish some quality criterion for selecting the institutions that would provide the basis for our analysis. As far as our knowledge goes, there is no worldwide comparative assessment of teaching quality that would allow us to rank universities, forcing us to consider alternative criteria. A university's ranking is commonly based on its publication volume and the impact of its faculty's research in peer-reviewed scientific journals. Although the relationship of research productivity and teaching effectiveness is not universally accepted, some authors do find a positive relationship between the two (Jenkins *et al*., 1998), especially in the social sciences (Smeby, 1988; Centra, 1983).

We use a ranking of Economics departments instead of a general ranking of universities due to the specific nature of our study. We follow the Economics departments' ranking by Kalaitzidakis *et al*. (2003), which is one of the most recent rankings. The ranking is constructed based on the articles published and cited in the top 30 scientific Economics journals. The journal ranking itself is also updated by Kalaitzidakis *et al*. (2003), based on article citations to avoid biases that could be introduced by using an outdated journal ranking.

After selecting the 20 highest-ranking universities in each region (see Appendix A, Table A1), we analysed the study plans of their undergraduate Economics majors for the school year 2004–05.[3] The data were collected through the degree description in university websites. A typology of 118 courses was created to accommodate all possible choices given to the students (see Appendix A, Table A2). Special attention was given to sub-fields of Economics, which were disaggregated into 62 possible types. We wanted to be as exhaustive as possible regarding courses in Economics. Related scientific fields were given a lower level of disaggregation: Management with 22 types, Social Sciences with ten types, Quantitative Methods with six types, Humanities with six types, Law with five types and Skills with two types. All other possibilities were accounted for in a more aggregate manner with single classes for Computer Science, Engineering, Foreign Languages, Natural Sciences and Physical Education.

For each of the two regions we collected information on three key dimensions: the existence of the course, its required or optional nature and the number of semesters required. Not all universities organise their school year in semesters. For those which do not, we convert into semesters the number of required periods in the study plan. A replacement of the 'number of semesters required' dimension for one based on credits would be of value, since the same course can have different hour requirements and different levels of complexity in each university, but the information about credit units was not readily available from all universities and was not coherent throughout the samples. In Europe, the widespread implementation of a homogeneous European Credit Transfer System (ECTS) was not completed at the time of our study. Even in the USA, the definition of the total number of credits required for an undergraduate degree differed across the universities investigated.

From the data collected, we constructed four variables for each region: average percentage of universities that offer the course, average percentage of universities that require the course, average number of required semesters in the universities that require the course and average number of required semesters considering all universities. We used these variables to group the several courses into

homogeneous classes in order to ascertain which essential courses make up an Economics major nowadays in top-ranking universities. We make use of cluster analysis to reinforce our conclusions, giving less room for subjectivity in our grouping exercise. We apply hierarchical aggregation procedures based on the Euclidean distance between groups. Using SPSS, we perform not only a global cluster analysis (for the entire data set), but also partial cluster analysis for each region and each dimension to fully explore the differences between them.

Undergraduate Economics majors in the USA and in Europe

In this section we will be focusing on the structure of the undergraduate Economics majors in Europe and in the USA. It is important, however, to stress a significant difference between regions in the structure of higher education degrees. In the USA, a bachelor degree has three components: the university or college requirements, the major requirements and a usually optional minor. University/college requirements usually consist of courses that have the objective of broadening the students' knowledge in other fields of study besides the one they will be majoring in. Such requirements commonly include writing courses, foreign language courses, courses intended to increase students' knowledge of American society, culture or institutions, and courses that endow them with a liberal education in such different fields as Arts, Literature and Humanities, Natural and Physical Sciences and Quantitative Methods. University requirements typically take at least one year to fulfil. The major is the field of study the students choose to specialise in. The largest part of a student's time is spent fulfilling the major requirements. Finally, the minor is a coherent set of at least six courses on a different field. Minors are organised and offered by several university departments.[4] Students may use their electives to satisfy the requirements to apply for a minor, but they are usually not required to do so to complete their undergraduate degrees. They may use their electives to specialise even further in their major subject. We do not have data on the proportion of students in Economics undergraduate programmes in the USA that choose to complete minors. We also do not look into the contents of the minors that Economics students may choose because the task would be daunting, given the large array of possible choices available within universities.

European degrees are generally more focused on the subject field of specialisation the students choose at the beginning and, although they may include courses from other fields, their structure is usually not divided as in the USA into course requirements, major requirements, and minor specialisations.

The length of North American degrees is usually four years. Fulfilling the major requirements should take up to three years. In Europe, if we consider the current 45 signatory countries of the Bologna Process, only 44% of them have three-year degrees. However, if we consider only the original signatory countries of the Bologna Declaration in 1999, the number rises to 62%. If we further restrict our analysis to the 20 top-ranked European institutions, the proportion increases to 67%. Following the Bologna recommendations of comparability, some European countries, like Belgium and Portugal, have already decided to shorten their Economics degrees to three years. Therefore, we believe it is more sensible to compare the European degrees with the North-American major. In the USA, major requirements are not restricted to Economics courses, but they usually also include other relevant fields such as Quantitative Methods. A student may use the same course to satisfy both the major and the general degree requirements if applicable. Therefore, we do not risk leaving out related courses by focusing on the major. Only unrelated breadth requirements are left out of the analysis.

Data analysis

In the following section we analyse in more detail the data on the European and North-American Economics majors, in order to identify the main required and offered courses and the most important differences and similarities between both regions. Cluster analysis is used to introduce objectivity into the selection/grouping process and to support our main findings.

Main courses

The global cluster procedure returns two very different groups of observations (courses) both in number and in their characteristics.[5] The six following courses stand out in one group as the main required courses in the European and North-American Economics majors: Introduction to Economics, Macroeconomics, Microeconomics, Econometrics, Mathematics, and Statistics. We call these the *core courses*, because these are the courses we find in any undergraduate Economics major, the basic branches of Economics (Macroeconomics, Microeconomics, and Introduction to Economics) and instrumental Quantitative Methods courses (Mathematics, Statistics, and Econometrics). These courses are characterised by much higher average percentages of universities that offer or require its courses and a much higher average number of required semesters than in the other remaining courses, which form a much larger and more heterogeneous group. They are offered in virtually all majors analysed, with the exception of Introduction to Economics, which is offered only by 60% of the European universities (100% in the USA). They are all required by the majority of the universities in both regions. Micro

and Macroeconomics are required everywhere. An average of two semesters is required for each of the six courses, with the exception of Introduction to Economics in Europe (with only one semester on average across all universities, but two on the ones that do require it), Macroeconomics in Europe (three semesters required on average), and Statistics and Econometrics in the USA (only one semester required on average).

Comparison of Europe and the USA

In this section we identify the specificities for Europe and the USA and also perform separate cluster analysis for each one, which enables us to corroborate the subsequent results.

Main courses in Europe

If we cluster the courses in two groups in the data for Europe we get a group with 13 observations (cluster 2) and another with the remaining 105 (cluster 1), as we can see in Table 1.[6] The 13 courses in cluster 2 are the six core courses, three sub-fields of Economics (Industrial Organization, International Trade, and Public Economics), three sub-fields of Management (Accounting, Business Management,

Table 1: Descriptive statistics of the cluster analysis for Europe

		N	Mean	Std. deviation	Minimum	Maximum
Universities that offer the course (%) – Europe	1	105	.25527	.218900	.000	1.000
	2	13	.89615	.126592	.600	1.000
	Total	118	.32587	.291284	.000	1.000
Universities that require the course (%) – Europe	1	105	.07095	.096022	.000	.500
	2	13	.60000	.264575	.550	1.000
	Total	118	.12924	.207480	.000	1.000
Average number of required semesters in the universities that require the course – Europe	1	105	.74945	.942264	.000	7.000
	2	13	1.87277	.439431	1.636	2.750
	Total	118	.87320	.966320	.000	7.000
Average number of required semesters considering all universities – Europe	1	105	.09857	.149592	.000	.900
	2	13	1.21538	.803478	.900	2.750
	Total	118	.22161	.457627	.000	2.750

and Corporate Finance) and one related social science (Economic History). This result shows the importance that courses in Management have in European Economics majors. Cluster 2 clearly has higher average percentages of universities offering the courses or requiring them and a higher average number of required semesters.

If we increase the number of groups to four, the previous cluster 2 breaks up with Macroeconomics, Microeconomics, Econometrics, Mathematics, and Statistics in one group and the remaining eight courses in the other. The former has the highest average levels in all variables except the average number of required semesters in universities that require the course. Finally, the Seminar course (which is a course with variable applied themes) breaks up from cluster 1 to form an individual class.

Main Courses in the USA

When we cluster the courses in two groups in the USA data we get exactly the same groups obtained for the global analysis, with the six core courses forming one group and the remaining courses in the other group. The descriptive statistics for these two groups are presented in Table 2.

Table 2: Descriptive statistics of the partial cluster analysis for the USA

		N	Mean	Std. deviation	Minimum	Maximum
Universities that offer the course (%) – USA	1	112	.32679	.320116	.000	1.000
	2	6	1.00000	.000000	1.000	1.000
	Total	118	.36102	.345368	.000	1.000
Universities that require the course (%) – USA	1	112	.00893	.036276	.000	.250
	2	6	.90000	.173205	.550	1.000
	Total	118	.05424	.202925	.000	1.000
Average number of required semesters in the universities that require the course – USA	1	112	.11786	.378288	.000	2.000
	2	6	1.70483	.444127	1.105	2.150
	Total	118	.19855	.516506	.000	2.150
Average number of required semesters considering all universities – USA	1	112	.01027	.040901	.000	.300
	2	6	1.57500	.588005	.650	2.150
	Total	118	.08983	.368153	.000	2.150

It is worthwhile looking at what the grouping would look like if we had set the number of clusters to four in the USA and compare it to Europe's result. One result would be a break-up of the *core courses* group with Introduction to Economics, Microeconomics, Macroeconomics, and Mathematics forming one cluster and Statistics and Econometrics in another cluster. The first group has higher levels of course requirement and duration requirement.

The second result from the increase in the number of clusters is the appearance of seven new courses in another group, including three sub-fields of Economics (International Trade, International Finance, and Labour Economics), three applied courses within Economics (Seminar, Applied Economics, and Thesis), and a related Social Science (Economic History). This group has very high offering levels and very low requirement levels. This result demonstrates that electives in US majors are mainly concerned with giving *breadth* to the students' knowledge, through the offering of several courses in sub-fields of Economics, and providing *depth* to their research capabilities, through the offering of applied courses and seminars. These findings are consistent with the recommendations made by Siegfried *et al*. (1991).

Required courses

After having delved into the regional differences, we now look into each dimension selected in our study, starting with the requirement nature of the courses in both regions. The *core courses* stand out again with higher requirement levels in both regions (this is confirmed by a partial cluster analysis on this variable alone). The *core courses* are required in the majority of the universities analysed in either region. In the USA we found no other courses with a requirement level above 25%, rendering the USA majors' structure quite flexible and with easily identifiable fundamental courses. The majors in Europe are more rigid, with a greater number of required courses. The following courses are required in 30–50% of European universities: instrumental Economics courses (Thesis and Applied Economics), sub-fields of Economics (International Trade, Industrial Organization, Public Economics, Economic Policy, Economics of Information and Uncertainty, and Game Theory) and also courses from other scientific fields, namely Management (Business Management, Accounting, and Corporate Finance), Social Sciences (Economic History), Law (Introduction to Law), and Computer Science. The inclusion of Management, Law, and Computer Science courses in Economics majors may reflect a strategy to provide the students with specific skills in related fields with higher employability, in a context where economists compete with business graduates in firms, and also with a perceived decline in the demand for Economics courses.[7]

Clearly, there are differences in the course structure design in Europe and in the USA. They are not entirely explained by the existence of previous university

requirements in the US institutions, which are composed of wider scientific areas, like Humanities, Natural Sciences or Foreign Languages, and are not focused on the above-mentioned scientific fields clearly showing the difference between both regions major's requirements.

Offered courses

The main courses offered as electives in an undergraduate Economics major deal with specific sub-fields of Economics. This feature is more striking in the USA than in Europe, where other scientific fields stand out as important electives as well, as can be seen in Table 3, which lists the most offered courses in an Economics major in Europe and in the USA (at least in 50% of the universities in one of the regions), grouped in classes according to the relative importance they present in each region.

Obviously all the *core courses* appear in Table 3, especially in Group 1. In Group 1 we find some of the traditional working subjects of Economics, namely the public sector, the regulation of the economy, the international environment, and the financial markets and banking sector, both in developed and developing economies.

The other remaining groups, with the exception of Group 6, highlight the difference between the two regions. In the USA, other important electives are mainly concerned either with a sub-field of Economics, with the application of theory to specific regional economies, or with developing the students' competence to practise research. As for Europe, we find once again that Economics majors tend to give greater importance to other scientific fields, such as Management, Law, Computer Science, Social Sciences, and Foreign Languages.[8] The difference between both regions may be partly attenuated by the fact that, in the USA, students may choose a minor in a separate field. However the large array of choices the students have for their minor and the fact that it consists of a specialisation in another field and not a set of disciplines aiming to give breadth to their knowledge or competences to favour employability hinders any comparison attempt in this regard.

A partial cluster analysis on the offering level of the courses in both regions can also be performed. The result is that the number of courses included in the group that stands out with the highest average offering levels is much higher. They are the six *core courses* plus 11 sub-fields of Economics (Money and Banking, Development Economics, Environmental Economics, Financial Economics, Game Theory, History of Economic Thought, Industrial Organization, International Finance, International Trade, Labour Economics, Public Economics), two sub-fields of Management (Accounting and Corporate Finance), two applied Economics courses (Applied

Table 3: Offered courses

Group 1 – *Courses offered by more than 75% of the universities in both regions*
• Macroeconomics • Microeconomics • Mathematics • Industrial Organization
• Statistics • Econometrics • International Trade • Public Economics
• Development Economics • International Finance • Financial Economics
• Money and Banking

Group 2 – *Courses offered by more than 75% of the universities in Europe and between 50% and 75% in the USA*
• Corporate Finance • Accounting

Group 3 – *Courses offered by more than 75% of the universities in the USA and between 50% and 75% in Europe*
• Introduction to Economics • Applied Economics • Environmental Economics
• Labour Economics • Game Theory • Thesis • Economic History

Group 4 – *Courses offered by more than 75% of the universities in Europe and less than 50% in the USA*
• Business Management

Group 5 – *Courses offered by more than 75% of the universities in the USA and less than 50% in Europe*
• Transition Economics • Public Choice • Public Finance • Seminar
• Law and Economics • Health Economics • Natural Resource Economics

Group 6 – *Courses offered by more than 50% and less than 75% of the universities in both regions*
• Economic Policy

Group 7 – *Courses offered by more than 50% and less than 75% in Europe and less than 50% in the USA*
• Computer Science • History of Economic Thought • Marketing • Sociology
• Political Science • European Economic Integration • Other sub-courses of Law
• Business Strategy • Foreign Languages

Group 8 – *Courses offered by more than 50% and less than 75% in the USA and less than 50% in Europe*
• Economic Growth • Social Economics • Demography and Population Economics
• Economics of Information and Uncertainty • Topics in Economic Theory
• Asian Economy • Urban Economics • Latin American Economy
• Economics of Discrimination

Economics and Thesis), one related social science (Economic History), and Computer Science.

Average number of required semesters

Finally, we focus on the variables regarding the average number of required semesters. As was mentioned before, the lack of comparable credit allocations between and within regions impedes us from using them as a first-best variable in measuring each required course's importance in the degrees. Therefore, we make use of the number of semesters required as a second-best option. Here, the courses that stand out are Introduction to Economics, Microeconomics, Macroeconomics, and Mathematics, which are courses that combine a greater length of attendance requirements (two semesters on average) and a greater proportion of institutions requiring the course. Statistics and Econometrics, the remaining *core courses*, are left out of cluster 2 mainly because in the USA majors only one semester is required, as mentioned before. Nevertheless, this can be offset by the inclusion of quantitative methods courses in the university requirements and a significant scope of electives in Econometrics.

Conclusions

The results of our benchmarking approach combined with cluster analysis clearly show the main courses included in the undergraduate Economics majors of the top-ranking institutions in Europe and in the USA. They further allow us to distinguish between those that are required and those that are usually offered as electives.

The conventional major requirements consist of a set of courses that introduces the student to the basic principles of Economics and to the main quantitative methods techniques, and also leads them to the intermediate levels of analysis in macroeconomics and microeconomics. This core is similar in both regions. The courses most often offered as electives apply the core theoretical principles to a scope of economic sub-fields, ranging from the public to the private sector, from domestic to international economic affairs, from monetary and financial markets to labour and goods markets. However, we find striking differences between the USA and Europe in the nature of the main electives offered. While in the USA we typically find research-oriented and applied courses in Economics, in Europe the institutions give greater importance to courses in related scientific fields, like Management, Law, Social Sciences, and Computer Sciences.

We chose for our study only the top-ranked institutions in Europe and in the USA, according to publication volume and impact of their research in peer-reviewed

scientific journals. More than a description of a random sample of Economics majors we wanted to investigate the course structure in the leading and most prestigious institutions, so that our results could provide guidelines for the undergoing restructuring process in Europe. This approach is not without its critics, especially because it is based on research rankings and not on the quality of teaching in each of the institutions. However, to our knowledge, there is no worldwide ranking of institutions based on quality of teaching. Part of the undergoing changes in the higher education system in Europe caused by the Bologna Process are related to the main goal of the Lisbon Agenda, i.e. making Europe the most dynamic knowledge economy in the world by 2010. The results of these processes are not clear yet, making the comparison between the USA and Europe especially relevant. A good avenue for future research would be to compare them again in a few years, regarding the length of degrees, course structure and institutional rankings, to investigate the impact of the Bologna Process in bringing the European Economics departments closer to their leading North-American counterparts.

Appendix A

Table A1: Selected universities in Europe and in the USA

	European Ranking Position[9]	USA Ranking Position	World Ranking Position
Harvard University (USA)	–	1	1
University of Chicago (USA)	–	2	2
Massachusetts Institute of Technology (USA)	–	3	3
Northwestern University (USA)	–	4	4
University of Pennsylvania (USA)	–	5	5
Yale University (USA)	–	6	6
Princeton University (USA)	–	7	7
Stanford University (USA)	–	8	8
University of California, Berkeley (USA)	–	9	9
New York University (USA)	–	10	10
Columbia University (USA)	–	11	11
University of California, San Diego (USA)	–	12	12
University of Michigan (USA)	–	13	13
University of California, Los Angeles (USA)	–	14	14
Cornell University (USA)	–	15	15

Table A1: Selected universities in Europe and in the USA (continued)

	European Ranking Position[9]	USA Ranking Position	World Ranking Position
University of Texas, Austin (USA)	–	16	16
University of Rochester (USA)	–	17	17
Tilburg University (Netherlands)	1	–	18
University of Wisconsin, Madison (USA)	–	18	19
London School of Economics (UK)	2	–	20
University of Minnesota (USA)	–	19	21
Boston University (USA)	–	20	22
University College of London, IFS (UK)	3	–	34
University of Cambridge (UK)	4	–	39
University of Oxford (UK)	5	–	40
Université de Toulouse (France)	6	–	46
Universitat Autònoma de Barcelona (Spain)	7	–	50
University of Amsterdam (Netherlands)	8	–	51
Universitat Carlos III de Madrid (Spain)	9	–	52
University of Essex (UK)	10	–	54
Universitat Pompeu Fabra (Spain)	11	–	55
Catholic Université de Louvain (Belgium)	12	–	56
Erasmus University (Netherlands)	13	–	57
Stockholm School of Economics (Sweden)	15	–	61
University of Warwick (UK)	16	–	64
University of Vienna (Austria)	17	–	65
University of Bonn (Germany)	18	–	67
University of Copenhagen (Denmark)	19	–	70
University of York (UK)	20	–	71
University of Southampton (UK)	21	–	72

Source: Kalaitzidakis *et al*. (2003)

Table A2: List of courses and scientific fields

Scientific area	Course	
Computer Science	Computer Science	
Economics	African Economics	Agricultural Economics
	American Economy	Applied Economics
	Asian Economy	Contract Theory
	Cultural Economics	Development Economics
	Development Projects	
	Dynamic Modelling for Economists	
	Economic Growth	Economic Policy
	Mass Media Economics	Economics of Crime
	Economics of Defence	Economics of Discrimination
	Economics of Education	
	Economics of Information and Uncertainty	
	Economics of the Family	Economics of the Firm
	Environmental Economics	European Economic Integration
	Evolutionary Economics	Experimental Economics
	Financial Economics	Game Theory
	General Equilibrium Theory	Health Economics
	History of Economic Thought	Industrial Organization
	Economics of Innovation	Institutional Economics
	International Finance	International Trade
	Introduction to Economics	Labour Economics
	Latin American Economy	Local Government and Finance
	Macroeconomics	Methodology of Economics
	Microeconomics	Middle-East Economics
	Money and Banking	National Accounts
	National Economy	Natural Resource Economics
	Public Choice	Public Economics
	Public Finance	Regional Economics
	Seminar	Services Economics
	Social Economics	Sports Economics
	Teaching Economics	Thesis
	Topics in Economic Theory	Tourism Economics
	Transition Economics	Transport Economics
	Urban Economics	Global Economy
Engineering	Engineering	
Foreign Language	Foreign Languages	

Table A2: List of courses and scientific fields (continued)

Scientific area	Course	
Humanities	Ethics	International Relations
	Philosophy	Political Science
	Religion	(Others: Arts, Architecture, Literature, National Language …)
Law	Law and Economics	Economic Law
	Fiscal System	Introduction to Law
	Other sub-courses of Law	
Management	Accounting (Financial Accounting / Cost Accounting)	
	Auditing and Management Consultancy	
	Banking Management	Business Strategy
	Business Management	Commercial Management
	Corporate Finance	E-business
	Entrepreneurship	Human Resource Management
	Information Systems Management	
	International Business Management	
	Leadership	Logistic Management
	Management Control	Marketing
	Negotiation	
	Production and Operations Management	
	Project and Investment Management	
	Quality Management	Services Management
	Management	
Natural Sciences	Natural Sciences	
Physical Education	Physical Education	
Quantitative Methods	Data Analysis	Econometrics
	Mathematical Finance	Mathematics
	Operational Research	Statistics
Skills	Development of Skills	Internship
Social Sciences	Anthropology	
	Demography and Population Economics	
	Economic History	Geography and Urban Planning
	History	
	Social Psychology of Organizations	
	Psychology	
	Psychology and Economics/Behavioural Economics	
	Social Work	Sociology

Notes

1 The institutions that occupy the first places in both general university rankings and in the ones for Economics departments tend to be quite similar, and they do not change much throughout the years. The possible bias in choosing a particular ranking is thus limited. One example of a general ranking for US colleges can be seen in: http://colleges.usnews.rankingsandreviews.com/usnews/edu/college/rankings/brief/t1natudoc_brief.php

2 The National Implementation Reports are available from: http://www.bologna-bergen2005.no.

3 Israeli universities were not considered in our analysis, although they are classified as European by Kalaitzidakis *et al*. (2003) and they appear on the first 20 leading European institutions, since Israel is not a signatory of the Bologna Process.

4 Minors in Economics typically include courses on Microeconomics and Macroeconomics, more advanced optional courses on specific Economics subjects and sometimes Quantitative Methods courses, thus constituting a coherent study plan in Economics, although of much smaller length than a major. Minors can also be study programs in specialised fields within a scientific field.

5 The distance coefficients, which measure the degree by which clusters created differ, resulting from a global cluster analysis for all variables and regions point to an optimal number of only two clusters. Results stated in the text but not presented for space reasons, are available from the corresponding author.

6 The analysis of the distance coefficients for Europe points to an optimal number of four clusters. However, we focus on the grouping of courses in two clusters to guarantee coherence with the remaining groupings in the study, namely the one for the USA and the global analysis under the heading *Main analysis*.

7 The demand for undergraduate economics degrees presents mixed results in the USA. For example, for the time span 1990–04, demand has been experiencing significant expansion periods as well as considerable consecutive reductions (Siegfried, 2005).

8 Foreign Languages represent a special case, since they are important in fulfilling university requirements in the USA.

7 In the European ranking, the institution ranked 14th in (Kalaitzidakis *et al*. 2003), which is INSEE – L'Institut National de la Statistique et des Etudes Economiques (ranked 58th in the world), was excluded because it is a research and statistical institute and not a higher education Economics department.

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