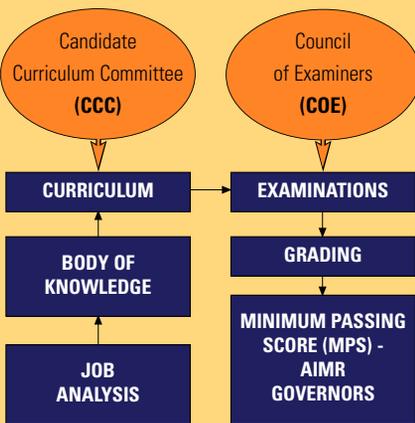




ity of professional credentialing examinations should be demonstrated primarily by verifying that the content of the examination (and relevant weighting of content areas) accurately represents professional practice. Furthermore, the *Standards* state that a job analysis study — a compilation and confirmation of the knowledge and skills required for competent professional practice — is the basis for establishing the content validity of credentialing examinations. Testing experts have described the CFA Program’s job analysis as a “text-book” process.



**Practitioners at every step of the process**

The AIMR Board first commissioned a job analysis in 1995. Prior to 1995, committees of charterholders developed the Candidate Body of Knowledge. In 2000, the Board commissioned Knapp & Associates International to assist professional staff in conducting a second job analysis to:

- delineate responsibilities and knowledge associated with the role of the CFA charterholder;
- identify changes to professional practice since the job analysis of 1995; and
- identify similarities in professional practice and the role of the CFA charterholder across national boundaries.

The job analysis involved a process that combined the:

- expertise of Knapp & Associates staff;
- professional knowledge of expert independent panels, committees comprised

of prominent practitioners and AIMR professional staff; and

- judgments of a large, global sample of CFA charterholders.

A series of panels and committees, consisting of prominent investment practitioners, created an inventory of critical responsibility and knowledge dimensions that was subsequently converted to a survey and mailed to a representative global sample of charterholders. Panels of CFA charterholders around the world were selected to represent the diversity in the profession with respect to geography, work setting, and professional role.

In addition to the random sample, the September/October 2000 issue of *AIMR Exchange* contained an open invitation for charterholders to participate in the job analysis survey. A total of 16,103 surveys were mailed and, based on a healthy 23 percent response rate, the results confirmed the work of the panels and committees in identifying the most critical knowledge areas for investment professionals. This job analysis guided development of the CFA curriculum and refined the Level I, II, and III examination specifications.

Following review of the job analysis, the Curriculum and Test Specifications Committee (a group of senior-level charterholders with extensive experience in CFA Program activities) developed specifications for the CFA examinations. The linkage of the examination specifications to the findings of the job analysis serves as evidence of the content validity of future examinations, outlining the:

- specific knowledge areas that the CFA examinations should assess and the relative weighting of each area;
- cognitive level (familiarity, proficiency) at which the exams should assess the knowledge; and
- frequency with which the exams should test each knowledge area (i.e., virtually annually, less than annually).

Importantly, all participants in the job analysis, from panel participants to survey partici-

pants and members of the Curriculum and Test Specifications Committee, were practicing charterholders.

## Candidate Body of Knowledge and Topic Area Weights

A major outcome of the job analysis is an updated CBOK. The CBOK is the scope of knowledge needed for basic competence in investment management, with “basic competence” defined as the baseline level of knowledge and skills required to perform professional responsibilities in an effective and ethical manner. The CBOK is a subset of the Global Body of Knowledge™ (GBOK™), the compilation of mainstream knowledge for the profession, encompassing an entire career — novice through expert — for both generalists and specialists. Topics in the GBOK that are not in the CBOK are ideal subjects for continuing education.

The CBOK has been gradually broadened from the common body of knowledge for the first CFA examination, which focused on: 1) investment goals, investment timing, and portfolio balance; 2) institutional investing; 3) ethical issues; and 4) review of securities regulations.

Over time, entire topic areas, such as the valuation of debt, derivatives, and alternative investments, were added to keep pace with the changing profession. And, because the CFA Program is global in scope, and laws and regulations differ regionally, the CBOK no longer includes specific securities regulations.

Although all CBOK topic areas relate directly to competence in investment management, they do not all have the same degree of impact on professional practice. Some areas may be of greater importance or may be utilized more frequently than others in day-to-day responsibilities. Consequently, weights are assigned to each topic area to indicate relative emphasis within the CBOK. These weights, in turn, guide the selection of the curriculum and the development of the examinations.

## COMPARISON OF CBOK WITH GBOK



Although all CBOK topic areas relate directly to competence in investment management, they do not all have the same degree of impact on professional practice. Some areas may be of greater importance or may be utilized more frequently than others in day-to-day responsibilities. Consequently, weights are assigned to each topic area to indicate relative emphasis within the CBOK. These weights, in turn, guide the selection of the curriculum and the development of the examinations.

When determining which topic area weights to assign for each of the examinations, the Curriculum and Test Specifications Committee first considered the survey respondents' recommendations about content coverage. Respondents specified, for all three examinations combined, the percentage of content to devote to each of ten topic areas. The committee reviewed the current topic weights and the AIMR Board's mandate with respect to the weighting of the Ethical and Professional Standards area. Lastly, it considered the focus of each of the examination levels [see table on page 4].

## CANDIDATE BODY OF KNOWLEDGE

### ETHICAL & PROFESSIONAL STANDARDS

#### TOOLS

- Quantitative Methods
- Economics
- Financial Statement Analysis
- Corporate Finance

#### ASSET VALUATION

- Analysis of Equity Investments
- Analysis of Debt Investments
- Analysis of Derivatives
- Analysis of Alternative Investments

### PORTFOLIO MANAGEMENT

**The current CBOK is organized into four general areas: ethical and professional standards, tools and inputs for investment valuation and management, asset valuation, and portfolio management.**

#### The Curriculum Process

The CFA examinations receive much attention, but the curriculum provides the foundation for the exams. The curriculum topics are those CBOK elements identified in the job analysis. The curriculum constitutes the study material on which the examination questions are based. The curriculum, in turn, is based on and reflects the CBOK.

The purpose of the curriculum is to increase candidate learning, recognizing the constraints inherent in a generalist,

self-study program designed for working professionals. The purpose of the Candidate Curriculum Committee, therefore, is to select curricular materials that provide a learning bridge between the CBOK and the examinations. Over 150 practicing charterholders from throughout the world participate in the annual curricular process.

CCC members recognize the CFA Program as fundamentally different from academic programs. One of the functions of the CCC is to select readings for the CFA curriculum, which AIMR outlines annually in CFA Program study guides. The curriculum traditionally has been based upon textbooks, professional journal articles, commissioned readings, cases, and research analysts' reports, but it is more than a reading list. In 1996, AIMR significantly changed the design of the curriculum by adding learning outcome statements (LOS) at Level III, which it then incorporated at Levels I and II the following year.

Many involved in the curriculum process believe that reading-specific LOS — a common feature throughout education — are the most significant curriculum innovation since the inception of the program. The purpose of LOS is to enhance candidate learning while guiding examination writers, the COE, as to what examination questions the curriculum material will support. The LOS link the CBOK to the curriculum and thus to the examinations, helping candidates prepare for the exacting standards of the investment profession. Finally, LOS shape candidate expectations.

The curriculum contains both topic-level and reading-specific LOS. Each LOS contains the words, "The candidate should be able to ..." The committee writes examination questions and guideline answers within the bounds of the LOS, often integrating more than one LOS in a question. The COE views the LOS as a contract with the candidates. If candidates can do what the LOS indicate, they should be successful on the examinations. It is the job of the CCC to ensure that the readings enable the candidates to achieve each LOS.

In contrast to LOS on individual readings, topic-level learning objectives

give an overview of the material and indicate the depth of knowledge expected. Topic-level statements are broad, describing outcomes in terms of the learning expected at that level of the examinations. The following represents the Level II topic-level LOS for the analysis of equity investments:

**"The candidate should be able to apply fundamental analysis to investment valuations, analyze special situations (e.g., corporate restructurings, mergers and acquisitions, closely held companies, and distressed securities), and use various equity valuation models to estimate risk and return."**

While helpful as guides, topic-level LOS are not detailed enough to direct the candidate's study. Reading-specific LOS help candidates understand the knowledge they must gain from each reading. The COE also uses reading-specific LOS to determine the nature of the questions on the exam and to frame the grading key. Command words (such as calculate, describe, and analyze) common to the curriculum and examinations link the LOS to the examinations. Thus, reading-specific LOS are a critical component of the CFA Program.

The following is an example of the Level II reading-specific LOS and associated command words from the "Company Performance and Measures of Value Added" reading by Peterson and Peterson (AIMR, 1997):

The candidate should be able to:

- **calculate** the traditional measures of performance;
- **analyze** the advantages and disadvantages of using return on investment ratios and Tobin's Q as measures of company performance;
- **distinguish** between economic profit and accounting profit, and relate economic profit to net present value;
- **calculate** economic value added (EVA) and market value added (MVA);
- **describe** the process for determining cash flow return on investment (CFROI);

*continued*

- **demonstrate** the link between EVA and MVA;
- **explain** the differences among EVA, MVA, and CFROI;
- **compare** the empirical relationships between stock returns and value-added measures with the empirical relationship between stock returns and more traditional valuation measures.

A CCC Executive Advisory Board (CCCEAB) leads the curriculum process. This group consists of four prominent CFA charterholders who examine the curriculum in its entirety. This group directs the curricular process and ensures the overall curriculum is consistent with and reflective of current practice. This group works with AIMR staff to select the project managers and topic area coordinators described below.

Project managers oversee a specific level of the CFA Program, viewing study guides the same way candidates do, by level. This perspective ensures consistency of coverage across the topics. Project managers give particular attention to the focus of each level, in cognitive learning (knowledge/comprehension at Level I; analysis/application at Level II; synthesis/ evaluation at Level III) and in functional areas (tools, inputs, and professional standards at Level I; security valuation and professional standards at Level II; and portfolio management and professional standards at Level III). Project managers prepare a “gaps and overlaps” report,

mapping the current curriculum to the CBOK. Both the CCCEAB and topic area coordinators use this as the basis for curricular revisions.

Topic area coordinators oversee each of ten topics across the curriculum. Where appropriate, the progressivity of the topic across the three levels is the responsibility of a topic area coordinator. These coordinators give particular attention to continuity of assignments over the three levels, eliminate significant subject area gaps and duplication across the three levels, and ensure that readings are appropriate for each level (Level I emphasizing tools, Level II emphasizing valuation, and Level III focusing on portfolio management).

The critical role of reviewing the curriculum for accuracy, pertinence, and appropriateness is the responsibility of the CCC Working Body (CCCWB). The CCCWB is a group of charterholders that reviews the proposed curriculum and provides feedback to project managers and topic area coordinators. The CCCWB evaluates proposed Study Sessions (with LOS) to ensure the curriculum is consistent with current practice. This group is also encouraged, but not required, to recommend alternative readings for consideration. This group varies in size, and is currently composed of nearly 150 charterholders throughout the world.

CCCWB members are familiar with the concepts of distance learning, recog-

*Project managers oversee a specific level of the CFA Program ... this perspective ensures consistency of coverage across the topics.*

nizing it as different from classroom learning. They have dual responsibilities: to review one or more study sessions within their areas of expertise and to review one or more study sessions outside of their areas of expertise. Because the CFA Program is broad-based and designed for the generalist, the curriculum must be appropriate for the generalist. Another duty of the CCCWB is to examine potential curricular materials from the viewpoint of candidates by reviewing materials outside their areas of expertise, paying particular attention to clarity of exposition (from a generalist’s perspective).

Although much of the curriculum is drawn from existing sources, the CCC maintains the tradition of the CFA Program in developing curricular sources when existing material is inadequate. For many years, the CCC has recognized disadvantages to using many “off-the-shelf” products. For instance, college texts are often overly academic and “country-centric,” while practitioner texts are rare and often cannot be understood by a generalist. Journal articles often presume more knowledge than is required of a generalist. But, perhaps the greatest weakness in off-the-shelf products is that they often contain material outside of the CBOK.

When developing curricular products, the CCC requires material to meet certain criteria. The material must be:

- tailored specifically to CFA candidate needs;
- limited to the items contained in the CBOK;

## TOPIC AREA WEIGHTS FOR CFA EXAMINATIONS (IN PERCENT)

Topic area	Level I	Level II	Level III
Ethical and Professional Standards	15	10	10
Quantitative Methods	12	5	5
Economics	10	5	0
Financial Statement Analysis	20	20	0
Corporate Finance	8	10	0
Analysis of Equity Investments	10	25	10
Analysis of Fixed Income Investments	10	10	15
Derivatives	5	5	10
Alternative Investments	5	0	5
Portfolio Management	5	10	45
Total	100	100	100

- relevant for practice worldwide;
- replete with examples and practice problems both within and at the end of chapters;
- conceptually correct and totally relevant;
- readable;
- cost effective;
- pedagogically sound in a self-study framework.

Curricular development is not a recent phenomenon at AIMR. In *The Making of the Profession: The History of the CFA Program*, Dr. Sheppard notes the “marked paucity in 1965 of relevant study guide materials,” and states, “Gone were the days when reliance could be placed on general textbooks and selected articles.” This resulted in the ICFA working closely with several entities to customize materials for the CFA Program.

A cornerstone of the CFA curriculum for 17 years has been the book *Managing Investment Portfolios*, edited by John Maginn, CFA, and Don Tuttle, CFA, commissioned in the 1980s when CCC members determined existing materials were inadequate. The 2001 curriculum introduced *Fixed Income Analysis for the Chartered Financial Analyst Program* and *Fixed Income Readings for the Chartered Financial Analyst Program*, each authored by Frank Fabozzi, CFA. In addition, several AIMR-produced continuing education pieces and Research Foundation monographs appeared in the curriculum over time.

A distinguishing feature of AIMR’s curriculum development is the extensive review process to which all products are subject. Practicing charterholders review each chapter or article to ensure it is conceptually correct and relevant. Practitioners from all over the world participate in this process. In reference to the aforementioned texts, Dr. Fabozzi said: “Of all the books I have authored (more than 100), these books have been the hardest to write ... the reviewers made me an almost paranoid writer, as every word and statement was scrutinized to make sure it would be clearly understood by the CFA candidate.”

*Quantitative Methods for Investment Analysis* was published last year under the direction of AIMR Vice President Dennis McLeavey, CFA. *Analysis of Equity Investments: Valuation* published in August 2002 will be the focus of the 2003 Level II equity analysis curriculum. Currently, the CCC is involved with several curricular development projects. Several prominent investment professionals now are involved with a complete revision of *Managing Investment Portfolios*, which should be ready for the 2005 examinations.

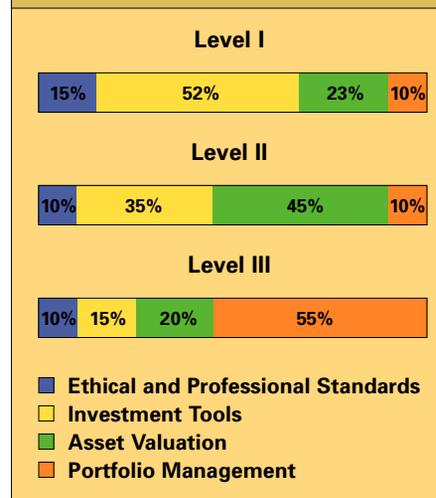
The fact that many academic institutions have designed degree programs around the CFA Program, have adopted CFA Program curricular materials, or have embedded the entire CFA curriculum into their programs is a testament to the quality of the CFA curriculum. Prominent academic institutions such as Hong Kong University of Science & Technology, Boston University, Singapore Management University, Simon Fraser University, and the University of Richmond have embedded all or part of the CFA curriculum into their own curriculums.



### EXAM DEVELOPMENT

**W**hen the first CFA charters were awarded in 1963, candidates had to successfully complete a single four-and-a-half-hour examination to earn the charter. The examinations were given in two separate, two-hour-and-fifteen-minute sections. In 1964, all three levels of

FIGURE 1  
TOPIC AREA COVERAGE FOR THE  
2002 CFA EXAMINATIONS



the examination were administered to 1,732 candidates in the United States and Canada. In 1968, the exam consisted of two sections for a total of five hours and fifteen minutes. The year 1981 marked the first time that the examinations were a total of six hours in length. AIMR has retained the current format of two separate, three-hour sections since that time.

### Exam Content

The CFA examinations have always been centered on testing investment tools at Level I, asset valuation (security analysis) at Level II, and portfolio management at Level III. This structure is the logical progression of the investment process: a practitioner needs to master investment tools to apply those tools to security valuation, and securities need to be valued and then analyzed in a risk/return portfolio context. Since integrity should be exercised throughout the investment process, AIMR has emphasized ethical and professional standards at each level. The 2002 examination topic weights are provided in Figure 1.

A commitment to excellence in the development of the CFA examinations has been the hallmark of the development process. The Council of Examiners (COE) writes the examinations with professional

*continued*

staff assistance. In 1963, the original COE consisted of four academicians and the president of the Montreal Stock Exchange. Today, the COE consists of more than 30 CFA charterholders, both practitioners and academicians. In addition, an equal number of charterholders are involved in the review process. All individuals involved in the process are CFA charterholders in good standing.

The COE cycle starts more than a year in advance of the examinations, when the COE leadership meets to set the parameters for the next year's examinations. These guidelines are disseminated to COE members who begin crafting their proposed questions prior to the first meetings in the exam development cycle. To be included on the CFA examination, a question must relate directly to one or more learning outcome statements (LOS) written by the Candidate Curriculum Committee (CCC). No question appears on the examination if it is not supported by an LOS.

The COE essay team is structured along exam *level* lines, and members write a certain number of minutes of questions in their areas of expertise. The COE item set team is structured along *topic* lines, and members write a certain number of item sets in their assigned topic(s). The COE leadership and membership review the entire draft examinations several times. Questions appearing on the 2002 Level II and III CFA examinations were formally reviewed at least 10 times, and the equivalent of nearly 150 person days was devoted to those reviews. In addition, COE members write more questions than will be utilized on the examination so that the COE leadership can select the best questions for inclusion on the examination.

All COE members and AIMR professional staff have benefited from working with psychometricians, who are experts in the disciplines of testing and measurement. COE members pay careful attention to question construction. Additionally, because the CFA Program is global in scope, the question writers pay particular attention to language usage and grammar. Once the exam is in nearly final draft form, AIMR professional staff conducts review

## SAMPLE MULTIPLE-CHOICE QUESTION

**An analyst gathered the following information about a company whose fiscal year end is 31 December:**

- **Net income for 2001 was \$10.5 million.**
- **Preferred stock dividends of \$2 million were paid in 2001.**
- **Common stock dividends of \$3.5 million were paid in 2001.**
- **20 million shares of common stock were outstanding on 1 January 2001.**
- **The company issued 6 million new shares of common stock on 1 April 2001.**
- **The capital structure does not include any potentially dilutive convertible securities, options, warrants or other contingent securities.**

The company's basic earnings per share for 2001 was *closest* to:

- a. \$0.35
- b. \$0.37
- c. \$0.43
- d. \$0.46

sessions in which they ask charterholders from Asia, Europe, and North America to make suggestions to ensure that the language is country neutral. Input received in these sessions is delivered to the question writers; they then have the opportunity to revise the examination questions.

### Level I Exam

The current format of the Level I examination is 100 percent multiple choice [see sample multiple-choice question above]. There is a long history of multiple-choice questions appearing on the CFA examinations, dating back to 1970 when 25 multiple-choice questions first appeared at Level I. By 1986, 50 percent of the Level I examination was multiple choice and the first all multiple-choice Level I examination appeared in 1996.

AIMR professional staff working with outside experts produce the Level I exam. In addition, a group of senior CFA charterholders who are investment practitioners and academicians carefully review all examination questions. Level I multiple-choice questions are crafted with each of the incorrect responses (distractors) carefully constructed to represent common mistakes in either calculations or logic when answering the question. A Level I exam consists of 240 questions in a six-hour time frame.

AIMR does not produce a Level I examination from an existing test bank of questions. Rather, a new Level I examination is produced for each annual examination. Although some questions may be versions of questions that have appeared on earlier examinations, each question appearing on an examination goes through an extensive review process every year. For the 2002 exam, the equivalent of 80 person days was spent reviewing Level I exam questions. AIMR does not publicly release the Level I examination; however, to orient candidates to the style and format of the questions, AIMR provides a sample examination.

To ensure quality control, each year candidates are invited to identify any questions they believe were either incorrect or may have had more than one correct answer. Members of the examination development team investigate these inquiries to determine if any questions need to be discarded or if more than one response needs to be awarded credit. Over the past three years, no questions have been eliminated nor have any questions had more than one correct answer.

It is a common misconception in testing that multiple-choice questions are easier than their essay and short-answer counterparts. Empirical results from the CFA Program indicate that raw scores have not risen as the percentage of multiple-choice questions has increased. Additionally, testing research and "best practice" indicate that the format of the examination has little impact on the difficulty of the examination. What does affect difficulty, however, are the subject matter and the actual construction of the questions. Nearly all licensing and credentialing examina-

tions with a large candidate population are conducted in the multiple-choice format.

### Level II and III Exams

The current Level II and III examinations consist of 50 percent essays and problems and 50 percent item set questions. The AIMR Board of Governors first directed the COE to utilize the item set format on the ethics portion of the 2000 Level II and III examinations. The following year, the Board directed the COE to utilize the item set format for 50 percent of the Level II and III examinations.

#### Item Sets

An item set is a vignette or short case situation followed by several (six in the case of the CFA Program) multiple-choice questions based on the vignette [see sample item set, page 8]. Item sets are being increasingly used by professional testing programs, including the uniform CPA examination, various medical licensing and associated examinations, the Law School Admission Test (LSAT), the Graduate Record Examination (GRE), multi-state bar examinations, and the Graduate Management Admissions Test.

Testing research has shown that multiple-choice items and exams typically have greater validity, reliability, efficiency, and cost-effectiveness than essays. Simply stated, an assessment of validity indicates that an exam is measuring what it intends to measure; reliability provides an indication of the accuracy of that measurement; efficiency refers to the breadth and depth of topic coverage; and cost-effectiveness refers to the economics of constructing and grading the examination. The AIMR Board considered these factors before making the determination to move to the item set testing format.

AIMR has been criticized by CFA charterholders who believe that introducing the item set format into Levels II and III has devalued the designation. The prevailing sentiment from candidates is that the item set portions of recent Level II and III examinations were more difficult than the essay portions of the examinations. Candidate performance statistics, at least in terms of raw scores, are consistent with this contention.

It is true that candidates have a 25 percent chance to guess the correct answer to a four response multiple-choice question. However, it is also true that there is no opportunity for partial credit on multiple-choice questions used in an item set format while there *is* that opportunity with essay questions. Thus, candidates either earn full credit for each correct response or no credit for an incorrect response. This leads to a higher discrimination index (effectively distinguishing between candidates who have mastered the material and those who have not).

#### Essays

The essay portions of the Level II and III examinations are characterized by questions of varying structure and point values. Each question begins with a command word that corresponds to the command words contained in the LOS written by the CCC. As with item set and multiple-choice questions, no essay question appears on any CFA examination that is not explicitly tied to one or more LOS. COE members are responsible not only for writing examination questions, but also for writing guideline answers, grading keys, and other supporting documentation for those questions.

Essay examination questions have changed significantly in nature over the history of the CFA examination. In the early years of the examination, large point value, open-ended questions were very common. For instance, the 1965 Level III examination contained the following 25-minute question:

**“The value of a common stock or any other security is what you can sell it for.”**

**Analyze the above statement and explain fully how you would arrive at the value of a common stock.**

Today’s CFA examination questions are much less open-ended and of much smaller point values in order to cover more of the assigned curriculum. An example of such a question — taken from the 2001 Level III examination and based on a fairly long preamble — is featured above.

### SAMPLE ESSAY QUESTION

**A. Formulate** the following elements of Stephenson’s policy statement and justify your response for *each* element with *two* arguments:

- i. Return Requirement
- ii. Risk Tolerance

**(12 minutes)**

**B. Formulate** the following elements of Stephenson’s investment policy statement and **justify** your response for *each* element with *two* arguments:

- i. Liquidity
- ii. Time Horizon

**(8 minutes)**

In addition, it was quite common on the early CFA examinations to give candidates choices (e.g., candidates were allowed to select the industry of their choice, the institution of their choice, or even which of two or three questions from a longer list they wanted to answer). For example, the 1965 Level III examination gave candidates the choice of answering either a bond or stock valuation question. That same examination gave candidates the choice of one of eight institutions (i.e., investment companies, endowment funds, pension funds, etc.) as the subject of a question and also asked candidates to answer a question in the industry of their choice. Today’s CFA examinations cover all of the broad topics in the CFA Program curriculum. For example, equity specialists cannot avoid debt or derivatives questions, or vice versa. No choices are given today, as all candidates must answer the same set of questions, each based on specific curricular readings. This policy is consistent with the premises that the CFA examination takes a generalist approach to security analysis and portfolio management and that all successful candidates have mastered the same curriculum and examination questions.

*continued*

## SAMPLE ITEM SET

(Appeared on the 2001 CFA Level II examination; each individual item is allotted 3 points or minutes.)

Questions 25 – 30 relate to Marge Farrell and Mike Land.

Marge Farrell, CFA, is a currency manager for Ganz International. Ganz currently has a large net position in U.S. dollars, which must be fully invested. In anticipation of the company's need for German marks (DM) in 6 months, Farrell is investigating the investment alternatives. She finds that the annual rate on 180-day U.S. Treasury bills is 6.0 percent, while the corresponding rate on similar instruments in Germany is 4.5 percent. She believes that various factors may slow the adjustment of spot and forward exchange rates and thus allow deviations from interest rate parity to exist temporarily, but only in the short run. The prevailing exchange rates are shown in Exhibit 7.

### EXHIBIT 7

#### Foreign Exchange Rate Quotations

Exchange Rates	US\$ per DM	DM per US\$
Spot rate	0.4900	2.0408
90-day forward rate	0.4930	2.0284
180-day forward rate	0.4961	2.0157

If Farrell determines that an investment in DM is advantageous now, she will also attempt to enhance returns by identifying arbitrage opportunities in the cross rates between DM and other currencies, which are shown in Exhibit 8.

### EXHIBIT 8

#### Currency Cross Rates

Country	US\$	Swiss Franc	Guilder	Yen	DM
Germany	2.0408	1.2460	0.8875	0.01960	—
Japan	104.74	63.944	45.547	—	51.021
Netherlands	2.2996	1.4039	—	0.02196	1.1268
Switzerland	1.638	—	0.71230	0.01564	0.8026
United States	—	0.61050	0.43486	0.00955	0.4900

Mike Land, a colleague of Farrell, has developed a model-based forecast, using fundamental analysis and the concept of purchasing power parity (PPP). Land believes that the threat of rising inflation will prompt the German central bank to tighten the money supply in Germany within the next six months. He forecasts that for the next year the U.S. inflation rate will average 2 percent, while the German rate of inflation is expected to average 5 percent.

25. Based on the 180-day forward rate, the annualized forward premium or discount on the DM is *closest* to a:
- 1.2% discount.
  - 2.5% discount.
  - 1.2% premium.
  - 2.5% premium.
26. With respect to interest rate parity and the possible flow of short-term funds, which of the following statements *best* describes the dollar-mark relationship?
- The dollar and the mark are at interest rate parity and there is no advantage to short-term movement of funds.
  - The dollar and the mark are not at interest rate parity and there is no advantage to short-term movement of funds.
  - The U.S. interest rate advantage is more than offset by the forward premium on the mark, and short-term funds will tend to move to Germany.
  - The forward premium on the mark is more than offset by the U.S. interest rate advantage, and short-term funds will tend to move to the U.S.
27. If Farrell wants to acquire German marks and take advantage of triangular arbitrage opportunities, she is *most likely* to buy:
- marks directly.
  - Swiss francs and sell them for marks.
  - Japanese yen and sell them for marks.
  - Dutch guilders and sell them for marks.
28. Based on Land's forecast, the expected US\$/DM spot rate in six months is *closest* to:
- 0.4760.
  - 0.4829.
  - 0.4972.
  - 0.5044.
29. Land is *most likely* to prefer a model-based forecast over a market-based technique because model-based forecasting:
- eliminates the need for out-of-sample forecasts.
  - tends to be consistent with the efficient market hypothesis.
  - explains how different microeconomic variables affect the demand and supply of a currency.
  - becomes appropriate when an analyst produces forecasts of fundamentals that are different than those produced by other analysts.
30. If Farrell believes that Land's forecast is accurate, she is *most likely* to invest in:
- marks now, and buy dollars for 180-day forward delivery.
  - U.S. T-bills now, and buy marks for 180-day forward delivery.
  - marks now, and expect to acquire dollars in the spot market at lower rates 180 days from now.
  - U.S. T-bills now, and expect to acquire marks in the spot market at lower rates 180 days from now.

Candidates today are also given an indication as to how much detail is required to successfully answer a question. For example, questions will state “discuss three reasons...” and the candidate will have some indication of how much discussion is necessary.

Although it may appear that the essay and problem portion of the CFA examinations has remained constant since the founding days of the program, the content is more rigorous and the candidates’ responses require a higher degree of specificity. The 2002 CFA examination is dramatically different from the examinations given in the early history of the program, reflecting how much investment management practice and the testing techniques used to evaluate that practice have evolved since then.

#### Examination Administration

Once the COE has finished writing the CFA examinations, the exams are sent to a secure printer — the same type of institution responsible for printing proxy statements and other sensitive financial information. After the examinations are printed, AIMR staff does a quality control check to make sure there are no significant errors in the printing process.

After printing, the examinations are held at the secure printer until the week of the examination. They are then shipped to the exam supervisors and securely stored until the day of the examination. Where possible, AIMR enlists the help of professional examination supervisors. The examination supervisors are responsible for selecting and training examination proctors. In addition, AIMR employees travel to the larger examination sites to ensure that the administration runs as smoothly as possible.

In 2002, CFA examinations were administered in more than 70 nations around the world to more than 76,000 candidates from 151 countries, with the utmost attention paid to the security and integrity of the examination process. This current situation is in sharp contrast to even 1985, when only 70 of the 4,285 candidates sat for the examination outside of North America.

Local AIMR society members and charterholders formerly were involved in the examination administration process. The change in policy to professional administration and supervision was the result of an extensive, two-year legal and security review of the CFA Program. AIMR no longer asks these individuals to participate in the process for two reasons. First, the charterholders working at the examination often would have friends or colleagues sitting for the examination. Although very few incidents came to light that would suggest any improprieties, AIMR wanted to avoid even the appearance of any impropriety. Second, many of the exam sites have grown too large to be administered on a part-time, volunteer basis.

AIMR strives to produce a fair and equitable examination environment. To ensure the integrity of the process, strict examination day rules are enforced. Candidates are required to bring a current, government-issued photo ID to the examination to ensure that charters are only being awarded to those individuals who actually passed the examinations. Candidates are required to use only approved calculator models, in order to ensure that some candidates do not use calculators that have the ability to store text in memory and thus gain an unfair advantage.

AIMR brings disciplinary actions against candidates who violate the published examination rules. Offenses such as writing past time called, failing to cooperate, and receiving assistance during the examination are investigated. Since 1998, AIMR has administered over 150 sanctions, ranging from private censure to prohibition from further participation in the CFA Program. In conjunction with these sanctions, the candidates’ examination results were also voided.

In light of the terrorist attacks of 11 September, other examination day rules have been enacted to better ensure the safety of CFA candidates, supervisors, and proctors. Candidates were not allowed to bring bags of any kind (including backpacks, briefcases, and luggage) into the test center in 2002. This policy is

consistent with other high-stakes examination testing organizations.

AIMR also complies with the Americans with Disabilities Act (ADA) and accommodations are made for candidates with demonstrated physical and learning disabilities. Although not required to extend these accommodations to non-U.S. citizens, AIMR does so. Accommodations are also made for Sabbath observers; the examination is offered on an alternative date for those individuals.

Once the examinations have been successfully administered, they are collected and shipped back to Charlottesville to be graded. One of the most astounding records is that, in the history of the CFA Program, to our knowledge, not one examination has been lost in transit from examination sites to AIMR. Needless to say, AIMR hopes this record continues well into the future.



#### GRADING

In 2002, more than 700 individuals from 35 countries spent a week in Charlottesville, VA, USA, exercising perhaps the most important duty available to CFA charterholders — grading the essay portions of the Level II and III CFA examinations. An additional 210 CFA charterholders then spent another week at “senior grading,” a process that re-evaluates marginal examinations, those exami-

*continued*

nations that fall near the minimum passing score (MPS).

The involvement of CFA charterholders in the grading of examinations is one of many checks and balances in the CFA Program to ensure that each candidate receives fair and consistent evaluation. The identity of all candidates is held in the strictest of confidence. Examination booklets identify candidates only by number, meaning graders are not privy to the name or even the geographic location of the candidates' examinations they evaluate.

Graders undergo extensive training with respect to evaluation procedures and techniques. AIMR always places first-year graders on teams with experienced graders. Grading coordinators oversee the grading process, ensuring that different grading teams treat candidates consistently across questions. Captains and assistant captains are responsible for overseeing grading teams — groups of charterholders responsible for grading all or part of *one* individual question. Individual graders grade only one question, which brings a high level of specialization to the process.

As with other activities related to the CFA Program, the system outlined above is a far cry from the early days of the program when a handful of individuals were responsible for grading all of the examinations. Even in the early 1980s, single individuals such as Charlie King, CFA, composed grading teams by themselves, a phenomenon that would be prohibitive in 2002 simply due to the size of the program. By the way, 2002 represented Mr. King's 29<sup>th</sup> consecutive year of grading. He is a shining example of the willingness that exists among AIMR's membership to give something back to the profession by participating in this hugely important process.

To ensure each grader has adequate time to prepare for his/her work, graders receive their question assignments, appropriate curricular materials, and draft guideline answer and grading key immediately following the administration of the examination. This allows graders to suggest changes to the guideline answer and grading key. Graders generally grade questions in their individual areas of expertise. AIMR

informs candidates that it publishes guideline answers after the examinations are graded to reflect some of the answers that were worthy of credit. However, it is important to recognize that frequently there is more than one appropriate answer to a question.

The expertise of graders in identifying appropriate answers to individual questions is an important component of the grading process. But, individual graders do not grade according to their personal views on individual questions. Graders often leave grading and state, "That is not the way I would have graded my question." In fact, members of the CFA Program's Council of Examiners may even disagree with the eventual structure of the grading key and guideline answer. Consensus opinion rarely is consistent with the opinion of any one individual. The overall strength of the grading process, therefore, is that the consensus opinion of many experts assigned to grade a particular question ultimately determines the final grading approach to each question. Again, consistency and fairness are hallmarks of the CFA Program.

Quality control is built into all aspects of the grading process. Entrance into the exam-grading center and especially into the exam checkout room is closely monitored. Examination personnel assemble examinations into stacks of 20. Only graders are permitted to check out examinations, and they may grade only one stack at a time. A formal audit process compares and reconciles points awarded by individual graders with points awarded by the team captain for the same candidate's response to a given question. Team captains (and coordinators) are provided with detailed statistical reports (including audit reports) to ensure that graders are grading consistently and accurately.

Level coordinators, team captains, and AIMR staff meet on a daily basis both individually and in groups to ensure consistent application of grading policies and rigorously monitor grader performance. Exams also are checked several times during grading to be sure that no grader recording errors or data entry errors have been made. The error checking process

is repeated several times even long after the grading process has been completed.

Once all examinations have been fully graded during the first week of grading, approximately 40 percent of the examinations near the middle of the distribution are graded in their entirety again, a process known as senior grading. Senior graders are, for the most part, a group from the grading population with substantial experience and expertise. The purpose of senior grading is to ensure that candidates whose papers fall near the minimum passing score are afforded every opportunity to pass the exam.

All examinations are subject to an additional quality control check. AIMR staff members go through each examination and make sure that the number of points awarded by the grader on the inside of the examination book is consistent with the number of points awarded on the outside scoring page of the examination book. Although inconsistencies between the two are extremely rare, these precautions are taken to ensure that it is always the candidates' performance alone that determines whether they pass or fail the examination.

### Setting the Minimum Passing Score

From 1963 through 1977, the MPS was described as being "70 percent of the total points." From 1978 through 1989, the MPS was publicized as "70 percent of the average of the several best papers" (It should be noted that the *several* best papers operationally referred to the top 1 percent of the papers). Since 1989, no one method of establishing the MPS has been utilized.

The CFA charterholders among the AIMR Board of Governors, who set the MPS each year, use a combination of performance metrics — 70 percent of the maximum points, 70 percent of the top paper, 70 percent of the top 10 papers, and 70 percent of the top 1 percent of papers — and a reading of specific samples of marginal examinations to determine the MPS for each level of the CFA exam. The governors meet, in person, and often spend multiple days analyzing data, reading papers, and deliberating on the MPS. In addition, at Level I the results of a standard setting

workshop, described below, are utilized as one of the criteria.

In 1996, a methodology for arriving at the MPS was introduced to the AIMR Board of Governors: the Angoff Standard Setting Method. The Angoff method was specifically developed for multiple-choice examinations, and has been employed as a supplemental criteria for the establishment of the MPS for the Level I examination. AIMR has retained psychometricians — experts in the design and measurement of examinations — to conduct standard setting workshops. Workshop participants are practicing CFA charterholders. These individuals participate in a systematic process that adheres to sound psychometric practice and typically yields a workable range of MPS values. It should be extremely comforting for both charterholders and candidates to note that the results of the Level I standard setting workshops have been remarkably consistent with previously utilized performance metrics (i.e., 70 percent of the top 1 percent, etc.).

For several years, a process known as the *Modified* Angoff Standard Setting Method was performed for Levels II and III. However, prior to the 2001 CFA examination, the AIMR Board of Governors determined that the methodology did not function as hoped for essay examinations and has discontinued the Level II and III standard setting workshops.

In any event, the standard setting results are *one* piece of information that the Board of Governors uses in establishing the minimum passing score. The determination of the operational MPS to use in practice, however, is a policy decision that is based on a variety of information. AIMR professional staff and the Board will continue to monitor advances in the psychometric community to augment the information currently employed to set the MPS.

### Pass Rates

The chart below provides the combined (or weighted average) pass rates for the CFA examinations since 1963. The combined pass rate is determined by multiplying the Level pass rate by the percentage of candidates who sat for that Level of the exam. For example, in 2002 the individual pass rates for Levels I, II, and III were 44 percent, 47 percent, and 58 percent, respectively. This, in turn, corresponds to a combined pass rate of 47 percent. Importantly, pass rates are calculated by those candidates who actually sat for the examination. If AIMR were to include the approximately 20 percent of enrolled candidates who do not sit for the examination each year (no-shows), pass rates would be dramatically lower.

As the chart below shows, the combined pass rates have dropped rather dramatically over time. In the early years of

the program, these rates were in excess of 80 percent. In the 1970s, pass rates were typically above 70 percent, while the 1980s witnessed pass rates in the mid to upper 60 percent range. The last three years have seen the lowest pass rates since 1994 and 1995 when the combined pass rate was 52 percent. 2002 was the first year the combined pass rate fell below 50 percent. Falling pass rates over time are typical in certification examination programs and reflect, among other things, the expansion of the candidate pool.

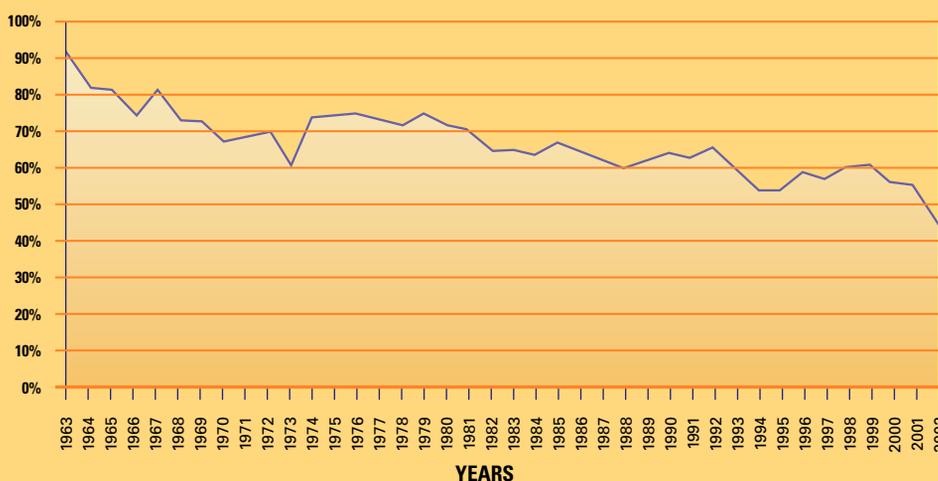
Candidates receive examination results in late July or early August. Last year, for the first time, results were available in a secure section of the AIMR Web site. AIMR posts scores as pass or fail and provides candidates with an indication of performance to help identify strengths and weaknesses. Candidates learn whether they scored less than 50 percent of the points, between 50 and 70 percent of the points, or above 70 percent of the points on specific topics at Level I and on specific questions at Levels II and III.

For several years in the mid- to late 1980s, AIMR sent letters of recognition to candidates who achieved top scores at each level. AIMR ceased this practice, however, for the protection of all charterholders. It became clear that some people interpreted the acknowledgement of top scores as identifying different “rankings” of candidates or charterholders. AIMR and the vast majority of candidates and charterholders were certainly not well served by this practice and it was eliminated. AIMR does not consider one candidate as more (or less) accomplished than another merely because of their relative ranking in a particular year. This is especially true for candidates taking the same level examination in different years. Results or ranking on a 1995 examination, for example, cannot be compared to results on the same examination in 1999.

### The Future of the CFA Program

We hope after reading this article that you agree that the standards and rigor of the CFA Program not only have been main-

**CFA EXAM COMBINED  
PASS RATE**



*continued*

tained over the years, but that they actually have been enhanced. As an indication of this, for every 100 candidates who entered the program in 1990, 30 earned a charter within five years. In 1996, for every 100 candidates who entered the program, less than 19 earned a charter within five years. The stakes of the CFA Program are higher than ever, as the CFA charter has become a de facto condition of employment in many investment management organizations.

In addition, largely as a result of AIMR advocacy efforts, the CFA designation is recognized by regulators throughout the world as signifying the pinnacle of investment knowledge and professional ethical standards in investment management. Securities commissions and regulators in 43 of the 50 U.S. states now grant CFA charterholders a blanket exemption from licensing requirements for investment advisers and investment adviser representatives. Notably, the CFA designation is one of only four designations that have been awarded this status by state securities commissions and regulators.

The CFA designation also is recognized by regulators outside of the United States as a means to meet or exceed competency or licensing requirements. The Investment Management Regulatory Organisation in the United Kingdom (predecessor to the Financial Services Authority) recognized the CFA designation as meeting its competency requirements, as has the Monetary Authority of Singapore, the Bermuda Monetary Authority, and seven provincial securities regulators in Canada (Ontario, Nova Scotia, Newfoundland, Saskatchewan, Alberta, British Columbia, and Quebec). AIMR has made application to the Australian Securities Investment Commission and the

Malaysian Securities Commission for exemptions from licensing requirements for investment advisers and investment adviser representatives. These actions, on behalf of charterholders, enhance the value — and substantially increase public recognition — of the charter.

In response to candidate, employer, and regulatory demand, for the first time in 2003, Level I of the CFA examination will be administered twice each year, in June and December. The December administration will take place in 23 sites around the world. A small percentage of AIMR members has criticized AIMR for this change. They see a second opportunity to pass the exam each year as devaluing the designation. They argue that if a candidate has two chances to pass an examination in a given year, the odds of passing increase. We do not dispute that; however, as anyone who has sat for the Level I examination can attest, passing is by no means a game of chance. If a candidate has not mastered the Level I Body of Knowledge, he or she *will not pass* the examination even with multiple opportunities to sit for the examination.

The issue of administrative ease is separate from the issue of program content ease. We advocate administrative ease, while not compromising program content and examination standards. We have candidates now who fail the Level I exam repeatedly, and are allowed to take the exam as many times as they like. The only way unqualified candidates will advance in the program is if standards are lowered. And the AIMR Board has clearly stated that relaxing standards is *not* an option. At a recent planning retreat, in fact, the Board established a clear guiding principle for governance of the CFA Program on which *all* decisions will be made: “Never lower

standards, either educational or ethical. Growth for growth’s sake is not the goal.”

In conclusion, we believe the state of the CFA Program is excellent. As emphasized throughout this article, much of the success of the CFA Program should be attributed to the willingness of a large group of practitioner charterholders to participate in the process by assisting an able AIMR professional staff in the development of the curriculum, in the secure administration of the examination, and in the fair and consistent grading of the examinations themselves.

If you are a CFA charterholder and you would like to participate in any of the activities described in this article, please contact AIMR Information Central ([info@aimr.org](mailto:info@aimr.org)). Do not be either surprised or offended, however, if you are not chosen to participate. We are fortunate to have an embarrassment of riches in that more CFA charterholders are willing to commit their time and effort to the program than we can possibly utilize. ●

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