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Comparison of Ratings Methodologies between Europe and the United States

by William Horbatt & Asutosh Chakrabarti

Standard and Poor's (S&P) publishes capital adequacy ratio (CAR) formulas for both the United States and Europe, but these formulas differ in various ways reflecting differences in markets. For example, the European formula explicitly recognizes that future profits on policies in force (embedded value) are available to absorb adverse experience while the U.S. formula, being based upon the detailed NAIC statement, has many more product type specific treatments.

As accounting standards converge between these two markets (in particular, those promulgated by the IASB and FASB), one may expect that these differences will diminish as well. However, by exploring these differences, actuaries may gain insight into risk and capital management that may enhance their abilities to contribute to the solvency of insurance companies on either side of the Atlantic.

This article presents a high-level comparison of S&P's published ratings standards in the United States and Europe. Starting with some background information on differences between the insurance markets on the two sides of the Atlantic, we proceed to compare the formulas used to determine capital adequacy ratios, then illustrate the differences in formulas using simplified examples. Although the article restricts itself to one ratings agency's practices, one may assume that other agencies have similar differences.

Differences between European and U.S. Insurance Markets

A short discussion of differences in markets is appropriate before analyzing the formula differences.

- Although European regulators encourage companies to separate life and non-life operations into separate companies, major European companies continue to have extensive life and non-life operations, unlike most U.S. companies
- Until European directives implement International Accounting Standards (IAS), which is expected to occur in 2005 – 2007, no common accounting standard exists in

Europe. Regulatory standards vary from country to country and company reports are frequently not public information. Accounts prepared under local generally accepted accounting standards (GAAP) are published. However, they vary from country to country and are sparser than U.S. standards. In fact, companies frequently apply U.S. GAAP to fill gaps in local standards.

- European life insurance companies focus primarily on savings products, with limited life insurance risk. Whereas in the United States, whole life, universal life and term insurance maintain significant (albeit declining) markets. Traditionally, the most popular European product was endowment insurance. However, pure savings products now dominate the southern European marketplace.
- European life insurance products have an extremely favorable tax treatment, when compared to the United States. For example, after 12 years in force, a German policy can be surrendered with no tax incurred. Contrast this to the United States, where a deferred annuity is taxed on a FIFO basis (withdrawals are first taxed as interest, with untaxed principal the last withdrawal) and is subject to excise taxes for withdrawals prior to age 59.5.
- European life insurance companies are generally not subject to strict limits on common stock investments, as U.S. companies are. They invested heavily in stocks during the 1990s to boost policyholder bonuses on general account products.
- European companies have been subject to minimum regulatory capital requirements varying by company size (frequently 4 percent of reserves plus 0.3 percent of net amount at risk), while the U.S.'s National Association of Insurance Commissioners (NAIC) risk-based capital (RBC) standards were developed around 1990.

Capital Adequacy Ratio

The capital adequacy ratio is probably the single most significant measurement applied by ratings agencies like S&P to evaluate the

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adequacy of an insurance company's capital. Although the NAIC and other ratings agencies have differences in their formulas, each formula compares the company's actual capital to a standard level of capital that is a function of the risks faced by the company. The higher a company's CAR is, the better the company's ability to absorb adverse financial experience.

In the United States S&P CAR is defined as:

$$\text{CAR} = (\text{Adjusted Surplus—Asset Risk Charges}) / (\text{Insurance Risk Charges})$$

While in Europe, CAR is defined as:

$$\text{CAR} = (\text{Adjusted Surplus—Asset Risk Charges}) / (\text{Insurance Risk Charges} + \text{Assets Backing Life Insurance Liabilities Risk Charges})$$

We see the first difference between the formulas in that the European formula includes risk charges related to the assets backing life insurance liabilities in the denominator, just like the NAIC risk-based capital formula. Additional differences occur in the components of this formula between the United States and Europe.

Adjusted Surplus

The next source of difference between the U.S. and European formulas is in the definition of adjusted surplus (called total adjusted capital or TAC by S&P) used in the calculation of CAR. These differences include:

- U.S.-adjusted surplus is based upon statutory surplus while European adjusted surplus is based upon local GAAP surplus, which, for U.S. stock exchange listed foreign companies, may be U.S. GAAP surplus.
- European companies receive a credit for up to 50 percent of the present value of future profits (PVFP) component of embedded value (EV) and non-life deferred acquisition costs (DAC) while U.S. companies receive no such credit.

Commonalities between the U.S. and European definitions of adjusted surplus include:

- No credit is given for goodwill in either formula.

- General fluctuation or equalization reserves are eliminated from liabilities and added to adjusted surplus. For example, the U.S. asset maintenance valuation reserve (AMVR) is added to adjusted surplus, as are European stabilization reserves.
- Non-life insurance claim reserves are adjusted to reflect the best estimate of payouts and then discounted to reflect the time value of money.
- Real estate is valued at approximate market value based upon a formula that capitalizes rental income.
- Credit is given for only a limited amount of hybrid capital, such as surplus relief.

Asset Risk Charges

Asset risk charges, similar to NAIC C-1 charges, are designed to anticipate expected defaults (credit risk) as well as a market volatility and illiquidity that would reduce the realizable value of assets liquidated to cover unforeseen cash draws. These charges are generally identical on both sides of the Atlantic, except for identifiable differences in financial markets. A comparison between the U.S. and European S&P asset risk charges follows:

- **Bond and preferred stock:** Default charges relate to the credit rating of the issuer and reflect the net cost of default over a 10-year horizon. Identical charges are made in the U.S. and European formulas.
- **Common Stock:** Market value volatility charges are based upon S&P's studies of historical volatility in various countries where indices exist and may vary considerably. The charges are based upon one standard deviation in observed samples. Examples of the differences are clear in Table 1 on page 8.
- **Real Estate:** Lack of liquidity varies by country, as do the risk charges. Note that real estate is an important investment in countries like Switzerland where fixed income yields are relatively low. (Figure 2).
- **Mortgages:** Mortgage practices differ significantly by country. However, the most significant difference is the lack of agencies guaranteeing home mortgages, such as Fannie Mae. For example, the U.S. charge

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Table 1

Country	Volatility Risk Charge
United States, Canada & United Kingdom	15 %
Belgium, Denmark, France, Germany, Italy, Switzerland	20 %
Norway, Spain, Sweden	25 %
Austria	35 %
Finland	55 %

for a guaranteed mortgage in good standing is 0.1 percent, while the lowest European charge is 2 percent.

- **Reinsurance Receivables:** Both the U.S. and European formulas recognize that reinsurance recoverables (including reserve credits) are more akin to assets than being liability offsets, so a risk charge is made to reflect expected losses due to reinsurer default. The charges are identical on both sides of the Atlantic and relate to the credit standing of the reinsurer.
- **Asset-Backed Securities:** These are less common in Europe than the United States, but it is anticipated that European ratings will follow procedures followed in sophisticated markets, such as New York or London.

Insurance Risk Charges

Insurance risk charges are intended to quantify risks that prices or reserves may be inadequate (as in NAIC C-2) or that a mismatch between assets or liabilities may result in losses (as in NAIC C-3). One will find significant differences between the magnitude of U.S. and European insurance risk charges.

For rating U.S. companies, the NAIC blanks for both life insurance and property and casualty insurance companies provide an extensive breakdown of financial figures based upon different types of business. No similar breakdown exists in Europe, except for more limited segment reporting that companies may provide for local GAAP reporting purposes. Hence European ratings agencies need to either accept published information or make special requests of the companies for data.

Property & Casualty: Due to the lack of public data in the European marketplace, S&P based its European risk charges for non-life products on

Table 2

Country	Liquidity Risk Charge
Germany	10%
Switzerland	12%
All other countries (including the United States)	18%

reports prepared by the American Academy of Actuaries Property/Casualty Risk-Based Capital Task Force. Hence, one may expect European charges to be consistent with U.S. P&C company risk charges.

Health Insurance: Due to the existence of nationalized medicine and generous social benefits for disability, unemployment and retirement, European companies offer more limited accident and health insurance products than U.S. companies.

S&P’s European premium related accident and health (A&H) risk charges are 18 percent of accident premiums and 12 percent of health premiums. For comparison purposes, U.S. products similar to common European products are shown in Table 3 on page 9.

In addition, S&P’s European A&H risk charges are 28 percent of accident reserves and 5 percent of health reserves. No risk charge related to reserves is applied to the U.S. products listed except for a U.S. risk charge equal to 5 percent of disability insurance reserves, which is the same as would be applied in Europe.

Life Insurance and Annuities: Prior to 2003, S&P’s European risk charge for life insurance and annuities was calculated as 125 percent of the local regulatory minimum capital, which frequently equalled 4 percent of general account reserves, 0.3 percent of net amount at risk and up to 1 percent of separate accounts. S&P has begun to revise their European formula to reflect differences in risk by country. The 2003 S&P European factors are shown in Table 4 on page 9.

In addition to these factors, a bond volatility factor (similar in purpose to the NAIC C-3) is calculated that depends upon the bond’s remaining term whenever the European insurer’s asset duration mismatches its liability duration by more than 1.5 years; otherwise a 1 percent factor is applied to bonds backing pension and savings product liabilities. The European bond volatility factors are shown in Table 5.

Adding the factors together in the two tables above, it can be seen that the reserve related general account risk factor for life insurance and annuities ranges from a low of 4 percent of reserves (for insurance written in France, Germany, Italy or Switzerland that has asset and liability durations sufficiently matched) to as much as 13 percent of reserves (for insurance written elsewhere with significantly unmatched asset/liability durations).

These factors appear to be significantly higher than the U.S. formula factors.

For example, European factors applied to the net amount at risk (NAR) range from 0.20 percent to 0.375 percent of the net amount of risk. The corresponding U.S. factors are split between individual and group insurance and have a reduction above \$500 million. Starting at 0.16 percent for group (0.20 percent for individual), they reduce to 0.07 percent for group (0.08 percent for individual) for NAR above \$20 billion.

Table 6, which contains selected U.S. reserve factors, can be used to illustrate differences for savings products like U.S. deferred annuities.

Typical European savings products are similar to U.S. deferred annuities with surrender charges, yet their reserve-based risk charge is twice the U.S. risk charge (4 percent versus U.S. 2 percent for products backed by bonds).

One potential reason for these differences is differences in asset liability management practices on the two sides of the Atlantic. Asset adequacy analyses, including the application of the “New York 7” scenarios, has been a regulatory requirement in the United States for well over a decade while European regulators have historically imposed limited testing requirements, if any, on their companies.

Comparisons Based Upon Hypothetical Company Data

In order to better understand the impact of the differences between the U.S. and European formulas, an example was developed for a hypothetical company with \$100 million general account assets and almost \$5 million statutory capital and surplus that underwrites individual life insurance and annuities. The company’s simplified financial statements are presented in Table 7 on the following page.

Table 3

U.S. Product	% Premium
Hospital Indemnity, ADD & other non-anticipating rate increases	8%
Dental	7%-10% *
Noncancelable individual disability (guaranteed premium rates)	18%-45% *
Other individual disability	9%-30% *
Group long term disability	4%-18% *

* lower factor applies to higher premium volumes

Table 4

Basis	Product	France, Germany, Italy, Switzerland	All other countries
Net Amount at Risk		0.200%	0.375%
General Amount Reserves	Pension & Savings	3.000%	5.000%
Separate Account	Unit Linked	0.250%	0.500%

Table 5

Bond Maturity	Mismatch Risk Charge
1 year to maturity	1%
2 years to maturity	2%
2-5 years to maturity	4%
5-10 years to maturity	6%
Over 10 years to maturity	8%

Table 6

U.S. Product	Risk factor applied to reserves.
Life insurance reserves net of policy loans	0.50%
Annuity reserves with market value adjustment	1.00%
Annuity reserves with surrender charges	2.00%
Annuity reserves with no adjustments	3.00%

Based on this information, the company’s CAR can be calculated as shown in Table 8. Notice that the two formulas produce approximately the same ratio, which is within the “A” rating range of 125 – 150 percent. The additional GAAP capital resulting from including unrealized capital gains and intangible assets (DAC) in the European formula offsets the higher liability risk charges.

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Table 7

Assets		SAP	GAAP
	Bonds	100,00	105,00
	Equities	-	-
	Separate Accounts	25,000	25,000
		125,000	130,000
	DAC		4,769
Liabilities			134,769
	Policy Reserves	95,133	96,850
	Separate Accounts	25,000	25,000
		120,133	121,850
	Deferred Tax		3,419
			125,269
Equity			
		4,867	9,500

Table 8

	U.S.	Europe
Reported Capital	4,867	9,500
Eliminate 50% of DAC (net of tax)	-	(1,500)
TAC	4,867	7,950
Asset default risk charges	(1,495)	-
Asset volatility risk charges	-	-
Numerator	3,372	7,950
Asset default risk charges		1,495
Asset volatility risk charges		1,000
European asset risk charges		2,495
Reserve & other risk charges	2,452	3,280
Denominator	2,452	5,775
CAR	138%	138%
CAR in the Ratings Range of:	A	A

Table 9

	U.S.	Europe
Reported Capital	5,029	9,500
Eliminate 50% of DAC (net of tax)	-	(1,550)
TAC	5,029	7,950
Asset default risk charges	(1,420)	-
Asset volatility risk charges	(750)	-
Numerator	2,860	7,950
Asset default risk charges		1,420
Asset volatility risk charges		1,700
European asset risk charges		3,120
Reserve & other risk charges	2,419	3,130
Denominator	2,419	6,250
CAR	118%	127%
CAR in the Ratings Range of:	BBB	A

Having seen the impact from applying the two different formulas to a U.S. company, the company data can be modified to better reflect a typical European company:

- European companies frequently invest in common stocks in order to enhance the investment returns credited to policyholders, so the general account assets are reallocated to include 5,000 stocks.
- European companies sell less permanent “risk” life insurance and their savings products frequently have no surrender charges, so we will change the assumption that the general account liabilities are one-third low risk (life insurance), one-third medium risk single premium deferred annuity (SPDA with surrender charges) and one-third high risk (no surrender charges) to the assumption that ¼ are low risk and the remainder split between medium and high risk.

Table 9 reflects these changes in the investment strategy and product mix. It shows the capital adequacy ratio declining and the European formula producing a more favorable ratio.

In this case, the U.S. formula CAR drops 20 percent, while the European CAR drops half that amount. The effect is that the typical European company would maintain its “A” rating using the European formula while dropping one rating using the U.S. formula.

Note that there may be very good reasons for this difference since European policyholder behavior may be different from that in the United States. For example, Europeans tend to lapse policies at a much lower rate than Americans during the early contract years due to adverse personal tax consequences for early lapse.

Conclusion

The two most significant differences between the U.S. and European S&P capital adequacy ratio formulas are:

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A German Centennial

by Tauno Jaekel

The actuarial organizations of Germany, the Deutsche Aktuarvereinigung e.V. (DAV) and the Deutsche Gesellschaft fuer Versicherungs – und Finanzmathematik e.V. (DGVM), held their centennial celebration last November in Berlin. It was in this historic city, on April 4, 1903, that the Department of Insurance Mathematics (Abteilung fuer Versicherungsmathematik) was established as a section of the Deutscher Verein fuer Versicherungswissenschaft e.V. (German Society for Insurance Sciences).

It is from this department that today's two actuarial organizations got their start. While DAV is the actual professional organization of actuaries, the DGVM is—similar to the American Academy of Actuaries—a membership body for all who are contributing to the furtherance of the actuarial and finance mathematical sciences. It was not until 1993, when the then-only actuarial organization DGVM split into a professional organization (DAV) requiring formal training and education for membership and a body for all those furthering the actuarial and finance mathematical sciences through research and publications

(DGVM), that the professional designation Versicherungsmathematiker Aktuar (actuary) was formally established. Until then, actuaries had been called Versicherungsmathematiker (insurance mathematicians). Today, with membership at around 2,000 and several hundred actuarial students in the examination process, the DAV has grown to be the second-largest actuarial body in the EU, surpassed only by the traditional British Institute of Actuaries.

The centennial celebration began with a gala evening and continued the next day with a ceremony. Many members, retired members and accompanying spouses, as well as representatives of other international actuarial organizations, participated in this wonderful and memorable event.

Looking back on 100 successful years, the German actuarial profession can confidently face today's challenges when capital markets are more volatile; regulatory, legal, tax and accounting environments seem constantly changing when the actuarial field itself appears to be broadening. □

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- The European formula credits adjusted surplus with a portion of unrealized capital gains and future earnings.
- The U.S. formula requires less reserve related risk charges, including charges related to ALM.

These differences are offsetting in direction, so no conclusion can be made as to the relative rigor of the two formulas without applying them to particular facts and circumstances.

However, the European practice of crediting some portion of embedded value PVFP appears to be a reasonable practice in light of the fact that a company suffering adverse experience

may have the ability to increase capital by selective sales of portfolios or reinsurance purchases. Similarly, recent reductions in European life insurance reserve related risk charges appear to be warranted when comparing European products to similar U.S. products.

Finally, a very important caveat needs to be stated. Standard and Poors and other ratings agencies rely heavily on their ratings analysts' judgment and their analyses evaluate many factors other than capital levels. In addition, an increasing number of companies are having their capital levels evaluated using more sophisticated methodologies than the CAR formula described in this article. □