International Section News

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SOA International Experience Survey—
Embedded Value Financial Assumptions

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The Society of Actuaries began its International Experience Survey (IES) in 2003 and presented a pilot study of mortality and persistency experience in three developing markets at the SOA 2003 Annual Meeting in Orlando. The IES was expanded to include a survey of financial assumptions contained in 2003 embedded value reports, the results of which are presented in this article.

The purpose of this survey is to provide international actuaries with benchmark assumption data. Since many companies make this information publicly available, no formal data request was issued. Instead, the survey was based on reports published on the Internet by eighteen companies centered in Australia, Canada and Europe that are active internationally.

Each financial assumption presented in this article is the average value of all companies reporting the assumption in their 2003 embedded value report. If no companies reported a specific assumption in a given country, then that assumption is labeled "NA," signifying that data is not available. Some companies vary assumptions by calendar year, while other companies use a single assumption; in the former case, the study was compiled based upon ultimate data.

Suggestions about additional sources of information and additional companies publishing embedded values are welcome.

Financial Assumptions from Survey

Financial assumptions presented in this article include:

(1) Discount rate—the rate used to calculate the present value of future distributable earnings
(2) Equity return—the total return on common stock investments
(3) Property return—the total return on investments in real estate
(4) Fixed return—the ultimate yield on a corporate bond portfolio held by an insurance company
(5) Government return—typically the yield on a 10-year bond offered by the local government
(6) Inflation—used to increase future expenses and, possibly, revalue policy terms.
(7) Tax rates—income tax rates by jurisdiction

COMPANIES INCLUDED IN SURVEY

Aegon	Allianz
AMP	Aviva
AXA	Fortis
Generali	Hannover Re
ING	Legal & General
ManuLife	Munich Re
Old Mutual	Prudential (UK)
Skandia	Sun Life
Swiss Life	Swiss Re

When reading Table 1, several thoughts should be kept in mind:

- Although practices vary, the discount rate is frequently set based on the Capital Asset Pricing Model (CAPM) methodology; in this case, many companies assume that their insurance company's volatility matches the market (i.e. Beta is equal to one), which results in a discount rate that is equal to the risk-free rate plus an average equity risk premium. Companies may also vary discount rates by product line to reflect the higher Beta associated with riskier business.
- Equity and property returns normally include both cash income (that is, stockholder dividends and rental payments) and asset value appreciation (or depreciation), and these yields may be reported net of investment expenses. Alternatively, equity returns may represent the fund appreciation prior to any fees or charges made against the fund. In all cases, equity and

LIMITATIONS

Readers should use judgement when interpreting the results of the survey and note that:

- When comparing one assumption to another, the reader should note that different companies might be contributing data to different assumptions, so that differences between variables may reflect differences between companies, rather than differences between the assumptions.
- Some cells include data from many companies, while others include data from as few as one company.

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COUNTRIES WITH NUMBER OF CONTRIBUTING COMPANIES

Argentina (1)	Australia (4)
Austria (3)	Belgium (6)
Bulgaria (1)	Canada (5)
Czech Republic (1)	Chile (1)
China (1)	France (8)
Germany (7)	Greece (1)
Hong Kong (3)	Hungary (2)
India (1)	Ireland (3)
Italy (6)	Japan (3)
Luxembourg (4)	Malaysia (1)
Mexico (1)	Netherlands (7)
New Zealand (1)	Poland (2)
Portugal (2)	Romania (1)
Slovakia (1)	South Africa (2)
South Korea (2)	Spain (6)
Sweden (3)	Switzerland (2)
Taiwan (2)	Thailand (1)
UK (10)	US (10)

property returns will be influenced by company investment strategy.

- Fixed returns reflect the investments in an insurer's bond portfolio. Amortized book yields are typically used in countries where book profits are based on amortized book value, while current market redemption yields are used when profits are calculated using market values. Companies generally do not disclose whether the fixed- income returns are net of defaults or investment expenses.
- The inflation assumption may differ from general inflation (for example, the increase in a consumer price index).
- Tax rates are dependent upon individual company circumstances (for example, the existence of tax loss carry forwards) and thus these rates cannot necessarily be applied to other companies.

Finally, it needs to be noted that some companies use identical assumptions for multiple countries (on the basis that this results in immaterial differences), and this practice would tend to dampen differences between countries.

Several observations can be made concerning Table 1:

- The discount rate varies within a narrow band in economically developed markets like the United States and Western Europe. The highest discount rates are found in emerging (or unstable) markets in South Africa, Latin America, India and parts of Central Europe.
- Companies may base their discount rate assumption on their equity return assumption (or vice versa) and this may be evident when comparing discount rates and equity returns in Table 1. In Western Europe and North America, where the survey has the greatest amount of data, the discount rate is slightly higher than the assumed equity return.
- The practice of investing general account assets in property markets is more common outside of the United States and Canada where there may be little or no legal restrictions on investment classes. This is particularly true in Europe, and South Africa, Australia and New Zealand.
- Equity and property returns generally exceed the fixed-income returns, as would be expected. An interesting observation is that property returns sometimes exceed equity returns in the southern hemisphere, while the equity returns exceed property returns in Europe.
- Fixed returns reflect the distribution of fixed-income securities in an insurer's portfolio and will tend toward the government return rate as the proportion of securities invested in government bond increases. Countries with a higher proportion of government bonds will have fixed returns closer to the government returns.
- Government bond returns vary slightly within the European Currency Union (euro zone), possibly indicating that investors see residual country risk even after the adoption of the currency union.

Investment Premiums and Other Marginal Relationships

Investment premiums are the additional yield an investor is expected to receive by purchasing an asset other than a government bond.

- Equity Premium—the excess yield from investing in common stock over the return on government bonds
- Property Premium—the excess yield from investing in real estate over the return on government bonds
- Credit Spread—the excess yield from investing in both corporate and government bonds over the return on government bonds

In addition, the following two marginal relationships may be of interest:

- Risk premium—the excess of the embedded value discount rate over the return on government bonds

TABLE 1—AVERAGE 2003 FINANCIAL ASSUMPTIONS	DISCOUNT RATE	EQUITY RETURN	PROPERTY RETURN	FIXED RETURN	GOVERNMENT RETURN	INFLATION	TAX RATES
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
COUNTRY							
AFRICA							
SOUTH AFRICA	12.7%	11.4%	12.0%	9.4%	9.1%	6.4%	37.8%
AMERICA-LATIN							
ARGENTINA	16.5%	NA	NA	NA	8.7%	7.0%	NA
CHILE	12.6%	NA	NA	NA	8.5%	3.0%	NA
MEXICO	13.1%	NA	NA	NA	8.6%	4.0%	NA
AMERICA-NORTH							
US	7.8%	8.2%	NA	5.7%	4.5%	2.3%	32.8%
CANADA	8.4%	8.3%	NA	6.2%	5.0%	2.0%	32.8%
ASIA							
AUSTRALIA8	9.0%	8.9%	7.7%	6.2%	5.6%	2.4%	NA
CHINA	8.6%	12.0%	NA	NA	4.5%	2.5%	NA
HONG KONG	8.9%	9.9%	NA	NA	5.0%	1.3%	NA
INDIA	13.1%	NA	NA	NA	7.0%	4.5%	NA
JAPAN	5.7%	6.8%	NA	NA	2.0%	NA	36.0%
MALAYSIA	10.6%	9.0%	NA	NA	6.5%	3.0%	NA
NEW ZEALAND	NA	6.3%	8.0%	6.5%	6.0%	2.5%	NA
SOUTH KOREA	9.7%	9.0%	NA	NA	5.8%	3.0%	NA
TAIWAN	8.1%	8.0%	NA	4.4%	4.3%	1.8%	NA
THAILAND	10.6%	NA	NA	NA	5.5%	NA	NA
EUROPE-CENTRAL							
BULGARIA	11.1%	NA	NA	NA	5.7%	3.1%	NA
CZECH REPUBLIC	7.9%	NA	NA	NA	4.8%	3.0%	NA
HUNGARY	8.7%	9.0%	9.0%	6.6%	5.6%	3.4%	NA
GREECE	7.6%	NA	NA	NA	4.5%	2.3%	NA
POLAND	10.9%	6.5%	NA	NA	5.6%	3.5%	19.0%
ROMANIA	12.8%	6.5%	NA	NA	7.0%	4.9%	NA
SLOVAKIA	8.2%	NA	NA	NA	5.1%	3.7%	NA
EUROPE-WESTERN							
AUSTRIA	7.5%	7.1%	NA	4.5%	4.3%	1.9%	33.0%
BELGIUM	7.5%	7.1%	5.8%	4.8%	4.3%	1.9%	NA
FRANCE	7.7%	7.0%	5.5%	4.7%	4.3%	2.2%	34.5%
GERMANY	7.5%	7.2%	5.1%	4.7%	4.3%	1.8%	39.9%
IRELAND	8.0%	7.3%	6.0%	4.5%	4.4%	4.0%	38.3%
ITALY	7.6%	7.5%	5.9%	4.5%	4.4%	2.7%	35.9%
LUXEMBOURG	7.7%	7.0%	5.1%	4.8%	4.2%	1.6%	NA
NETHERLANDS	7.6%	7.3%	5.9%	4.9%	4.3%	2.1%	25.0%
PORTUGAL	7.6%	7.0%	NA	4.5%	4.3%	NA	NA
SPAIN	7.6%	7.4%	6.3%	4.7%	4.4%	2.2%	35.0%
SWEDEN	7.5%	7.1%	NA	4.5%	4.5%	3.1%	NA
SWITZERLAND	7.3%	6.0%	4.5%	4.2%	3.5%	NA	NA
UK	7.7%	7.2%	7.0%	5.4%	4.7%	3.1%	30.0%
EUROPE-EASTERN/ASIA-NORTHERN							
RUSSIA	NA	NA	NA	NA	8.5%	NA	NA

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TABLE 2—INVESTMENT PREMIUMS AND OTHER MARGINAL RELATIONSHIPS	RISK PREMIUM	EQUITY PREMIUM	PROPERTY PREMIUM	CREDIT SPREAD	REAL RETURN
	(8)=(1)-(5)	(9)=(2)-(5)	(10)=(3)-(5)	(11)=(4)-(5)	(12)=(5)-(6)
COUNTRY					
AFRICA					
SOUTH AFRICA	3.6%	2.3%	2.9%	0.3%	2.7%
AMERICA-LATIN					
ARGENTINA	7.8%	NA	NA	NA	1.7%
CHILE	4.1%	NA	NA	NA	5.5%
MEXICO	4.5%	NA	NA	NA	4.6%
AMERICA-NORTH					
US	3.3%	3.6%	NA	1.2%	2.3%
CANADA	3.3%	3.2%	NA	1.2%	3.0%
ASIA					
AUSTRALIA	3.4%	3.3%	2.1%	0.6%	3.3%
CHINA	4.1%	7.5%	NA	NA	2.0%
HONG KONG	3.9%	4.9%	NA	NA	3.8%
INDIA	6.1%	NA	NA	NA	2.5%
JAPAN	3.7%	4.7%	NA	NA	NA
MALAYSIA	4.1%	2.5%	NA	NA	3.5%
NEW ZEALAND		0.3%	2.0%	0.5%	3.5%
SOUTH KOREA	3.9%	3.3%	NA	NA	2.8%
TAIWAN	3.8%	3.8%	NA	0.1%	2.5%
THAILAND	5.1%	NA	NA	NA	NA
EUROPE-CENTRAL					
BULGARIA	5.4%	NA	NA	NA	2.6%
CZECH REPUBLIC	3.1%	NA	NA	NA	1.8%
HUNGARY	3.1%	3.4%	3.4%	1.0%	2.2%
GREECE	3.1%	NA	NA	NA	2.2%
POLAND	5.3%	0.9%	NA	NA	2.1%
ROMANIA	5.8%	-0.5%	NA	NA	2.1%
SLOVAKIA	3.1%	NA	NA	NA	1.4%
EUROPE-WESTERN					
AUSTRIA	3.1%	2.7%	NA	0.2%	2.4%
BELGIUM	3.1%	2.8%	1.4%	0.5%	2.5%
FRANCE	3.3%	2.7%	1.1%	0.3%	2.2%
GERMANY	3.2%	2.9%	0.8%	0.4%	2.5%
IRELAND	3.6%	2.9%	1.6%	0.1%	0.4%
ITALY	3.2%	3.1%	1.5%	0.1%	1.7%
LUXEMBOURG	3.4%	2.8%	0.9%	0.6%	2.6%
NETHERLANDS	3.3%	2.9%	1.6%	0.5%	2.2%
PORTUGAL	3.3%	2.7%	NA	0.2%	NA
SPAIN	3.2%	3.0%	1.9%	0.3%	2.2%
SWEDEN	3.1%	2.7%	NA	0.0%	1.4%
SWITZERLAND	3.7%	2.5%	1.0%	0.6%	NA
UK	2.9%	2.5%	2.3%	0.7%	1.6%

- Real return—the excess of the government return over inflation

Table 2 presents the marginal relationships derived from Table 1. The column numbering continues the numbering in the prior table.

A few observations can be made concerning Table 2:

- Risk premiums range from 2.9 percent in the United Kingdom to 7.8 percent in Argentina with most developed country risk premiums in the 3-3.5 percent range. Argentina appears to be an example of where companies increase risk premiums to reflect foreign exchange and political risk.
- Equity premiums have greater variance than risk premiums, ranging from –0.5 percent in Romania to 7.5 percent in China, which represents a spread of 8 percent versus 4.9 percent for risk premiums.
- Property premiums are generally less than equity premiums, but are greater than credit spreads.
- Credit spreads reflect the proportion of government bonds included in the fixed-income portfolio. For example, U.S. investments are predominantly corporate bonds and asset-backed securities yielding a 120 basis point (bp) credit spread, while European investments have historically been heavily weighted towards government bonds, which results in a credit spread approximately equal to 50 bp.
- Real returns over inflation on "risk free" government bonds are generally in the 2-3 percent range with significantly higher returns in Chile, Mexico and, to a lesser extent, several Asian or Oceanic countries.

Please note that the data is relatively sparse outside the more developed countries in Europe and North America, so the observations and conclusions may change when additional data becomes available.

Summary

The International Experience Study Working Group (IESWG) has published this survey to enhance the knowledge of actuaries about current international market conditions and practices. Practice continues to evolve and we wish to encourage an open discussion on appropriate methodologies and further disclosure of both assumptions and the thoughts behind their formulation.

The IESWG intends to update this survey annually. We invite additional companies to provide data, on a confidential basis, to be included in this and future surveys. Please contact Ronora Stryker (rstryker@soa.org) or Jack Luff (jluff@soa.org) at the Society of Actuaries for further information. □

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Meet the New Kids

The Younger Actuaries Section got the nod of approval at the June 2004 Board of Governors meeting. The new section was created out of the need to establish a stronger link to recently qualified and future actuaries. Led primarily by younger actuaries, the section will work to advance the actuarial profession by addressing the needs of actuaries who are in the earlier part of their careers. Among other activities, the section will serve as a venue for the identification and development of future SOA leaders, will educate its members about and give them a voice in SOA activities, increase the sense of belonging to the profession, and will develop various programs targeted at professional advancement of younger actuaries. There is no age or credential requirement to join the section. Senior members are encouraged to join to stay in touch with the ideas and needs of the next generation of actuaries and to serve as mentors to the younger actuaries. Candidates and those early in their career are encouraged to join to link to the profession and benefit from section programs and activities that will further their professional and personal development. In order to ratify the section, 200 SOA members must sign up. Please support this cause, sign up today at *www.soa.org/ccm/cms-service/stream/asset/?asset_id=5179052&g11n.*

For more information, please contact Valentina Isakina, SOA Finance Practice Area Actuary at (847) 706-3584 or *visakina@soa.org*. □