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Group of National Experts on the AHELO Feasibility Study

ECONOMICS ASSESSMENT FRAMEWORK

AHELO Feasibility Study

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Economics Assessment Framework

January 2012



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INTRODUCTION

1. Within the United States advocates of large-scale general-education tests assert that individual students' general abilities to think critically, reason analytically, solve problems and communicate clearly can be assessed as the product of higher education. Accordingly, individual student scores can then be aggregated to the institutional level and compared to previous scores and other institutions to provide signals to the institution about its overall performance as a unit. In contrast, as seen in the European idea of TUNING, others assert that the essence of a higher education is discipline based, with each discipline having its own assessment needs based on desired student outcomes. To construct an assessment instrument within a field such as economics, therefore, requires that there first be consensus as to what constitutes the 'language of economics'. While economists may use a range of approaches and hold a number of standpoints, resulting in intense debates within the discipline, the first step in assessing economics learning outcomes is to identify a core language which enables them to communicate with each other.
2. The 2009 TUNING-AHELO Expert Group, representing economists from around the world, unanimously agreed that the language of economics could be seen in the work of the recipients of the Nobel Prize in the Science of Economics. In their approach to problems, issues, and events modern-day economists typically start with the identification of objectives to be achieved and a recognition of the constraints or resource restrictions that must be confronted in any attempt to achieve those objectives. Models of (or methods for connecting) objectives and constraints are then formulated, where the models identify relevant institutional details and might be static (ignoring time) or dynamic, with or without the incorporation of sources of uncertainty. Models might be based on or involve theoretical considerations, social norms, history of economic thought, or empirical inference, with reflections on shortcomings in the analysis based on mathematical limitations, data availability, or other impediments. Analysis might be aimed at explaining the allocation, distribution, and use of resources and their consequences for economic and social well-being at the individual or firm (micro) level or the aggregate (macro) level, recognising local, national, or international dependencies.
3. As seen in the curriculum of universities around the world, not only is there general agreement on what it means to be an economist, there is also agreement on the type of courses or subjects that are required to acquire the language of economics. For example, Yamaoka, Asano and Abe (2010) call attention to the fact that until the collapse of the Soviet Union in 1991, universities in Japan and Europe typically had Marxist economists in their faculties and offered courses in Marxist Economics but that is no longer the case. Today it is rare to see a required introductory or more advanced course in Marxist Economics. What is taught and learned in the microeconomic and macroeconomic introductory courses for the bachelor's degree tends to be relatively standard as seen in the numerous textbooks that differ only slightly from each other. At the intermediate

level differences in textbooks begin to appear but these differences are more a matter of emphasis within the models considered than in the approach to economic reasoning.¹

4. Even a cursory review of the four papers in the summer 2010 issue of the *Journal of Economic Education* that address the teaching of economics in Australia, Great Britain, Korea, and Japan shows that most universities have one or two introductory or principles courses that deal with microeconomic and macroeconomic ideas and concepts. For the bachelor's degree in economics, students must also complete intermediate level courses in microeconomic and macroeconomic theory. At least one course in statistics is required, and many institutions also require formal course work in econometrics or mathematical economics. A few also require a course in the history of economic thought or economic history in general. The number of elective (field) courses for the economics major varies from university to university.²
5. Although there is agreement on what the language of economics incorporates, it is the differences in model specifications, empirical support, emphasis on mathematical rigor and non-academic matters involving religious, political and personal beliefs that make the development and acceptance of a standard assessment instrument for the bachelor's degree in economics challenging. This was recognised by Hamish Coates (Ross, 2010) when quoted by journalist John Ross (2010) in the *Campus Review* saying that it was relatively easy to specify the capabilities needed by an engineer but such was not the case for an economist:

If someone can do those things, and do them in ways they can apply to professional practice, they're going to be a thriving professional engineer. In Economics, it's much more complicated. You've got different paradigms. Can we get consensus about what we need to measure, let alone any actual test? If we can test in those two divergent fields, it should be possible to do it in medicine, or math, or physics.

6. The different paradigms in conjunction with the difference in method of model development when done almost exclusively by words, graphs, or algebra add to the

¹ Historically, and as seen in the popular press, economists have been classified into schools of thought: classical economics, Marxist, Chicago school (freshwater), saltwater schools (MIT, Harvard, Berkeley), French heterodox, Austrian school, Keynesian economics, post-Keynesian economics, behavioural economics, etc. Today mainstream or orthodox economists (as opposed to their heterodox critics) do not fit into any one particular school of thought on the many topics in *The Journal of Economic Literature* classification codes. It is the nature of their models, empirical support and what is emphasized that distinguishes them from those who simply adhere to an ideology.

² For an example of the agreement on what courses are required for students to acquire the skill of an economist, consider the French government's response to the 2000 protest of students against: economics' "uncontrolled use" and treatment of mathematics as "an end in itself," with the result that economics becomes an "autistic science," lost in "imaginary worlds," lacking empirical and concrete content; the repressive domination of neoclassical theory and approaches derived from it; and the dogmatic teaching style in economics, which leaves no place for critical and reflective thought; a lack of pluralistic approaches adapted to the complexity of economic objects and to the uncertainty surrounding most of the big economic questions. (<http://www.autisme-economie.org/article155.html>). Pretty much ignoring these cries for heterodox reform, In 2007 the French government opened the Paris School of Economics (PSE) intended to be one of the top global institutions for economic studies to compete with the likes of Harvard, Chicago, MIT and the London School of Economics. In keeping with the teaching of economics at the best institutions around the world, "In the first year (M1) of the master's programmes, students take basic courses in microeconomics, macroeconomics, econometrics and economic history ... all courses are taught in English" (www.parisschoolofEconomics.eu/spip.php?rubrique4&lang=en).

complexity of producing a universally accepted testing instrument. Although it is relatively easy to guard against institutional and environmental misunderstandings (for example, the use of ‘scalper’ in talking about the sale of tickets outside a sporting event), language peculiarities are difficult to avoid (for example, even if a student in Russia has learned English, she or he might still have trouble with the distinction between the words price and cost, which are represented by one word in everyday Russian). Finally, there is the problem of having one instrument to serve for all institutions. For example, in The Netherlands (as found in other countries, as well) the tertiary system is binary with Higher Vocational Education (a type of Polytechnic and Fach Hochschule) and universities. Students’ expectations, motivations, and skills differ greatly between these two systems and it is difficult to see how one test could serve the needs of both.

7. While educational content and expected outcomes in economics are relatively consistent, a need remains to produce robust data on learning outcomes and graduates’ potential for subsequent success in work and further study. An assessment of economics capability undertaken as part of the AHELO Feasibility Study provides an opportunity to contribute to a more evidence-based approach to ascertaining quality in higher education. In collaboration with teams leading other modules, therefore, the work undertaken in the Economics strand of the AHELO study explores the feasibility of directly measuring learning outcomes in economics and across different cultural, linguistic, and institutional contexts.
8. With full recognition of the complications in assessing whether a student has acquired the knowledge and skills needed to master the language of economics, this Economics Assessment Framework sets out the guidelines for the development of a testing instrument for use in a variety of countries to assess the learning outcomes of students completing a bachelor’s degree or a first-cycle degree in economics.

FRAMEWORK SPECIFICATION

Overview

9. The issues faced by economists in today's world are increasingly global and complex and require economists to have both strong technical knowledge and skills, and understanding of relevant environmental, social, political, and cultural contexts. In addition, as for other professions, economists are expected to be good communicators, both to economic experts and non-economic experts, to be able to work effectively in interdisciplinary teams, to conduct themselves ethically and professionally, and to be able to constantly update and improve their technical and personal skills. These requirements are reflected in the 'learning outcomes' discussed below.
10. A cornerstone of any assessment framework is an agreed definition of the domain to be tested and on which instrument development can be based. The aim of this study is to measure whether tertiary economic students in the last year of their first-cycle or bachelor can apply their knowledge and skills to solving economics problems.
11. Arguably the most important aspect of assessing economic competency is the evaluation of how a student performs when measured against pre-defined objectives of achievement. These objectives are encapsulated in what are known as learning outcomes. For economics, five learning outcomes were identified by the Tuning-AHELO Expert Group and serve to circumscribe the economic knowledge and skills that are the focus of this study. These learning outcomes have been used explicitly in designing the Economics Assessment instrument.
12. The framework for the AHELO Economics strand is based on the following five learning outcomes, all of which specify outcomes which students should be able to achieve by the end of their bachelor's degrees:
 - I. demonstrate subject knowledge and understanding;
 - II. demonstrate subject knowledge and its application to real world problems;
 - III. demonstrate the ability to make effective use of relevant data and quantitative methods;
 - IV. demonstrate the ability to communicate to specialists and non-specialists; and
 - V. demonstrate the ability to acquire independent learning skills.

Objective

13. The Economics strand of the OECD feasibility study is intended to assess the learning outcomes of students completing a bachelor's degree or a first cycle degree in economics. Learning outcomes are statements of what a learner is expected to know, understand and be able to demonstrate after completion of a process of learning. This

framework describes and illustrates the domain of economic competency that is used in the AHELO Feasibility Study.

Context

14. In May 2009, the OECD brought together a group of academic experts with expertise in the teaching and learning of economics. These experts came from different countries and cultures, they spoke different languages, and they represented different academic and pedagogical traditions. This group reviewed how economics is taught and what is taught in various countries/universities and what research has been done in these areas. (The findings of this group are summarised in Tuning-AHELO Conceptual Framework of Expected and Desired Learning Outcome in Economics).³
15. The authors of the Tuning-AHELO paper concluded that a framework for economics should focus on identifying and describing the learning outcomes necessary for a first-cycle or bachelor's degree student to have achieved to be successful in a job or to be successful in pursuing a higher academic degree. The Tuning-AHELO Group also concluded that the QAA Subject Benchmark Statement for Economics 2007 from the United Kingdom could serve as a guide for developing the learning outcomes.
16. The Economics Assessment Framework which follows is based on the Tuning-AHELO paper as well as the QAA benchmarks. This document summarises the decisions of the AHELO Economics Experts Group, which held its first meeting in Paris from 29 to 31 October 2010 in preparation for the Economics strand of the OECD AHELO Feasibility Study to be conducted in 2011. In this Economics Assessment Framework the focus is on identifying the students' learning outcomes in economics, and not on specific teaching methods, course requirements for graduation, and the like. The framework was drafted by ETS, with input from Professor Rae Jean Braunmuller-Goodman from the United States Naval Academy, in September 2010, reviewed by the Economics Expert Group both before and during their meeting in October 2010 and also posted on the AHELO Exchange for feedback from participating countries. It was then updated based on feedback and finalised in April 2011.
17. The AHELO Economics Assessment does not focus on the recall of factual knowledge, but rather focuses on 'above content' skills including application of concepts, use of appropriate statistical and non-statistical tools, drawing conclusions, recommending policy, and being conversant with the language of economics. The first step in learning the language of economics involves knowing and understanding basic economic concepts which are listed as part of Learning Outcome I below and organised as key economic concepts (used in both microeconomics and macroeconomics), microeconomic concepts, and macroeconomic concepts. Learning Outcomes II-IV focus on the application of these concepts, the use of tools to evaluate issues, the use of data, and the ability to communicate results to various audiences.

³ www.oecd.org/dataoecd/46/33/43160495.pdf

MEASUREMENT OF ECONOMIC KNOWLEDGE

Learning Outcome I: Students should be able to demonstrate subject knowledge and understanding

18. Subject knowledge and understanding can be measured by asking students to demonstrate:
- consistent and coherent command of the language of economics, including the ability to clearly define standard terms and explain basic concepts in both microeconomics and in macroeconomics; with recognition given to controversies;
 - consistent and coherent command of the principles of economics, both microeconomics and macroeconomics, and the ability to structure economic arguments in a coherent and convincing way;
 - the ability to explain how economic agents (individuals, households, firms, governments, etc.) make decisions and make choices, and the ability to use this understanding to solve problems related to economic decisions;
 - the ability to explain the basic workings of an economic system and the role of policy in such a system; and
 - the ability to articulate critical features and shortcomings in an economic model or in a method of analysis.
19. While actual course requirements and content within specific courses vary widely across and within countries, some of the common concepts that are covered in this assessment are listed below.

A - Key economic concepts

- i. Opportunity cost: By asking and answering the question ‘*what is given up when one alternative is selected?*’, economists can think about the costs of an action in terms of all resources. An assessment of what is given up may involve a comparison of alternatives at different times. Present value calculations are used to compare alternatives with different cash outflows and inflows at different times to reflect the time value of money and other factors such as risk.
- ii. Incentives and expectations: People often react in predictable ways to incentives. Being able to predict how people will respond to incentives is critical in evaluating policies and strategies. The use of expectations in decision-making requires an understanding of probability and the notion that there can always be unexpected shocks or surprises. How agents form expectations and use expectations is debated in economics and forms the bases for alternative model formulations.
- iii. Equilibrium and disequilibrium: A stable equilibrium describes a state in which there is a tendency for prices and output to remain the same. Equilibrium does not always result in full employment or optimal allocation of resources. Disequilibrium indicates at least some economic agents have an incentive to change behaviour. The ability to identify disequilibria is important in policy-making.

- iv. Strategic thinking: This type of thinking involves the roles of opportunities, outcomes, information, and motivation in the analysis of actions, including conflict, bargaining and negotiation, and inter-temporal decision-making. Game theory techniques are sometimes used to model this behaviour.
- v. The relevance of marginal considerations: Decision-making sometimes involves the analysis of small variations in inputs for which small changes in outputs can be expected. Unfortunately, continuous incremental analysis is not always possible. However, when the additional benefit of an action is greater than the additional cost, the action should be taken.
- vi. The possible gains from voluntary exchange: Voluntary exchange takes place when parties expect to gain from that trade. The identification and measurement of gains relative to costs and the barriers to maximizing net gains are important in devising appropriate policies to optimize the use of scarce resources.
- vii. Systems and dynamics: Many economic decisions or events can start a complex chain of reactions. The ability to see beyond the direct or short-term effects of a decision can contribute to analysing the effects of both deliberate decisions and external shocks.
- viii. Numeracy: Economic analysis requires the use of numbers, mathematical concepts and methods, logical thinking, and reasoning in order to evaluate issues and solve problems.

B - Microeconomic concepts

- i. Decision-making and choice: Economic agents are required to make choices because resources are scarce. Choices involve considerations of opportunity costs, marginal analysis, production trade-offs (production possibilities frontiers), relationships between goods (substitutes versus complements), elasticity, and substitution and income effects. Risk and uncertainty affect choices of economic agents.
- ii. Production and exchange of goods: In some economic systems decisions about what to produce and how to produce are determined by markets, and in other economic systems such decisions are made by government agents. Economic activity, including the production of goods and services, may also occur outside of markets. Some economic decisions may be made through cooperation and bargaining.
- iii. The interdependency of markets: Firms use scarce resources to produce goods and services for consumers, businesses, and governments. The demand for labour and other scarce resources is a derived demand and depends on the demand for the goods and services that those resources produce.
- iv. Prices and market structure: In economic systems that rely on markets, consumer demand, costs, and the interaction of firms within specific market structures, determine price and output. The structure of costs, the conditions for entry and exit, product differentiation, and government regulations affect market structure. Government regulations, taxes, and subsidies also affect prices and output.

- v. Market failures: Externalities, asymmetric information, moral hazard, adverse selection, the strategic behaviour of firms in imperfect markets, and public goods may lead to inefficiency or market failure. Market failure may lead to government intervention in markets. Differentials in power among firms and between firms and workers may also affect the allocation of resources.
- vi. Economic welfare: Welfare economics evaluates how alternative economic arrangements affect economic efficiency and income distribution. One basic concept used to evaluate alternative economic arrangements is Pareto optimality, but other criteria, including equity, equality, and the provision of a minimum standard of living are also important.

C - Macroeconomic concepts

- i. Employment and unemployment: Full utilisation of resources (land, labour, capital) yields maximum production of goods and services with fixed technologies, social norms, and market and government structures. The unemployment of resources in an economy reduces that country's output to below its potential production (gross domestic product, GDP) level. Market forces need not automatically eliminate unemployment. There are many different types of unemployment (e.g., frictional, structural, cyclical). There is also a discouraged-encouraged worker phenomenon associated with changes in reported unemployment.
- ii. National income: The value of a nation's production can be used to measure the nation's growth and make cross country comparisons. National income, also referred to as GDP, can be reported in real and nominal values.
- iii. International Trade and Finance: Trade occurs between nations and is based on comparative advantage and the gains from trade. The trade in goods and services, financial transactions, and capital inflows and outflows determine the exchange rate (the international value of a country's currency) and are summarized in the balance of payments. The balance of payments consists of the current account (trade in goods and services and financial transactions between countries), the capital account (inflows and outflows of capital), and financial transfers which occur if the current account and capital account do not sum to zero. Changes in the international value of a country's currency may impact a country's interest rate and other macroeconomic variables. Trade barriers, such as tariffs and quotas, will impact both international trade and the international value of a country's currency.
- iv. International linkages and economies: Internationalisation and globalisation are major economic trends leading to more trade and cooperation agreements and to greater economic integration among nations and within regions.
- v. Distribution of income: While real GDP can measure a country's total production and GDP per capita looks at the average income of people in a country, neither addresses income differences. A Lorenz curve can be used to describe the degree of income inequality in a country and across countries. Discussion of poverty income levels and the percentage of the population below the poverty line add to an understanding of the distribution of income and its effects.

- vi. Inflation: Decision makers who need to compare long-term costs and benefits to make decisions/recommendations can make better decisions if the price level is known and constant or if the change in the price level is known and constant. Unexpected price changes cause an unintended redistribution of income and lead to a misallocation of resources.
- vii. Economic Growth: Economic growth can be measured by changes in real GDP or real GDP per capita. As a country grows, its citizens are generally better off economically. Growth can be increased through increased resources, increased education and training of workers, and changes in government policy. There are exogenous and endogenous theories of the determinants of long-run growth.
- viii. Business cycles: Economic fluctuations do not occur in regular patterns, nor are they predictable. Changes in investment and employment decisions by producers can lead to changes in a country's total production. Reducing fluctuations in the business cycle can create a more stable economic environment.
- ix. Money, banking and finance: Money eliminates the need for barter and makes the purchase of goods and services more efficient. Business, government, and consumer purchases are often financed through loans. Changes in a country's money supply and/or money demand impact other economic variables, such as interest rates, investment, consumption, value of the domestic currency, etc. These, in turn, affect a nation's production level.
- x. Economic policy: Government, quasi-public, supranational, and international institutions formulate and implement policies that affect macroeconomic variables. Decisions of the central banks with respect to the money supply, and decisions of the government concerning taxation, spending, and regulation impact the decisions of other economic agents. These policies often have unintended, as well as intended, domestic and international consequences. Examination of normative and descriptive policies is included.

Learning Outcome II: Students should be able to demonstrate subject knowledge and its application to real world problems

- 20. Subject knowledge and its application can be measured by asking students to demonstrate:
 - effective application of economic reasoning and methods of analysis to specific topic areas (e.g. markets, public finance, environment, poverty, health, labour markets, international trade, economic development, etc.);
 - recognition of assumptions and their implications for analytical results and economic debates; and
 - use of economic reasoning to formulate and evaluate economic advice and policy in both the private and public sectors.
- 21. In demonstrating their mastery of subject knowledge and its application, students may be asked to use the economic concepts listed in Learning Outcome I in applying their

economic knowledge to evaluate economic questions, issues, and policies. In contrast to Learning Outcome I, this learning outcome and the remaining learning outcomes focus more on multiple steps, multiple principles, and/or more sophisticated methods of analysis to address an issue.

Learning Outcome III: Students should be able to demonstrate the ability to make effective use of relevant data and quantitative methods

22. The ability to make effective use of relevant data and quantitative methods can be measured by asking students to demonstrate significant knowledge of the sources of economic and social data, including an understanding of where and how to find such sources and the methods used to create or collect such data.

A - Knowledge and access to economic data

23. Economic analysis may require the use of quantitative and qualitative data from primary and secondary sources and of historical information. It is necessary to know and be able to access different sources of national and international data provided by government, private sectors, and international organisations. It is also necessary to understand how data are collected as well as their limitations because conclusions of data-based research depend on the accuracy of such data.

B - Methods for economic analysis

24. Economic analysis may be done through the study of economic history and of other forms of data. Processing of data in different ways is needed in order to obtain information, statistics, and indicators that can help understand economic reality and economic problems and make it possible to test hypotheses. The knowledge and application of descriptive statistics, probability, hypothesis testing, correlation, and multivariate analyses can be considered as essential tools for assessing the application and relevance of economic theory and, hence, to determine if the evidence does not contradict economic assumptions and relationships.

C - Interpretations and limitations of empirical economic analyses

25. The ability to interpret results of data analyses and to draw the appropriate conclusions are essential skills. Equally important is the ability to recognize the limitations of the analytical method and data used.

Learning Outcome IV: Students should be able to demonstrate the ability to communicate to specialists and non-specialists

26. The ability to communicate with specialists and non-specialists can be measured by asking students to demonstrate effective communication and explanation of economic arguments, both to those with disciplinary knowledge and to non-experts. Such communication should be both oral and written, and might involve the use of computer projection technology as well as the Internet.
27. Assessing students' ability to communicate to specialists and non-specialists requires the students to use several types of communication.

A - Sharing information, ideas, problems, and solutions

B - Using appropriate analytical tools, such as tables, charts, graphs, models, etc., to communicate with the audiences

C - Presenting quantitative information in usable ways

D - Summarizing data that cannot be readily absorbed raw

E - Explaining results to specialists and non-specialists

Learning Outcome V: Students should be able to demonstrate the ability to acquire independent learning skills

28. The ability to acquire independent learning skills can be measured by asking students to demonstrate:

- the ability to think reflectively and critically about a range of issues in economics, as demonstrated through expression of and understanding of the history of economic thought, the capacity and limitations of alternative approaches to modelling economic behaviour, or other means of analysing or studying economic problems;
- the ability to pose and carry out the investigation of a specific problem in economics. This would involve (1) the formulation of a topic for study, (2) knowledge of previous research and results of the topic, (3) knowledge and choice of suitable methods for its investigation, and (4) the ability to draw conclusions from the investigation. Such conclusions might include areas for further investigation; and
- information literacy (the ability to identify, find, acquire, understand, evaluate, and use information and data about a specific economic problem). Demonstration of information literacy would involve (1) determining the extent of information needed, (2) accessing information effectively and efficiently, (3) critically evaluating information and its sources, (4) integrating selected information into the learner's knowledge base, and (5) using information effectively to accomplish a specific purpose.

29. The assessment of these learning outcomes should require students to use the following four competencies:

A - Abstraction

30. From the study of economic principles and models, students should learn to see how one can (1) abstract the essential features of complex systems, and (2) provide a useable framework for assessment and evaluation of the effects of policy or other exogenous events. Through this, the typical student acquires proficiency in how to simplify models while still retaining relevance. This is an approach that the student can then apply in other contexts, thereby becoming a more effective problem-solver and decision-maker.

B - Analysis, deduction and induction

31. Economic reasoning is highly deductive, and logical analysis is applied to assumption-based models. However, inductive reasoning is also important. The development of such analytical skills enhances students' problem-solving and decision-making ability.

C - Quantification and design

32. Data and their effective organisation, presentation, and analysis are important in economics. The typical student has some familiarity with the principal sources of economic information and data relevant to industry, commerce, society, and government, and have had practice in the organisation and presentation of data. This skill is important at all stages in the decision-making process. It is a central and crucial skill for an economics graduate because an employer will reasonably expect an economics graduate to be able to structure, analyse, and explain information presented in some numerical form. The raw data are frequently presented as tables (or datasets with a tabular structure) and the processed data as a graph, an average, a correlation, and so on. Numerate, statistical, and computing skills are necessary to handle this sort of information.
33. Presentation skills are needed to communicate such quantitative information in usable ways and particularly, to give critical and coherent summary representations of data that cannot be readily absorbed raw. In addition to forming manipulative and presentation skills required to deal with statistical data, economists learn not to be misled by numbers. Economists question whether the numbers represent what they claim (e.g., unemployment, price indices), understand statistical significance (e.g., the margin of error in a poll or survey), and are aware of at least some of the difficulties in sampling a population. In addition, with some understanding of econometrics, they recognize that conclusions drawn from data might be ambiguous.

D - Framing

34. Through the study of economics, a student should learn how to decide what should be taken as given or fixed for the purposes of setting up and solving a problem, i.e., what the important parameters are in constraining the solution to the problem. Learning to think about how and why these parameters might change encourages a student to place the economic problem in its broader social and political context. This framing skill is important in determining the decision-maker's ability to implement the solutions to problems.
35. Economic principles apply not only to business and management, but also other social science fields such as government, history, psychology, sociology, geography, law, and anthropology. Economists depend on mathematical concepts and statistical analysis techniques to evaluate and solve problems. First-cycle or bachelor degree students should be able to use the economic way of thinking and other analytical tools to evaluate problems/issues covering a wide and diverse range.

ASSESSING ECONOMICS COMPETENCY

Structure of the Economics Assessment

36. The duration of the Economics Assessment is 90 minutes, including about 45-50 multiple choice (MC) items to be completed in 60 minutes, and constructed-response (CR) task(s) to be completed in 30 minutes. These are approximate times only and these sections are not timed separately.
37. The assessment includes a broad sample of items covering a range of difficulty that enable the strengths and weaknesses of populations and key subgroups to be determined with respect to the components of the economics competency.
38. Due to the nature of economics and the interdependency of content, it is not always possible to assess each component discussed in this document separately from other content. Every item, though, is drafted to measure primarily a component of economic knowledge and skill as specified earlier in this document. For example, such skills as abstraction and deduction, as described in Learning Objective V, are not assessed separately but in the context of economic problems or scenarios posed in MC items and CR tasks.
39. Items are designed to measure varying levels of proficiency. Less demanding items are designed to measure an understanding of economic principles (Learning Objective I). Higher levels of proficiency are measured by asking students to evaluate the effectiveness of a given policy change or to use an econometric model to predict an outcome (Learning Objectives II-V).
40. Language difficulty is set at or below an appropriate level for final-year first-cycle economics students. Charts, graphs, tables, and econometric models are used, as appropriate.
41. Care is taken to ensure that a range of contexts is employed as one means of controlling for students' interest and prior knowledge. The Economics Experts Group helped ensure that all scenarios are applicable to all countries and cultures. Real world situations are often extremely complex and involve a number of variables changing simultaneously, requiring a balance between authenticity of context and practicality of assessment when constructing items.
42. Economic principles are often divided into two major components: macroeconomics and microeconomics. While equal emphasis on these two components is not necessary, great care must be taken in balancing the items such that one is not emphasized at the expense of the other.

43. Item response formats include:
 - multiple-choice: simple and complex items that are answered by selecting one option from a list of four choices;
 - short constructed-response tasks: items that require the respondent to provide his or her own answer to a series of related questions (completed in 8-10 minutes); and
 - long constructed-response tasks: items that require the respondent to provide his or her own answer to a series of related questions (completed in 20-30 minutes) and incorporate multiple learning objectives.
44. In this assessment, MC items provide a fast and efficient way to collect data on students' economic knowledge, understanding, and skills.
45. Short and long CR tasks require students to do more than select the best answer from a variety of options. Rather, students are given a problem and asked to solve the problem, recommend policy, provide explanations, and so on. The distinction between short and long responses largely depends on the complexity of the problem and the time needed to respond to all parts of the task. Examples of the type of items which might be found in a CR task are given in Annex B.
46. Marking guides or scoring rubrics for evaluating student responses to items are constructed based on the components of economics competency identified in the Measurement section of this document. The scoring rubric specifies the points allocated for each part of the task.
47. In the rubrics, the highest level of scoring reflects a complete understanding of the problem, be tied to a correct solution, reward thought that shows considerable insight, and reflect work that is clear, appropriate, and fully developed. Such responses should be logically sound, clearly written, and contain no errors. Example responses are well chosen and fully developed.
48. At a slightly lower score level, one might encounter work that demonstrates an understanding of the problem, shows some insight, and provides an acceptable approach, but answers to some parts of the task may be incorrect or not fully developed, or an explanation may be weak.
49. At an even lower level, one may see work that presents an understanding of the problem at the conceptual level evidenced by the logical approach to complete the task, but major parts of the expected response are missing and/or incorrect. Typically, the response may lack an acceptable explanation or understanding of a graphical or statistical result.
50. Finally, there is no credit for a completely incorrect or irrelevant response. Within the scoring at this level, allowance is made for distinguishing between students who attempt a given problem and those who submit a blank response. The latter may signal either lack of time or a motivational problem.
51. The assessment of Learning Objectives I and II focuses on the concepts listed in Learning Objective I. The full assessment includes coverage of all concepts; however, due to the more limited time and number of MC items included, not all concepts are covered. As many concepts are covered as allowed by the items approved by the committee for use in the feasibility study, CR tasks incorporate at least three learning

objectives and may incorporate all five learning objectives. Concepts covered in Learning Objective I and II are certain to be included in any CR task. Learning Objectives III, IV, and/or V are also covered in any CR task; the learning objective covered depends on the focus of the task. The CR tasks typically incorporate a student demonstrating an understanding of some concept (Learning Outcome I) and some application of the concept (Learning Outcome II). In addition the student may be asked to use appropriate data and quantitative methods (Learning Outcome III). Learning Outcome IV (ability to communicate) is also assessed in a CR task. The ability to acquire independent learning skills may not be included in any CR task.

52. Not all components of the five learning objectives are assessed in the MC section of the Economics Assessment, in part due to the time and technical constraints surrounding the AHELO Feasibility Study. For example, communicating with experts and non-experts is not assessed in the MC section nor is acquiring independent learning skills. Such learning objectives are more applicable to CR tasks rather than MC items.
53. Table 1 summarises the approximate percentage of MC items covering each of the Learning Outcomes specified in this Economics Assessment Framework.

Table 1: Distribution of multiple choice items in the Economics Assessment

	Learning Outcome				
	I	II	III	IV	V
MC (%)	15-20	60-70	15-20	0-5	0-5

Functionality provided by computer delivery

1. The Economics Assessment will be administered via computer. Doing so has several benefits, as outlined in the next few paragraphs.
2. It is possible to deliver items in a fixed order, or ‘lockstep’ fashion if desired. The lockstep procedure means that students are not able to return to an item or unit once they have moved to the next one. Each time students click the ‘Next’ button a dialog box displays a warning that they are about to move on to the next item and that it is not possible to return to the previous item. At this point, students can either confirm they want to move on or cancel the action and return to the current item. The lockstep procedure may be more appropriate for different sections of the Economics Assessment. For example, it may be appropriate for the multiple-choice items, but not for the constructed-response tasks.
3. An advantage of the lockstep approach is that it maximises the independence of items within and across units, since students cannot find clues in later tasks that might help them to answer earlier ones. Put more positively, later items can reveal the answers to earlier items without enabling previous answers to be changed.
4. While not possible in the AHELO Feasibility Study, a broader benefit of measuring economics competency by computer is that, dynamic stimulus material can be produced, including: visuals such as video clips and animations; environments where students interact with features to explore or control a situation; simulations where students can

enter parameters and run models; and on-line tools for performing calculations and searches, and for drawing graphs and diagrams.

5. A further benefit is the opportunity to capture and measure data that relate to processes and strategies. It is possible to record data such as the type, frequency, length and sequence of actions performed by students.
6. Another benefit is that the time students spend on any particular item can be restricted, where it is considered appropriate. This is particularly useful in contexts where students are exploring stimulus material interactively.
7. Any responses that cannot be scored automatically are collected by the computer-delivery system and saved in an appropriate format. An online scoring system facilitates scoring (by experts) of these saved files. This eliminates the need for separate data entry, minimises the need for data cleaning, and allows scoring to take place 'off site' if desired.
8. While economics graduates are expected to be familiar with various software packages, detailed knowledge of particular software is not assumed in the assessment. Only basic ICT skills are assumed, such as keyboard use, manipulating a pointer (via a mouse), clicking option buttons, drag-and-drop, scrolling and use of pull-down menus and hyperlinks.

Calculators

54. This assessment does not focus on students' ability to perform calculations. The items have been constructed so that students do not require a calculator to respond. Given that many calculators have similar functionality to computers, and that their use could make answering some items easier, their use is prohibited at this stage of the Economics Assessment. Should the assessment be administered in the future via computer to benefit from such a delivery mode, then calculator use will be reviewed by the committee.

Reporting Economics competency

55. Similar to the PISA reporting practice (OECD, 2009b), results are reported on a scale constructed using a generalised form of the Rasch model. Underlying the construction of a scale are several assumptions: that there is a latent trait (as specified in the assessment framework) that can be represented by a continuous variable and is possessed by test takers; that test items can be constructed that require the test taker to use this trait in responding to items; and that the amount of the trait possessed by test takers is a function of the score they receive on the test.
56. The form of the Rasch model that is used employs the scores obtained by students to produce estimates for both the difficulty of items and the ability of students on a single real-valued scale. The scale is constructed so as to have a mean score of 500 and standard deviation of 100; accordingly, about two-thirds of the test takers would score between 400 and 600 points.
57. The scale is divided into levels (bands) of equal width, with an unbounded region at each end of the scale. Each band corresponds to a student proficiency level (or, alternatively,

an item difficulty level). Information about the items at each level is then used to develop descriptions characterising typical student performance at each level. The specific constituent learning outcomes of the competency components is very useful as the basis of these descriptors.

58. Five levels of proficiency are able to be identified and described to show individual economic competency. The model and scaling methods allow the linking of measures of student performance with data collected in the context instrument, such as gender, socioeconomic standing, geographical location, and institution attended. This enables statistical comparisons of population means among students grouped by these background factors. For example, comparisons of performance among participating institutions will be possible.
59. In assessments with a large enough number of items responded to, it is sometimes possible to collect sufficient data to create subscales (e.g., macroeconomics, microeconomics) based on independent components within a domain. It is unlikely that there will be enough such items to report on potential economics subscales.
60. Item difficulty depends on a number of variables, including:
 - context, including familiarity and concreteness of context;
 - complexity of problem;
 - number of constraints present;
 - amount/coherence of information; and
 - number of steps in reaching an answer.

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ANNEX A: ECONOMICS EXPERT GROUP

The AHELO Feasibility Study's Economics Expert Group (EEG) was drawn from participating countries and key international organisations. The EEG has supported the development of the Economics Assessment Framework and Economics Assessment. The work of the EEG builds on that of the Tuning-AHELO Expert Group (TAEG). Table 2 lists members of these groups, affiliations, and periods of service.

Table 2: Economics Expert Group membership

Expert Group Member	Group	Affiliation	Service
Professor Filip Abraham	TAEG	K.U. Leuven, Belgium	2008-09
Professor William Becker	TAEG, EEG	Indiana University, United States	2008-11
Professor John Beath	TAEG, Chair	University of St. Andrews, United Kingdom	2008-09
Professor Cecilia Conrad	TAEG, EEG, Chair	Pomona College, United States	2008-12
Professor Maria de Lourdes Dieck-Assad	EEG	Monterrey Institute of Technology and Higher Education, Mexico	2010-12
Professor Mark Freeman	TAEG	University of Sydney, Australia	2008-09
Professor Elvio Accinelli Gamba	TAEG	Universidad Autónoma de San Luis Potosí, Mexico	2008-09
Prof. W. Groot	TAEG	University Maastricht, The Netherlands	2008-09
Professor Julius Horvath	TAEG	Central European University, Hungary	2008-09
Professor Fiorella Kostoris	TAEG, EEG	Università di Roma, Italy	2008-12
Professor S. Madheswaran	TAEG	Centre for Economic Studies and Policy, India	2008-09
Professor Tatsuya Sakamoto	TAEG, EEG	Keio University, Japan	2008-11
Professor Friedrich Schneider	TAEG	University of Linz, Austria	2008-09
Professor Henriette Maassen van den Brink	TAEG, EEG	Amsterdam School of Economics, Netherlands	2008-2012
Professor Vladimir Zuev	TAEG, EEG	State University, Higher School of Economics, Russia	2008-2012