

**TRANSACTIONS OF SOCIETY OF ACTUARIES
1993-94 REPORTS**

**THE POTENTIAL ROLE OF DYNAMIC SOLVENCY TESTING
IN PREVENTING INSOLVENCIES OF INSURANCE COMPANIES:
A HISTORICAL PERSPECTIVE**

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I. INTRODUCTION AND SUMMARY

A. Background

In January 1994, the Society of Actuaries (SOA) published a Request for Proposal (RFP) calling for a study from a historical perspective of the potential role of Dynamic Solvency Testing (DST) in preventing insurer failures. The RFP noted that the interest in this study arose from the "Position Statement on Insurer Solvency" adopted by the American Academy of Actuaries (AAA) in September 1992. The statement recommended, among other things, the annual preparation of a surplus adequacy report by a qualified actuary.

In response to the AAA Position Statement, the SOA Board of Governors established a DST Task Force to "produce a plan of action ... so that by 1995 the following is a true statement:

An actuary has access to the necessary research, education, and training ... [to] provide a life and health insurer's management with a report on the current adequacy of the company's surplus."

The DST Task Force's report was discussed at the 1993 Spring Meetings of the Society. The SOA has since initiated several related research projects, and another task force is preparing the *Dynamic Financial Condition Analysis Handbook* [Editor's note: The *Handbook* was published in February 1995.]

B. Purpose of Research

The impression that DST would provide credible and otherwise unavailable signals of future threats to a company's financial well-being, with the potential to help prevent insurer failure, is intuitively plausible. The Society Committee on Financial and Investment Management Research concluded that this impression needed closer examination. The aim of this study is to provide that examination by identifying major cause(s) of failure for a small group of companies and evaluating whether and how DST would have helped each company prevent its failure.

C. Research Considerations and Data

The research began by selecting a group of six companies that failed in 1991, using the selection procedures detailed in Appendix A. The committee specifically requested that Executive Life Insurance Company, Executive Life Insurance Company of New York, and The Mutual Benefit Life Insurance Company be excluded, because their failures have been extensively reported and analyzed by news media and other publications. The committee asked that the study focus on less highly visible companies.

Statutory financial and other data were gathered to provide a basis for identifying the major cause(s) of each company's failure. That data and an analytic framework developed for this study were used to form opinions of DST's potential for helping to prevent failure. The analytic framework consists of the DST evaluation standard described below and a set of possible constraints on the potential usefulness of DST outlined in Section II.A.2, Potential Role of Dynamic Solvency Testing. All financial data used and financial results otherwise referred to in this report are on a statutory basis.

No official requirement for DST has been established by U.S. regulatory authorities, and no standards of actuarial practice for performing DST have been promulgated for actuaries advising U.S. companies. In this study, DST is considered to be:

The measurement of a company's present and future financial condition by the use of modeling that explores sensitivity to potential future events that may affect the company financially under a variety of plausible scenarios, both for the company in total and by major lines of business, over a period of several calendar years following the last calendar year-end as of which the company has been in business.

"Financial condition" is defined as set forth in the October 1994 draft of the Society of Actuaries *Dynamic Financial Condition Analysis Handbook* as:

The ability of the company's capital, surplus, and other items such as the Asset Valuation Reserve to adequately support that company's future operations over an unknown and unpredictable set of economic, operating, competitive, and regulatory environments.

DST as defined here shares important elements with other forms of financial analysis such as profit-testing and other less encompassing financial projections that are commonplace in actuarial practice. Because of this, a

basic standard was established as a tool to help evaluate the unique potential of DST in preventing the insurance company failures studied.

This basic standard, intended to isolate important contributions that DST offers beyond those of other forms of financial analysis, was:

Does it now seem reasonable (without attempting to retroactively perform it) to hypothesize that such testing conducted as of the close of business in calendar year 1986 would, under plausible assumptions made and tested at that time, have signaled the occurrence of either

- (a) A significant drop in the company's ratio of capital and surplus to assets, or
- (b) A significant decay in the company's ability to meet cash demands (as modeled in the testing) without sale of assets at a loss by or before the end of calendar year 1991, over any interval following 1986, for reasons related to the identified major cause(s) of failure?

This basic standard is not fully representative of what DST might afford in any given case. It was used in this study as a baseline for judging the potential value of DST in preventing a company's failure. One might draw different conclusions if the assessment were expanded to consider the potential value of DST performed regularly at each year-end beginning several years before 1986. The simpler single-year test involves such a large measure of judgment that such an elaboration did not appear appropriate for this study.

Data used for each company to identify major causes of failure and to evaluate DST's potential for preventing failure are shown in Section II, Analysis. The tables in that section provide a company-specific discussion of cause(s) of failure and of DST's potential value.

D. Conclusion

For two of the six companies studied (Fidelity Bankers and Inter-American), it was concluded that, as measured in this study, DST would have had a significant potential role in preventing their failures. For three of the four others (Atlantic & Pacific, Legacy, and Old Southern, all primarily engaged in individual health insurance business), it was concluded that while DST would have been helpful, the purpose it might have served could have been adequately met by the use of less extensive financial analysis. For the remaining company (American Financial), it was concluded that the need for corrective actions that DST would have signaled was evident from other statutory financial data available to the company.

Because the study focused on failed companies, it does not consider companies that are financially healthy and use DST. It also does not consider

companies that were having financial difficulties, used DST to identify potential problems, and subsequently took actions that retained or restored their financial well-being. Thus, it does not consider all possible situations for which DST might have been helpful.

In view of the small number of companies studied and the reliance placed upon judgment unsupported by detailed modeling, this study should not be viewed as proving or disproving the potential value of DST in preventing insurer failures. Suggestions for additional research that may shed further light on the potential value of DST in preventing insurer failures are offered in Section III.

II. ANALYSIS

A. Introduction

Each company-specific analysis begins with an array of data chosen to help understand the company's circumstances and reasons for its failure and to supply a context for evaluating whether and how DST might have helped it to avoid failing. Dates of regulatory intervention shown are dates of the first official action taken by the insurance department in the company's state of domicile and include any state action restricting the company's ability to conduct business normally. Data such as state of domicile, ownership, territory, and so on that are subject to change over the company's history are as indicated in the last detailed credit report published in Best's Insurance Reports prior to 1992. The A.M. Best rating symbols shown are defined in Appendix B. References to the Best Study are to A.M. Best's June 1992 Special Report, "Best's Insolvency Study, Life/Health Insurers, 1976-1991."

The company-specific analyses conclude with a specification of the major causes of failure identified and an evaluation, using the standard described in Section I, of the role DST might have played in preventing that failure.

1. Causes of Failure

The following are some thoughts to keep in mind in considering the identification of causes of failure:

- A. Although the focus of this study is on major causes of failure, most insurer failures probably are the result of many causes, some of which may not be identified from publicly available data. Examples of such causes include faulty product design and unsound mortality/morbidity-risk-selection practices. Scattered instances of other unsound practices

may cumulatively over time serve to undermine a company's strength, even though they do not clearly stand out as individually important causes. (In conducting DST, an actuary familiar with the company's circumstances should be able to test each factor that is material, individually and possibly in combination.)

- B. No matter how causes of failure are identified, conclusions should be tempered by recognizing that other important forces may be contributing to any identified cause. If, for example, the problem appears to be over-exposure to a high-risk asset class, this may be driven by a company's inability to remain price-competitive in its markets, which may in turn be rooted in an inadequate scale of operations.
- C. Better described as strategic deficiencies than as causes of failure, any of the following characteristics increase a company's susceptibility to failure (the individual company discussions draw attention to those apparent in each case):
- Limited diversification in lines of business
 - Weak business franchises with poorly defended competitive positions
 - Limited access to capital on economically appropriate terms
 - Ownership by a parent company that may be expected to impose financially weakening demands
 - Deficiencies in the experience or expertise of company management and other key personnel (including concerns regarding future management succession)
 - Deficiencies in management practices (including lack of a coherent business strategy, poor communications, wasteful expenditures, inadequate accounting and other management information systems, and aggressive accounting practices involving balance sheet "window-dressing," and the like)
 - Size of company or line-of-business operations falling below that required to succeed.

2. Potential Role of Dynamic Solvency Testing

Possible constraints on the contributions that may be made by DST in preventing insurer failures are listed below. The company-specific discussions of the potential value of DST provide further commentary on such constraints.

Timeliness

At what point are the adverse circumstances of a company too far advanced for DST to provide a valuable contribution to seeking solutions?

As long as a company has freedom to continue conducting business, the opportunity remains to use financial analysis, including DST, to better understand how to improve its prospects (if only to limit the damage done to policyowners and others when failure occurs). However, the opportunity diminishes as the point of actual failure draws nearer. This will depend on the circumstances of the company. For example, if most of the company's business is nonparticipating with guaranteed premium rates, the opportunity to take remedial action may disappear sooner than if most of the business has nonguaranteed premiums. In this study, as specified in Section I, the basic standard for evaluating DST assumes the testing was performed as of the end of 1986, projecting to the end of 1991.

Resource Constraints

Does the company have the financial and other resources necessary, including personnel who can take the necessary time with whomever does the testing?

One might conjecture on this by individual company, but little exists in the publicly available data with which to evaluate such conjectures. For example, one could suppose that larger companies are better able to undertake such an effort than smaller ones. It does not appear that DST was beyond the means of any of the six companies studied. For smaller companies with no actuarial staff, a related constraint would be the need for senior managers to become aware of and convinced of the potential value of DST.

Validity of Assumptions

Is it possible to develop valid assumptions for DST?

Access to Information

Is the actuary performing DST provided access to all relevant available information, some of which ordinarily is treated as confidential?

DST reports are only as good as the information on which they are based. In developing company-specific conclusions, it has been assumed that no constraints would have been placed on securing available information requested.

Credibility and Understandability

Are modeling assumptions and methodologies made credible to and understood by senior managers who are responsible for using testing results?

This is almost entirely a matter of the individual DST practitioner's abilities and efforts, assuming reasonable cooperation by senior managers.

Relevance

Does DST identify the significant potential threats faced by the company?

The test of relevance in this study is whether the signals required by the basic standard defined in Section I would have been related to one or more of the identified major causes of failure.

Addition to Other Information

Does DST add to other information already available to the company?

As described in Section I, the basic standard employed for evaluating potential value is whether significant deterioration in surplus ratios or liquidity would have been signaled by 1986 year-end DST.

Regulatory Access and Response to DST Reports

Do regulators have access to DST reports? If so, under what circumstances? How seriously do regulators take DST and its conclusions?

Regulatory access and response to DST reports for the companies studied could have significantly affected the role DST might have played in preventing their failures. In developing company-specific conclusions, it has been assumed that the DST results would not have been provided to regulators.

B. Company-Specific Analyses

Company-specific analyses are given in the following tables:

- Table 1 American Financial Life Insurance Company
- Table 2 Atlantic & Pacific Life Insurance Company of America
- Table 3 Fidelity Bankers Life Insurance Company
- Table 4 Inter-American Life Insurance Company
- Table 5 Legacy Life Insurance Company
- Table 6 Old Southern Life Insurance Company

TABLE I
AMERICAN FINANCIAL LIFE INSURANCE COMPANY

Company Data	
Date of regulatory intervention: April 3, 1991	
Best study primary cause category: Overstated assets ¹	
A.M. Best ratings:	
3 years before financial impairment	NA-7
2 years prior	NA-7
1 year prior	NA-7
At time of impairment	NA-7
Domicile: Florida	
Formation/ownership: Formed in 1973; acquired in 1978 as a wholly owned subsidiary of Funding, Inc., a Florida holding company	
Territory: Alabama and Florida; also marketing in Central and South America beginning in 1986	
Major lines of business: Individual credit life and health until 1989; subsequently, individual life and major medical insurance were emphasized	
Distribution of selected assets by asset type as a percentage of admitted assets (12/31/90):	
Bonds	4%
Stocks	31%
Mortgages	0%
Real estate	41%
Short term	6%

Other 1986-1990 statutory financial data (amounts shown in thousands of dollars):

Year	Admitted Assets	Capital and Surplus (C&S) [*]	Surplus Ratio [†]	Net Gain From Operations [‡]	Common Stock & Real Estate as % of C&S
1986	\$14,221	\$1,075	7.6%	(\$1,148)	655.1%
1987	11,514	2,231	19.4	(110)	309.0
1988	12,268	1,326	10.8	(945)	520.1
1989	9,478	1,101	11.6	1,839	526.6
1990	7,758	1,172	15.1	103	480.3

*Includes surplus notes and unpaid interest thereon.

†Capital and surplus as a percentage of admitted assets.

‡Prior to 1986, operating losses were consistently incurred.

Use of surplus notes: The company's parent issued surplus notes to cover accumulated operating losses. At year-end 1989 these notes and interest payable on them amounted to \$5.9 million.

Apparent strategic deficiencies: Limited diversification by line of business, weak business franchise strength, limited access to capital, inadequate scales of operation, and possibly-deficient management practices

¹Defined as asset problems with an insurer's own investments, whereby a significant decline in market value, large holdings of inappropriate or unauthorized assets, or lack of asset diversification results in financial impairment.

TABLE 1—*Continued*

News media commentary on reasons for company failure: *Business Wire*, reporting on April 3, 1991, quoted the Florida Insurance Commissioner on the department's placement of the company in receivership as follows: "The company's primary problem is one of liquidity. The order will enable us to attempt to help the company sell some of its real estate holdings so it can continue to operate and pay claims." The article says the Commissioner said the company was about 60 days behind in meeting claims.

Cause(s) of Failure

The Best Study placement of this company's primary cause of failure in its overstated assets category (particularly with respect to its concentration in real estate) appears appropriate. Other important factors include the company's inadequate capitalization and long-term problems with generating profits.

Potential Value of DST

Timeliness

At year-end 1986, this company was clearly already in a financially precarious position. It had been reporting statutory losses for several years and had nearly half of its admitted assets invested in common stock and real estate. Its statutory loss in 1986 was almost 150% of its prior year-end capital and surplus. Its parent company was responding to this by providing surplus notes to maintain its solvency.

By year-end 1986, the threat of future liquidity problems (the immediate cause of the company's failure) and the threat of significant future declines in surplus ratios (without additional surplus contributions from the parent) that might have been signaled by DST performed at that time were evident otherwise. That is, for DST to have made a contribution to preventing this company's failure it would have had to be used before the need for changes in its capitalization and investment practices was otherwise evident.

Resource Constraints

The expected cost/benefit tradeoff of conducting DST would have been very important for a company of this size in deciding whether to undertake it, even if the resources required were available. This tradeoff would not have appeared promising, unless DST would have been expected to provide insights or information beyond that otherwise available. As discussed under *Timeliness*, since the company's problems were evident without incurring this additional expense, its management would have been understandably reluctant to pay more for DST's more detailed elaboration of its foreseeable difficulties.

Validity of Assumptions

Obtaining reliable company-specific experience data probably would have been difficult, if not impossible, for this company. It is unlikely that it would have had, or could have readily prepared, experience studies that could be used in setting DST modeling assumptions such as mortality or morbidity. It would probably, nevertheless, have been possible to develop assumptions employing adjustments to data from other sources. After testing to assure the approximate replication of prior year aggregate results, these assumptions could serve as valid baseline assumptions for all but amounts of new business to be written. Since erratic or explosive new business growth was not a contributor to the company's failure, it is unlikely that the new business assumptions that would have been modeled by DST would have impaired its predictive value for this company.

TABLE 1—*Continued*

Relevance

Had DST been done as of year-end 1986, expected results would have included signals pointing to the threat of diminishing surplus ratios and future liquidity problems over the 1986–1991 interval, and would thus have been related to the company's immediate cause of failure: liquidity.

Addition to Other Information

Despite the difficulties, DST could have been performed and would have thrown off relevant signals about future financial difficulties. However, these signals would have been confirming, not adding to, evidence otherwise available. It is conceivable that there might have been a point some years prior to year-end 1986 when the problems evident in 1986 would not have been apparent without the use of DST. If that were so and if DST had been performed then, with its results leading to correction of the problems apparent in 1986, DST might have served to help prevent the company's failure.

Overall Conclusion

This company should not be classified as one for which (as measured in this study) DST would have had a significant potential role in preventing its failure. The need for corrective actions that DST would have signaled was evident from other information available to the company.

TABLE 2

ATLANTIC & PACIFIC LIFE INSURANCE COMPANY OF AMERICA

Company Data	
Date of regulatory intervention: April 18, 1991	
Best study primary cause category: Inadequate pricing/surplus	
A.M. Best ratings:	
3 years before financial impairment	B
2 years prior	B
1 year prior	B
At time of impairment	NA-7
Domicile: Georgia	
Formation/ownership: Incorporated in 1958 with control held by First American Corporation of Atlanta, Georgia—the owner of all outstanding shares of stock	
Territory: Licensed in 16 states, with business writings concentrated in Georgia, Alabama, Mississippi, and Tennessee	
Major lines of business: Individual life and health insurance, with a heavy concentration (74% of premium in 1990) in individual health coverages	
Distribution of selected assets by asset type as a percentage of admitted assets (12/31/90):	
Bonds	55% (6 year average maturity; 96% of long term bonds of investment grade)
Stocks	6%
Mortgages	3%
Real estate	9% (carried at 129.5% of cost; home office carried at 18% of capital and surplus)

Other 1986–1990 statutory financial data (amounts shown in thousands of dollars):

Year	Admitted Assets*	Capital and Surplus (C&S)	Surplus Ratio†	Net Gain from Operations	Common Stock & Real Estate as % of C&S	Accident & Health Combined Ratio
1986	\$10,500	\$2,007	19.1%	\$0	39.9%	132.1%
1987	11,264	2,199	19.5	112	35.4	110.9
1988	12,162	2,001	16.5	(272)	37.8	115.3
1989	13,667	2,076	15.2	51	61.9	97.6
1990	7,795	1,269	16.3	(21)	56.1	126.4

*1990 drop in assets reflects a large ordinary life coinsurance transaction.

†Capital and surplus as a percentage of admitted assets.

Apparent strategic deficiencies: Limited diversification by line of business

News media commentary on reasons for company failure: The April 19, 1991 issue of *The Atlanta Journal and Constitution* quotes the Georgia Insurance Commissioner as characterizing the company's problems as having nothing to do with investments, but as being the result of bad marketing strategy. The article notes that during the previous year the firm incurred losses when it moved into medigap and long-term-care policies.

TABLE 2—Continued

Cause(s) of Failure
The Best study placement of this company's primary cause of failure in its inadequate pricing/surplus category (particularly with respect to its individual health insurance pricing) appears appropriate. No other major causes are evident.

Potential Value of DST
<i>Timeliness</i>
At year-end 1986, the company exhibited reasonable prospects for continued survival although its 1986 earnings were nil owing to health insurance losses that offset gains in other lines. The data available does not suggest it was too late then to take advantage of DST in planning actions necessary to ensure its continued financial health.
<i>Resource Constraints</i>
Because continuing losses in its health business held the potential of eroding its capital, financial analysis to understand the changes needed in its health insurance product design, pricing, underwriting and marketing should have been seen as worthwhile, unless the need for such changes was already known to be necessary and management was unwilling or unable to make them. However, the company probably would have chosen something well short of DST as defined in this study to carry out that analysis. It might have, for example, combined projections of gains or losses from existing blocks of health insurance with new health business projections using current pricing assumptions, with no modeling of other lines of business and ignoring or using current aggregate investment returns.
<i>Validity of Assumptions</i>
Obtaining reliable company-specific experience data would have been difficult for this company. It probably could have developed assumptions using adjustments to data from other sources that (after testing to assure the approximate replication of prior year aggregate results) could serve as valid baseline assumptions for all but amounts of new business to be written or new product offerings. It is doubtful that 1986 testing would have anticipated new product offerings such as medigap and long-term health care (which were introduced in 1990 according to the <i>Atlanta Journal and Constitution</i> article cited previously) and new premium growth would probably have been underestimated without anticipating those later product introductions. Nevertheless, 1986 DST results would probably have exhibited significant continuing health insurance business losses assuming current practices were continued.
<i>Relevance</i>
Had DST been done as of year-end 1986, expected results would have shown continuing health insurance business losses. Whether they would have shown significant declines in surplus ratios is questionable. (The adverse 1990 health insurance experience probably was mostly related to the medigap and long-term health-care products introduced that year and unlikely to have been anticipated by 1986 year-end DST studies). DST performed at a later date when the plans for introducing new health insurance products were known might have predicted those 1990 losses, but it is likely that they could have been identified without using a full-scale DST analysis.

TABLE 2—*Continued*

Addition to Other Information

Although it is likely that DST performed as of year-end 1986 would have signaled the need for changes in one or more of the company's health insurance product design, pricing, underwriting or marketing, it also is likely that the need for such changes could have been adequately established through other less elaborate financial analysis, such as that suggested under Resource Constraints.

Overall Conclusion

This company should not be classified as one for which (as measured in this study) DST would have had a significant potential role in preventing its failure. Much less elaborate financial analysis could have adequately signaled the need for corrective actions.

TABLE 3

FIDELITY BANKERS LIFE INSURANCE COMPANY

Company Data	
Date of regulatory intervention: May 13, 1991	
Best study primary cause category: Overstated assets ¹	
A.M. Best ratings:	
3 years before financial impairment	A+c
2 years prior	A+c
1 year prior	A+c
At time of impairment	B+

Domicile: Virginia

Formation/ownership: Formed in 1967; purchased in 1976 by Monarch Life Insurance Company; sold to a wholly owned subsidiary of First Capital Holdings Corp. in 1985. 44% of the outstanding common stock was acquired by Shearson-Lehman Holdings, Inc. in 1988. (First Capital Life Insurance Company, domiciled in California, was another subsidiary of First Capital Holdings Corp.; it became financially impaired on May 14, 1991.)

Territory: The District of Columbia and all states except New York

Major lines of business: Individual life and annuity business; traditional (non-interest-sensitive) block of life business was sold in 1990. Business was distributed through insurance brokerage agencies, personal-producing general agents, and other financial institutions.

Distribution of selected assets by asset type as a percentage of admitted assets (12/31/90):

Bonds	54%	(40% of long-term bonds were of below investment grade; the average maturity of the entire bond portfolio was 7 years)
Stocks	1%	
Mortgages	1%	
Real estate	0.1%	
Short term	39%	

Other 1986-1990 statutory financial data (amounts shown in \$thousands):

Year	Admitted Assets	Capital and Surplus (C&S) [†]	Surplus Ratio [†]	Net Gain from Operations [‡]	Common Stock & Real Estate as % of C&S
1986	\$393,109	\$30,517	7.8%	\$7,102	33.2%
1987	1,214,169	39,809	3.3	7,979	21.6
1988	2,318,542	67,059	2.9	18,643	42.9
1989	3,568,614	74,285	2.1	14,588	45.3
1990	4,069,081	121,985	3.0	33,416	22.4

*Includes a \$50 million surplus note assumed in the 1985 acquisition of the company.

†Capital and surplus as a percentage of admitted assets.

Apparent strategic deficiencies: Limited diversification by line of business, reliance on surplus notes rather than equity capital, and affiliation with another highly leveraged company also heavily investing in non-investment-grade bonds with rapid growth in interest-sensitive business.

¹Defined as asset problems with an insurer's own investments, whereby a significant decline in market value, large holdings of inappropriate or unauthorized assets, or lack of asset diversification results in financial impairment.

TABLE 3—*Continued*

General Accounting Office commentary on reasons for company failure: In congressional testimony concerning the failures of Executive Life Insurance Company, First Executive Life Insurance Company of New York, First Capital Life Insurance Company, and Fidelity Bankers, Richard Fogel, Assistant Comptroller General, observed in concluding his remarks that the growth of these companies was supported by questionable business strategies and noted their reliance on surplus notes, questionable financial reinsurance transactions, and investments in high risk assets.

News media commentary on reasons for company failure: The May 14, 1991 *Los Angeles Times* reported that the company had been seized by Virginia state regulators, quoting regulators as saying the company was fundamentally sound, but because of the California regulator's intervention with its sister company, First Capital Life Insurance Company, policyholders seeking to cash out their policies might cause it to run out of cash.

Cause(s) of Failure

While the Best study placement of this company's primary cause of failure in its overstated asset category (particularly with regard to its investments in below-investment-grade bonds) is appropriate, another important cause was too-rapid growth relative to available capital and surplus.

Potential Value of DST

Timeliness

At year-end 1986, the company had a 7.8% surplus ratio and reported earnings representing a return on equity of 23.4%. The data available do not suggest it was too late then to take advantage of DST in planning actions necessary to ensure its continued financial health.

Resource Constraints

As a member of the First Capital Holdings Group including First Capital Life Insurance Company—a company with several billion dollars in assets—this company was by far the best-resourced of those studied. However, though not constrained by resources from performing DST, it probably would have been difficult at year-end 1986 for management to have viewed allocating resources to DST as worthwhile.

Validity of Assumptions

While ideally DST would have been done for the parent company's insurance operations as a whole, this study has not investigated Fidelity Bankers affiliates. The conclusion drawn assumes DST was performed for Fidelity Bankers alone. Although what might at year-end 1986 have been seen as plausible stress scenarios regarding the deterioration in non-investment-grade bond values, the company's new business and asset growth, and policyholder withdrawals could have produced results much more favorable than those actually experienced, it is reasonable to expect that they would have signaled potential liquidity problems. Had DST been done for the parent's insurance operations as a whole, the modeled threat of liquidity problems might have been more pronounced.

Relevance

Had DST been done as of year-end 1986, expected results would have included signals pointing to future liquidity problems over the 1986–1991 interval and would thus have been related to the company's identified cause of failure. It is less clear whether the fall-off in surplus ratios would have been well-signalized, if only because the extremely rapid growth in assets (increasing more than tenfold between 1986 and 1990) would have been very difficult to credibly forecast.

TABLE 3—Continued

Addition to Other Information

The company's concentration in interest-sensitive markets with potentially volatile policyholder withdrawal rates, combined with its aggressive pursuit of new business and asset growth and relatively modest capital to support that growth, was a distinctly high-risk strategy. The risk that this strategy would lead to failure was not sufficiently clear from the other information available. DST would have provided valuable additional information to help the company judge that risk and prevent its failure.

Overall Conclusion

This company should be classified as one for which (as measured in this study) DST would have had a significant potential role in preventing its failure.

TABLE 4
INTER-AMERICAN LIFE INSURANCE COMPANY OF ILLINOIS

Company Data	
Date of regulatory intervention: December 23, 1991	
Note: This reflects the date of action by the Illinois Insurance Department; a July 20, 1991 article in <i>The Los Angeles Times</i> reported that California's Insurance Commissioner had ordered the company to cease writing business because of a number of objected-to financial transactions. These were described as: collateralization of a \$2.3 million loan to the company's parent, listing of a non-admissible property asset, a complex reinsurance agreement, and the sale and repurchase of an interest in a high-risk securities partnership that inflated the value of the investment.	
Best study primary cause category: Overstated assets ¹	
A.M. Best ratings:	
3 years before financial impairment	B
2 years prior	B
1 year prior	B-
At time of impairment	NA-9
Domicile: Illinois	
Formation/ownership: Formed in 1950 as Old Equity Life; various owners until mutualized in 1980; demutualized and acquired as a stock company in 1984 with its name changed to Inter-American Life Insurance Company of Illinois by a subsidiary of Beaven/Inter-American Companies, Inc.	
Territory: 44 states and the District of Columbia	
Lines of business: Individual and group life and annuities, group accident and health, with most recent emphasis on life and annuity products for employee benefit markets	
Distribution of selected assets by asset type as a percentage of admitted assets (12/31/90):	
Separate Account	2%
General Account	
Bonds	26% (18% of long-term portfolio of non-investment grade; average maturity, 12 years)
Stocks	8% (affiliated common stock held at 111% of capital and surplus)
Mortgages	23%
Real estate	4% (carried at 99.1% of cost)
Short term	6%
Note: Medium or lower quality bonds and delinquent or in-process-of-foreclosure mortgages represented 171% of capital and surplus at year-end 1990.	

¹Defined as asset problems with an insurer's own investments, whereby a significant decline in market value, large holdings of inappropriate or unauthorized assets, or lack of asset diversification results in financial impairment.

TABLE 4--Continued

Other 1986-1990 statutory financial data (amounts shown in thousands of dollars):

Year	Admitted Assets	Capital and Surplus (C&S)*	Surplus Ratio†	Net Gain from Operations	Common Stock and Real Estate as % of C&S
1986	\$54,811	\$12,075	22.0%	\$110	15.2%
1987	69,036	11,488	16.6	418	16.8
1988	112,668	11,663	10.4	200	29.8
1989	135,199	11,385	8.4	467	65.7
1990	139,567	7,001	5.0	349	189.8

*The exceptionally high \$4.4-million drop in C&S from 1989 to 1990 is the result of a \$1.5-million group annuity reserve upward revaluation, capital losses of \$1.2 million, and a \$2.6 million loss on non-admitted items (\$2.3 million related to amounts receivable from parent, subsidiaries and affiliates), offset by the net gain from operations and other smaller items.

†Capital and surplus as a percentage of admitted assets.

Apparent strategic deficiencies: Aggressive accounting practices, as suggested by the California Insurance Department action reported in the July 20, 1991, *Los Angeles Times* article cited previously.

News media commentary on reasons for company failure: The December 23, 1991 issue of *Crain's Chicago Business* reported that the Illinois Insurance Department would move on that date to liquidate the company, quoting the Insurance Department as saying the company was believed to be insolvent. The article notes as causes the declining values in its real estate and bond holdings, including bonds issued by Executive Life Insurance Company.

Cause(s) of Failure

The Best study placement of this company's primary cause of failure in its overstated asset category (particularly with regard to its investments in below-investment-grade bonds and commercial mortgages) is appropriate. Statutory losses on both group and individual annuity business primarily account for the modest total earnings, also contributing to its financial weakness and ultimate failure.

Potential Value of DST

Timeliness

The company entered 1987 with a 22% surplus ratio after reporting 1986 earnings severely weakened by a \$2.5-million loss from its group annuity business. The data available do not suggest it was too late then to take advantage of DST in planning actions necessary to ensure its continued financial health.

Resource Constraints

Having just reported group annuity losses equal to more than 20% of its current capital and surplus, allocating resources for financial analysis to determine changes needed in its practices to address the threat of continuing losses should have been seen as worthwhile, despite the company's modest size and limited resources to perform such analysis.

TABLE 4—*Continued*

Validity of Assumptions

The company was a member of a group of life insurers owned by the same parent. Ideally, DST would have been performed for the insurance operations of the parent as a whole. This study has not investigated the company's affiliates and the conclusion drawn assumes DST was performed for Inter-American Life Insurance Company of Illinois alone.

While obtaining reliable company-specific experience data would have been difficult for this company, it probably could have developed assumptions using adjustments to data from other sources that (after testing to assure the approximate replication of prior year aggregate results) could serve as valid baseline assumptions for all but amounts of new business to be written. Although new business and asset growth plausibly modeled by DST might have been lower than that experienced, 1986 DST results would probably have signaled threats of declining surplus ratios and liquidity problems.

Relevance

Had DST been done as of year-end 1986, expected results would have included signals pointing to the threat of diminishing surplus ratios and future liquidity problems over the 1986–1991 interval, both related to the company's major causes of failure.

Addition to Other Information

Despite the difficulties that would have been faced in performing DST, it could have been performed and would have thrown off relevant signals about potential future financial difficulties that would have added valuable information.

Overall Conclusion

This company should be classified as one for which (as measured in this study) DST would have had a significant potential role in preventing its failure.

TABLE 5
LEGACY LIFE INSURANCE COMPANY

Company Data	
Date of regulatory intervention: August 26, 1991	
Best study primary cause category: Inadequate pricing/surplus	
A.M. Best ratings:	
3 years before financial impairment	B
2 years prior	B-
1 year prior	NA-7
At time of impairment	NA-7
Domicile: Nebraska	
Formation/ownership: Formed in 1950 as Union Casualty Company; acquired by Ellsworth Financial Corporation in 1986, with the company's name changed to Legacy Life Insurance Company.	
Territory: Licensed in 25 states with business concentrated in Nebraska, North and South Dakota, Missouri, and Iowa	
Lines of business: Historically, primarily individual health; expanded to individual life coverages in 1987.	
Distribution of selected assets by asset type as a percentage of admitted assets (12/31/90):	
Bonds	33% (all long-term bonds were of investment grade; average maturity, 14 years)
Stocks	2%
Mortgages	11%
Real estate	24% (carried at 98.7% of cost)
Short term	0.1%

Other 1986-1990 statutory financial data (amounts shown in thousands of dollars):

Year	Admitted Assets	Capital and Surplus (C&S)	Surplus Ratio*	Net Gain from Operations*	Common Stock and Real Estate as % of C&S	Accident and Health Combined Ratio
1986	\$7,491	\$4,198	56.0%	\$889	24.8%	97.2%
1987	6,210	3,491	56.2	403	33.4	102.7
1988	14,653	3,119	21.3	1	95.4	127.0
1989	14,700	2,218	15.1	(2,944)	150.9	133.7
1990	10,407	1,000	9.6	249	262.0	108.2

*Capital and surplus as a percentage of admitted assets.

Apparent strategic deficiencies: Limited diversification by lines of business, constraints on access to capital.

News media commentary on reasons for company failure: *Business Wire*, reporting on September 17, 1991, wrote of the California Insurance Department placing the company in conservatorship after it had been conserved by Nebraska regulators. The article notes the Nebraska action occurred because the company fell below minimum capital and surplus requirements. It also noted that its parent company, Ellsworth Financial Corporation, was bankrupt and unable to contribute capital to its subsidiary.

TABLE 5—*Continued*

Cause(s) of Failure
The Best study placement of this company's primary cause of failure in its inadequate pricing/surplus category (particularly with respect to its individual health insurance pricing) appears appropriate.
Potential Value of DST
<i>Timeliness</i>
With an exceptionally high surplus ratio and strong 1986 earnings (return on equity was 27%), the company entered 1987 with good prospects for continued survival. Although its problems with health insurance business earnings were the major cause of its failure, these were not clearly evident at that time. Its individual health insurance business contributed nearly all (97%) of its 1986 earnings. The data available do not suggest it was too late then to take advantage of DST in planning actions necessary to ensure its continued financial health.
<i>Resource Constraints</i>
It would probably have been extremely difficult to persuade this company's management to make the needed investment to perform DST at year-end 1986. Given the concentration of its business in the individual health line, the company would, as in the case of Atlantic & Pacific Life Insurance Company of America discussed previously, probably have chosen something well short of DST as defined in this study to carry out that analysis. That might have, for example, taken the form of combining projections of gains or losses from existing blocks of health insurance with new health business projections using current pricing assumptions, with no modeling of other lines of business and ignoring or using current aggregate investment returns. If there were changes needed in any of the company's health insurance product design, pricing, underwriting, or marketing practices, this more limited analysis should have served to reveal such needs.
<i>Validity of Assumptions</i>
Obtaining reliable company-specific experience data would have been difficult for this company. Nevertheless, it should have been possible to develop assumptions employing adjustments to data from other sources that (after testing to assure the approximate replication of prior year aggregate results) could serve as valid baseline assumptions for all but amounts of new business to be written. Validly modeling new business would perhaps have been the greatest difficulty: 1987 accident and health net premiums written were about 80% of those for 1986, in 1988 they were over 200%. The 1988 explosion in sales appears to have been a major driver in the sharp 1987-1988 fall-off in surplus ratios. In 1989, the company experienced a \$4.4 million loss from its individual health business, the only significant loss from any line of business in any year over the 1986-1990 interval. It seems unlikely that DST as of year-end 1986 would have signaled the falling surplus ratios experienced. However, with a nearer-to-hand view of possible sales activity, DST performed as of year-end 1987 might have signaled the 1987-1988 falloff. It also can be argued that conventional business planning for 1988 performed in 1987 might have provided a reasonably clear view of this, without undertaking DST as defined for this study.

TABLE 5—Continued

Relevance

Had DST been done as of year-end 1986, it is, as discussed under Validity of Assumptions, questionable whether it would have signaled the declining surplus ratios experienced. Although 1987 year-end DST analysis might have shown the 1987–1988 surplus ratio fall-off, the need for DST to identify this problem at that point is also questioned. While a 1987 year-end or later performance of DST might have predicted something akin to the large single-year individual health insurance loss in 1989, if it were predictable at all, a full-scale DST analysis should not have been needed to predict it. The other signal used in our test for relevance—possible liquidity problems—was not identified as a factor in the company's failure.

Addition to Other Information

The need for changes in company practice that DST might have made evident could have been adequately established through other less elaborate financial analysis such as that suggested under Resource Constraints.

Overall Conclusion

This company should not be classified as one for which (as measured in this study) DST would have had a significant potential role in preventing its failure. The relevance of DST testing in this case is questioned and much less elaborate financial analysis could have adequately signaled the need for corrective actions.

TABLE 6
 OLD SOUTHERN LIFE INSURANCE COMPANY

Company Data

Date of regulatory intervention: July 22, 1991

Best study primary cause category: Inadequate pricing/surplus

A.M. Best ratings:

3 years before financial impairment	C+c
2 years prior	NA-7
1 year prior	NA-7
At time of impairment	NA-7

Domicile: Alabama

Formation/ownership: Formed in 1956; 30% interest in the company held by members of the Epperson family; Mr. Epperson was chairman (emeritus)

Territory: Licensed in Alabama, Florida, Louisiana, and Mississippi

Lines of business: Primarily individual health (mainly Medicare supplement and nursing home care)

Distribution of selected assets by asset type as a percentage of admitted assets (12/31/90):

Bonds	30% (over 94% of long-term bonds were of investment grade; average maturity, 14 years)
Stocks	27% (a single affiliate investment carried at \$6.3 million and costing \$2.6 million represented over 218% of capital and surplus)
Mortgages	17%
Real estate	15% (carried at 96% of cost; home office carried at 68% of capital and surplus)

Other 1986-1990 statutory financial data (amounts shown in thousands of dollars):

Year	Admitted Assets	Capital and Surplus (C&S)	Surplus Ratio*	Net Gain from Operations	Common Stock and Real Estate as % of C&S	Accident and Health Combined Ratio
1986	\$22,588	\$6,260	27.7%	(\$980)	95.2%	106.7%
1987	25,672	4,285	16.7	(2,492)	146.1	120.0
1988	28,106	5,725	20.4	(103)	146.1	105.2
1989	26,790	4,624	17.3	(1,495)	220.9	107.3
1990	24,477	2,885	11.8	(2,388)	341.9	120.1

*Capital and surplus as a percentage of admitted assets.

Apparent strategic deficiencies: Concentration in a single line of business

News media commentary on reasons for company failure: The August 1, 1991 *Orlando Sentinel Tribune* reported the company's receivership, noting it was insolvent.

TABLE 6--*Continued*

Cause(s) of Failure

The Best study placement of this company's primary cause of failure in its inadequate pricing/surplus category (particularly with respect to its individual health insurance pricing) appears appropriate.

Potential Value of DST

Timeliness

At year-end 1986, the company held a C+e ("Fairly Good") A.M. Best rating and reported a surplus ratio of 27.7%. Its 1986 statutory loss represented 23% of its 1995 year-end capital and surplus. While not immediately threatened with failure, it was clearly headed for trouble at that point.

Resource Constraints

Since nearly 180% of its 1986 losses came from its individual health insurance business and a continuation of such losses threatened its survival, investing in financial analysis to understand the changes needed in its health insurance product design, pricing, underwriting and marketing should have been seen as worthwhile, unless the need for such changes was already known to be necessary and management was unwilling or unable to make them. Given the concentration of its business in the individual health line, the company would, as in the cases of the other two small health carriers studied (Atlantic & Pacific Life Insurance Company of America and Legacy Life Insurance Company), probably have chosen something well short of DST as defined in this study to carry out that analysis. That might have, for example, taken the form of combining projections of gains or losses from existing blocks of health insurance with new health business projections using current pricing assumptions, with no modeling of other lines of business and ignoring or using current aggregate investment returns.

Validity of Assumptions

Obtaining reliable company-specific experience data would have been difficult for this company. It should, nevertheless, have been possible to develop assumptions employing adjustments to data from other sources that (after testing to assure the approximate replication of prior year aggregate results) could serve as valid baseline assumptions for all but amounts of new business to be written. Although health insurance premium growth was fairly rapid, with net health premiums written increasing by over 80% from 1986 to 1989, DST scenarios likely to have been examined would probably have included sufficiently rapid growth to signal significant continuing individual health insurance losses and the need for corrective actions.

Relevance

Had DST been done as of year-end 1986, expected results would have shown continuing health insurance business losses producing significant fall-offs in surplus ratios and would thus have provided useful signals related to the company's major cause of failure.

Addition to Other Information

Although DST would have provided relevant additional information, the need for changes in company practice that DST might have made evident could have been adequately established through other less elaborate financial analysis such as that suggested under Resource Constraints.

Overall Conclusion

This company should not be classified as one for which (as measured in this study) DST would have had a significant potential role in preventing its failure. Much less elaborate financial analysis could have adequately signaled the need for corrective actions.

III. SUGGESTIONS FOR FURTHER STUDY

For DST to provide significant value in preventing insurer failures, warning signals from the testing results need to be available before the company is faced with intractable difficulties. Ideally, DST would provide warning signals before a company's risk-based capital (RBC) ratios, as defined by the NAIC, trigger regulatory attention. For selected companies, it might be possible to compute RBC ratios for prior years, as if current requirements had existed in those years. Then analyses could be performed to assess whether DST would have given warning signals in years prior to the first year that regulatory attention would have been triggered by RBC ratios.

If, for such companies, retrospective modeling were performed prior to the point at which RBC ratios would have first triggered regulatory attention (the "testing point"), reflecting the actual subsequent new business activity, together with (to the extent possible) the other assumptions that might reasonably have been employed if DST had actually been performed at the "testing point," then the testing results could be compared with the actual results. Such a test of DST would be incomplete, of course, because the new business and other assumptions that might have been made are unknowable. However, if the comparisons indicated that such modeled DST would have shown that the companies were headed for failure if they remained on the same course, this would lend further support to viewing DST as potentially valuable in preventing insurer failure.

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ACKNOWLEDGMENTS

The author would like to thank the following people for lending their guidance and support in the preparation of this report:

Society of Actuaries Committee on Financial and Investment Management
Research

Roger W. Smith, F.S.A., Chairperson

Nicholas Bauer, F.S.A., F.C.I.A.

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APPENDIX A

SELECTION OF COMPANIES STUDIED

The selection process began with examining A.M. Best's June 1992 Special Report, "Best's Insolvency Study, Life/Health Insurers, 1976-1991" (Best study). This study identifies 290 life/health insurance companies—domiciled in the U.S., the District of Columbia, and Puerto Rico—that were known to A.M. Best to have become insolvent or financially impaired from 1976 through 1991.

The Best study specifies the criteria for the insolvent or financially impaired companies to be included in detail. Company types excluded were Blue Cross/Blue Shield organizations, managed care companies, third-party administrators, self-insurers, fraternal, and burial associations. The dating of financial impairment was based on the date of the first official action taken by the insurance department in the companies' respective states of domicile and included any state action restricting a company's ability to conduct business normally. Voluntary liquidations and confidential state actions were excluded.

The study emphasizes that a financially impaired company may not have been technically insolvent. It notes that such a company's surplus may have been deemed inadequate, or there might have been concern about the company's general financial condition.

The data supplied for each of the companies reported upon were as follows:

- a. Company name
- b. State of domicile
- c. Year of financial impairment
- d. Primary cause of financial impairment
- e. Best ratings at the time of impairment and 1, 2, and 3 years prior.

The companies included were classified by the following primary-cause-of-impairment categories:

- a. Overstated assets¹
- b. Rapid growth
- c. Affiliate problems

¹Defined as asset problems with an insurer's own investments, whereby a significant decline in market value, large holdings of inappropriate or unauthorized assets, or lack of asset diversification results in financial impairment.

- d. Inadequate pricing/surplus²
- e. Alleged fraud
- f. Significant change in business
- g. Reinsurer failure
- h. Miscellaneous
- i. Unidentified.

The group to be considered for the present study was narrowed by selecting those identified as impaired primarily because of inadequate pricing/surplus or overstated assets. The group was further limited to those with A.M. Best ratings at the time of impairment, or one to three years prior, other than NA-1, NA-2, NA-3, NA-4, or not followed by A.M. Best (see Appendix B for definitions of these rating symbols). Precedence was given to those most recently impaired. The primary cause categories selected were chosen as representing those expected to yield companies that might potentially have had the greatest benefit from DST. (Those in the rapid growth category might have been added if needed to obtain the six companies required.)

Following this process and confining it to companies impaired in 1991 yielded the following list of seven companies (Executive Life Insurance Company, Executive Life Insurance Company of New York, and The Mutual Benefit Life Insurance Company were excluded from the group to be studied, as requested by the SOA Committee on Financial and Investment Management Research):

- a. American Financial Life Insurance Company
- b. Atlantic & Pacific Life Insurance Company of America
- c. Fidelity Bankers Life Insurance Company
- d. First Capital Life Insurance Company
- e. Inter-American Insurance Company of Illinois
- f. Legacy Life Insurance Company
- g. Old Southern Life Insurance Company.

Fidelity Bankers Life Insurance Company and First Capital Life Insurance Company were affiliates at the time of their impairment, so only one,

²Defined as companies underpricing their product, leading to significant operating losses and financial hardship. The Best study notes that two-thirds of the financially impaired companies in this category were accident and health (A&H) carriers; it points out that these failures typically were near or shortly following A&H cycle troughs.

Fidelity Bankers Life Insurance Company, was selected, leaving six companies. The six are all stock life/health insurers. Three were classified in the Best study as primarily impaired because of inadequate pricing/surplus and three because of overstated assets.

APPENDIX B

A.M. BEST RATING SYMBOLS

<i>Symbol</i>	<i>Rating Category</i>
A+	Superior
A, A-	Excellent
B+	Very good
B, B-	Good
C+	Fairly good
C, C-	Fair
NA-1	Special data filing; used primarily for companies exempt from filing the standard NAIC annual statement
NA-2	Less than minimum size
NA-3	Insufficient operating experience
NA-4	Rating procedure inapplicable
NA-5	Significant change
NA-6	Reinsured by unrated reinsurer
NA-7	Below minimum standards
NA-8	Incomplete financial information
NA-9	Company requested that rating not be published
NA-10	Under state supervision

Note: The performance modifier symbol "c" following a rating notes that the rating is contingent, reflecting a modest decline in the company's current financial performance that does not warrant a change in the assigned rating.

