



TOWERS  
PERRIN

TILLINGHAST

# TRACS: The Road to Successful Captive Management

Tillinghast Recognized and Accepted Captive Standards

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## INTRODUCTION

Captives are created to serve their owner-policyholders. Traditional insurance solvency and ratio standards may not apply to them. TRACS was developed by the Tillinghast business of Towers Perrin to help you prudently manage and benchmark your captive operation.

TRACS is not intended to create a strict “pass/fail” result since specific benchmarks and standards may not be appropriate for all captives. When applying TRACS to a specific captive, you should consider that many captive insurance companies are unique. Practical considerations may be more important than adherence to an overall set of standards. For example, a captive (and its owner) may be forced to retain more risk than prudently advisable because no commercial insurance alternative is available or

because the cost of commercial insurance or reinsurance is prohibitive.

A captive’s value to its owners depends on how well it meets its goals. For example, a cost-centered captive is focused on reducing the cost of risk and using minimal financial resources, while the purpose of a profit-centered captive is to add wealth to the organization through arbitrage and tax planning. Other captives might be used to stabilize earnings, offer nontraditional products or shift wealth to a more tax-efficient mechanism.

In this monograph, we concentrate on the captive as a special-purpose vehicle for insuring and retaining the risk of its owners. Whenever a captive steps outside of its core captive business — to participate in pools or to write unrelated business — its financial performance should be measured more closely to traditional insurance company stan-

dards. We assume that the typical captive’s purpose is to provide a cost-efficient risk financing program, enhance the risk management process and maintain reasonable financial resources to support its obligations.

Many insurance companies use key financial ratios to manage their business. TRACS is designed to measure the intrinsic risk of the captive, independent of benchmarks based on key financial ratios. However, as a point of reference we also provide our view on applicable key financial ratios.

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## OPERATIONAL EXCELLENCE

Surplus adequacy is the single-most important captive standard or test. The amount of assets supporting liabilities should reflect a level of confidence commensurate with risk and with the type of captive.

A captive insurance company has many definitions. For the purposes of TRACS, we define a captive as: *A closely held insurance company, controlled by its owners, offering insurance products to its owners as the principal policyholder beneficiaries.*

### TILLINGHAST RECOMMENDED AND ACCEPTED CAPTIVE STANDARDS

To evaluate the financial health of captives effectively, we propose the following standards:

- Capital management
- Loss reserve adequacy
- Prudent funding and risk management
- Investment policy and asset allocation.

### TRACS NO. 1: CAPITAL MANAGEMENT

The capital and surplus is the most critical of all measures of performance or adequacy for all insurance companies, including captives. Many captives are well capitalized — some are even over-capitalized. Captives that maintain low capital positions often have good reasons for maintaining lower levels. For example, some captives maintain significant margins in the loss reserve account — surplus by another name. Nonetheless, we believe that surplus adequacy is the single-most important captive standard or test. The amount of assets supporting liabilities should reflect a level of

confidence commensurate with risk and with the type of captive. Minimum level of surplus is the amount represented by a higher level of confidence, less the expected value of claims and investment income. The calculation should be made over a five-year planning horizon.

#### Capital Standards

- 95th percentile of ultimate losses (for group captives) or
- 75th percentile projected ultimate losses (for single-owner captives writing parent business exclusively)
- Less expected losses and anticipated investment income equals minimum captive surplus.

In presenting this test, we propose an alternative means of testing surplus adequacy. Instead of traditional premium-to-surplus or loss reserve-to-surplus ratio, as described earlier, this method recognizes the unique characteristics of a captive — size, business mix, attachments and limit profile. It also reflects the risk arising from the investment portfolio. Traditional ratios do not take these differences among captive companies into account.

Our approach uses a model of the probability of ruin and a two-step process. First, determine the amount of assets, including their anticipated performance, required to finance the 95% confidence for a group

captive and 75% confidence for a single-owner “pure” captive. Conduct this analysis for a five-year planning horizon. Second, subtract the actual reserve position from this amount to determine the minimum surplus.

The approach would build a complete financial model for the captive — in the same way you would build a five-year pro forma financial statement for the balance sheet, income statement and cash flow statement. The financial model would then simulate key variables such as the:

- Amount of claims
- Timing of claim payments
- Performance of assets.

The model would perform enough simulations to generate significant adverse scenarios of financial results, depending on the exposures, with a certain degree of probability. The results would then be used to determine the amount of surplus required to finance a higher level of confidence.

We also suggest that captives develop a capital management policy statement. In view of Sarbanes-Oxley, this statement may help to maintain a financially solvent position, especially during times of stress. The statement also establishes a rational approach toward capital management that can be reflected upon when operating performance is higher or lower than anti-

pated. An illustrative statement would have the components outlined below:

### Objectives of a Capital Management Policy Statement

- Capital should be sufficient to support a predetermined growth in premium. This growth could come from the addition of new members or new coverages.
- The reserve position should maintain a high confidence level, as determined by an appointed actuary.
- Dividends to members should be maintained as an ongoing policy.
- Capital and retained earnings should position the captive to raise the limits of liability or retention of the program, if needed.

### Constraints of a Capital Management Policy Statement

- *Key performance indicators*
  - Premium to surplus — no higher than 1.50
  - Reserves to surplus — no higher than 3.50
  - Surplus to liability retention — no less than 10
- *Risk-based capital (RBC)* — Minimum capital position based on an RBC capital adequacy model from A.M. Best, S&P or some other customized approach
- *Maintain excess capital to support liquidity*
  - Dividends of no less than a prescribed value annually

- Adverse calendar-year claim payments equal to 50% above normal
- Ability to pay up at least two fully retained limits claims

- *Regulatory* — Maintain a solvent position that is closely aligned with the requirements imposed by regulators
- *Insurance rating agency* — Maintain a solvent position that is closely aligned with an A.M. Best rating of A- or better
- *Governance and control* — Comply with member agreements, articles of association and bylaws as appropriate.

### TRACS NO. 2: LOSS RESERVE ADEQUACY

On average, nearly 70% of a commercial insurance company's liabilities pertain to loss and loss expense reserves; for most captive insurance companies the average is 90% to 95%. An error in the loss reserve estimates can materially impact a company's key financial ratios. Therefore, it is imperative that loss reserves meet certain minimum reasonableness tests *before* any key financial ratios are calculated or compared to industry benchmarks.

The best way to test for adequacy is to call in a qualified actuary. The standard we propose is that the captive's loss reserves be within 5% of a qualified actuary's best estimate of reserves. In addition, any difference between the

captive's loss reserves and the actuary's best estimate should be less than 10% of surplus.

*Adequate Loss Reserves:* Adequate means within 5% of the expected value of unpaid liabilities developed by standard actuarial procedures, with the difference to be less than 10% of surplus.

By adhering to TRACS of minimum surplus and reserve adequacy, captive insurance companies will be in a position to demonstrate that they can fulfill their promised obligations, as well as bear reasonable risk without fear of insolvency. We emphasize that these tests apply to any insurance entity, whether a captive or a commercial insurance carrier. Companies that adhere to these standards are the ones that survive “down” cycles.

### TRACS NO. 3: PRUDENT FUNDING AND RISK MANAGEMENT

Each captive must generate a sufficient amount of revenue to support the operating expenses and losses incurred by the company. A captive has two primary sources of revenue: premium and investment income. Generally, premium income is significantly more than investment income, although the relationship varies substantially by line of insurance. Captives that write primarily long-tail liability business will likely generate more investment income than captives that write primarily short-tail property business.

Finite risk transfer programs also include excess of loss and aggregate stop loss programs, but the amount of risk transfer is limited. Finite risk transfer programs help to spread risk over the course of time. They also can be a lower-cost program should claim experience be significantly lower than anticipated.

*Prudent Funding:* Revenues (premium plus investment income) must be more than sufficient to cover expenses and the present value of expected losses.

Premiums should contain a provision for the expected operating and underwriting expenses of the captive. Operating expenses include such items as general management and administration, and applicable premium tax, audit, actuarial and legal services. Reinsurance premiums may also be a significant component of operating expenses. Underwriting expenses include the present value of claims and claim handling expenses. “Claim handling expenses” refers to the cost of adjusting claims and other internal claim management costs.

The expected value of claims reflects both indemnity and defense retained by the captive. Generally accepted actuarial techniques should be used to project the expected value of claims as well as the expected cash flow pattern for claims. A present value estimate of claims can be determined by discounting the expected cash flow of claims using an appropriate discount rate that reflects the maturity of the cash flow pattern and current financial market conditions. We suggest the use of a high investment grade vehicle such as a Treasury bond or AAA corporate bond as the basis for annual discount rates.

“Sufficient” is a key word in our standard for prudent funding. In the context of this standard, the word “sufficient” implies “more than enough.” Since the actual value of claims is generally a moving target until claims are settled, it is likely that the projected expected value of claims may be too low. Our approach is to determine a premium that will be more than enough to fund expenses and claims. Therefore, it would be appropriate to include a margin for the risk of adverse deviations in claim experience.

Some would argue that including a margin for risk in the determination of premium is redundant and overlaps with the buffer provided by the surplus of the captive. This may be true to a point, but as surplus erodes, it must be replaced to satisfy the minimum surplus level of TRACS. An actuarial pricing axiom states that, over the course of time, premiums based on expected value pricing will eventually lead to insolvency.

A corollary to prudent funding is managing the overall volatility and exposure to claims. Sometimes, using premiums and capital to manage the risk of adverse experience is too expensive. Captives should consider using commercial reinsurance as an alternative source of funding.

We segregate reinsurance programs into two groups — traditional risk transfer and finite risk transfer. Traditional

risk transfer programs include excess of loss and aggregate stop loss programs. These programs transfer a significant amount of risk. Typically, once the premium is paid, there are no assessments or return premiums.

Finite risk transfer programs also include excess of loss and aggregate stop loss programs, but the amount of risk transfer is limited. Finite risk transfer programs help to spread risk over the course of time. They also can be a lower-cost program should claim experience be significantly lower than anticipated. Additional premiums may be required if adverse experience emerges, but the amount of additional premium is limited.

Reinsurance can also be used creatively during soft market conditions. The low cost of reinsurance can be passed on to members, thereby lowering premiums. Rather than leave the captive for cheaper commercial market premiums, we suggest using the captive to access cheap reinsurance.

The use of reinsurance creates an additional credit risk to the captive. The default of a reinsurance program will become the burden of the captive members. We suggest that A- rated or better reinsurance carriers be used in a reinsurance program.

### TRACS NO. 4: INVESTMENT POLICY AND ASSET ALLOCATION

Captives tend to place little emphasis on investment policy and asset allocation relative to the emphasis placed on underwriting. This is understandable in view of the relative levels of risk. Nonetheless, a well-drafted investment policy, and associated asset allocation, will help to maintain a high level of financial integrity and clearly articulate the management of assets.

*Investment Policy Statement:*

- State objectives for total return and risk tolerance.
- Outline constraints relating to liquidity, taxes, time horizon, regulations and unique preference.

Total return objectives should consider a five-year outlook of economic conditions the margins (or lack thereof) in premiums and the need for current income. There are two main components to total return: capital appreciation and investment income. Generally, the capital appreciation component is more risky than the income component. Capital appreciation is usually required to meet future needs (such as long-tail claims); income is usually required to meet current needs (such as dividends or premium subsidies).

Risk tolerance focuses on capital volatility arising from deviation in anticipated results. Minimizing the risk of capital loss is synonymous with a low tolerance for risk. This position would place a high emphasis on preserving the capital base (see *Exhibit 1*).

### EXHIBIT 1 Objective Guidelines

Total Return Component	Emphasis of Total Return Component		Long-Term Return Expectation
	High Risk Tolerance	Low Risk Tolerance	
Capital appreciation	Emphasize	De-emphasize	6%-9%
Current income	De-emphasize	Emphasize	3%-5%

Your objectives must be tempered by your constraints. For example, you would not be able to invest funds in securities prohibited by law or regulation. Depending on circumstances, the constraints help to define your risk and return objectives or inhibit your objectives (see *Exhibit 2*).

### EXHIBIT 2 Investment Constraints

Liquidity	Maintain sufficient liquid assets to pay 12-24 months of obligations.
Taxes	Structure asset allocation to minimize exposure to taxes.
Time horizon	Be aware of the limits for the maturity of investments and the need for liquidity.
Legal and regulatory	Review domicile laws; beware of loan-backs when taking a tax deduction for premiums.
Unique preference	Investment grade constraints; consider social issues.

Non-life insurance companies have erratic cash flows for claims — especially for liability and property exposures. The ability to predict actual claim payments is hampered by the ability to predict what type of claims will occur. This characteristic leads to a high degree of liquidity required to meet obligations. Typical asset allocation for non-life operations is shown in *Exhibit 3*.

### EXHIBIT 3 Captive Asset Allocation Guideline

Fixed income	75%
Equities	20%
Other	5%

In general, the investment portfolio should be determined so that investments mature before claims are paid. The expected yield on new investments should be considered in determining a discount rate for present value calculations. Finally, investments should be reasonably liquid should these funds need to be accessed earlier than anticipated.

## KEY FACTORS FOR SUCCESS

A captive should be a long-term vehicle for stability rather than an emergency measure for short-term cost/coverage advantages.

A captive should be a long-term vehicle for stability rather than an emergency measure for short-term cost/coverage advantages. Success improves when members continue to buy coverage, or creatively use the captive, during soft market conditions. Twelve key success factors include the following.

### 1. LONG-TERM COMMITMENT

Members should commit to a program for at least three to five years.

The capital of departing members should be retained for at least three years and possibly forfeited for withdrawal within the first three to five years.

### 2. PRUDENT FUNDING

Assets must be available to cover the maximum probable loss faced by the captive. Capitalization may be in the form of cash, letters of credit or other reliable tender.

Reinsurance should be used to protect the company against a large single loss or accumulation of losses. Retained risk should be within prudent guidelines.

Group programs should maintain a high degree of confidence. We suggest 90%

confidence that revenues will exceed expenses and claims. Initial capital contribution should probably be equal to 30% of initial premium — which is reflective of a 90% confidence level.

Actuarial reserve and loss projections should be updated annually.

### 3. REDUCED EXPENSES

Captives can be less susceptible to market cycles than commercial insurers if they are able to “run lean.”

Renegotiation, elimination and reduction of service providers’ fees should be reviewed continuously and remain a high priority for the program. A cost-containment plan can help to reduce costs.

### 4. CAREFUL UNDERWRITING

Underwriting standards and process are the responsibility of the underwriting committee of the board.

The underwriting process ensures that adding new members is a benefit to the captive rather than a detriment. The rating method used should be simple, equitable and consistent. A process to expel members who consistently show themselves to be poor risks should be developed.

As the captive continues to grow and mature, greater underwriting authority and responsibility can and should be exercised by its underwriting committee.

### 5. RISK SHARING

It is important for captive members to agree that one member’s catastrophic loss will be borne, in part, by all of the members. While careful underwriting will ensure that over time each member’s premiums will cover its own expected losses, the extraordinary losses must be shared.

The underwriting committee should approve a risk sharing policy in accord with wishes of the board of directors.

### 6. RISK MANAGEMENT APPROACH

A heavy emphasis on risk control can help to reduce the total program cost. Training for adherence to loss control standards, inspection guidelines and rewards can be used by captives to heighten members’ awareness of risk management issues and thus lower losses.

A risk management information system assists management in focusing on critical exposure and loss areas.

The captive should emphasize the importance of local risk assessment and enhanced risk control with the active assistance of its service providers.

#### **7. HOMOGENEITY OF INTEREST**

Shared needs and interest lead to mutual understanding and clarity of focus. Too much diversity in member background can lead to dissension.

There should be appropriate board representation for members to ensure that small companies are as adequately represented as larger companies.

Consider offering retention levels that vary by size of member.

#### **8. SENSE OF URGENCY**

Most successful captives are created because of shared problems and a mutual sense of urgency in solving them.

Usually, this response is to a chaotic insurance market condition.

During the “softer” insurance market, a captive has to maintain its advantage through broader coverage and fair pricing.

#### **9. PROFIT ALLOCATION**

Profit sharing formulas will recognize individual loss experience, differences in premium size, number of years in the program and contribution to capital/surplus.

A plan for return of capital and distribution of surplus profits should be approved by the board.

Periodic returns of profits must be based on continued financial strength plus a long-term commitment to return excess funds.

#### **10. POLITICAL SUPPORT**

The captive must be a “winner” and must be perceived as such by the present and potential membership.

Key leaders from the membership must provide a high level of support and advocacy.

Endorsement by the members’ association can enhance political support.

The inherent mutual interest of all members is one of the program’s most valuable assets.

#### **11. CONCENTRATION AND TARGET RISK**

Manage the aggregation of risk or exposure to target risks (such as catastrophes, construction defect or terrorism) that could affect all members more or less simultaneously. Actuarial models may provide guidance in this area.

#### **12. ADEQUACY OF LIMITS/ AVAILABILITY OF REINSURANCE**

The program should provide limits that meet the needs of the members and should retain sufficient risk internally to establish financial credibility with reinsurers. If the plan relies heavily on the availability of reinsurance, relationships with reinsurers should be carefully fostered.

Over time, as surplus grows, consider increasing the retention as a way to reduce the captive’s reliance on reinsurers.

## FINANCIAL PERFORMANCE

Ratios determine how much risk is being retained relative to the financial resources available; profit ratios help determine whether the captive builds capital organically to support growth or requires “parental” support.

Rating agencies, regulators and other stakeholders have used quantitative analysis to gauge the financial performance and integrity of insurance operations. Our view is that several key financial measures are useful to gauge the ongoing health of a captive. These critical measures are described here.

### PREMIUM-TO-SURPLUS RATIO

This ratio is a general gauge of an insurer’s relative security and ability to take on risk. In the U.S., the National Association of Insurance Commissioners (NAIC) considers ratios over 2:1 to be dangerously high for commercial insurers. In Bermuda, the maximum for group captives is 5:1. A 90% confidence level could range from 1:1 to 5:1 depending on the volatility of exposures.

### RESERVES-TO-SURPLUS RATIO

This ratio measures how much the captive’s surplus and capital might be impaired if loss reserves are undervalued. For a mixed portfolio of business, a 3:1 ratio or lower is prudent. For low-frequency/high-severity exposures, a significantly lower ratio should be considered.

### RISK RETENTION RATIO

This is the ratio of the maximum per occurrence loss exposure retained by the captive to surplus. It provides a gauge of the potential effect of a maximum loss from a single event — the “risk factor.” For a group captive, a maximum of 10% of surplus is reasonable.

### EXPENSE RATIO

This is the ratio of non-loss expenses to captive written premiums. It is a measure of how much of each captive premium dollar goes to running the captive. For a captive program, this ratio should not exceed 25%.

### LOSS RATIO

This is the ratio of losses and loss adjustment expenses to captive earned premiums. This ratio gives the percentage of each dollar that goes to pay losses and related expenses. The loss ratio should range between 45% and 100% over a five-year period. Low frequency/ high-severity exposures may require a significantly lower ratio so that risk margin can be used to build the surplus position of the captive.

### COMBINED RATIO

This is the sum of the expense ratio and loss ratio. This figure provides a single useful figure for measuring the captive’s overall underwriting results, although it ignores investment income. Combined ratios should be less than 100%. Long-tail lines could support a ratio greater than 100%.

### POLICY YEAR OPERATING RATIO

This is the sum of expenses and present value of losses over sum of premium and investment income. It is a measure of overall performance, including the effects of investment income. This ratio should be less than 100%; otherwise, the captive is losing money.

### INVESTMENT INCOME RATIO

This is the ratio of net investment income to captive invested assets. It is a general measure of asset performance relative to invested assets. Most captives invest conservatively. This ratio should be in the range of 3% to 6%. Long-tail lines should have significantly higher ratios.

### KEY FINANCIAL RATIOS OF THE INSURANCE INDUSTRY

In this section, we provide ranges for key financial ratios for the insurance industry. We focus on five key financial ratios:

- Premium to capital and surplus
- Risk retention to surplus
- Loss reserves to surplus
- Trade or combined ratios
- Investment income ratio.

The first three are known as leverage ratios, which determine how much risk is being retained relative to the financial resources available. The last two are profit ratios, which help determine whether the captive builds capital organically to support growth or requires “parental” support.

Other ratios measure performance metrics such as liquidity, cash flow and credit risk. However, from a practical perspective, we will focus only on these five key financial ratios.

Changes in these key financial ratios over time are equally as important as the ratios for any one year. Regulators in particular jurisdictions or fronting companies using a captive as a reinsurer may require captives to adhere to conservative levels of these ratios. A key element is evaluating the risk and volatility of the captive’s exposures in relation to its financial resources.

Financial resources are categorized into two groups, direct and indirect. Direct resources include premium, capital and investment income. Indirect resources include finite reinsurance programs, parental guarantees and other off-balance-sheet resources.

### PREMIUM-TO-SURPLUS RATIO

Probably the most frequently used measure of financial strength is the premium-to-surplus ratio (see *Exhibit 4*). For U.S. insurance companies writing commercial lines, this ratio ranged from 0.87 in 1999 to 1.41 in 1992. At the end of 2002, it stood at 1.26. The relatively high ratio in 1992 is directly correlated with a peak in the hard market, while the relatively low ratio in 1999 is directly correlated with a trough in the soft market. The increase in the ratio since 1999 is a reflection of significant rate increases combined with reserve additions that reduced surplus positions.

Ironically, for the traditional insurance marketplace, a high premium-to-surplus ratio is usually correlated with a hard market. The profit provision in rates is high while the ratio appears to indicate a high leveraged position. Conversely, a low premium-to-surplus ratio is considered good, but is usually correlated with a soft market. The profit provision is low when the ratio appears to indicate a low leverage position. The use of a premium-to-surplus ratio as a measure of financial strength needs to reflect relative rate level adequacy.

There is no “correct” premium-to-surplus ratio benchmark for all insurance companies. In the NAIC’s Insurance Regulatory Information System (IRIS), an unusual value is one higher than 3.00. In Bermuda, by comparison, a Class 1 or 2

captive must maintain a premium-to-surplus ratio of less than 5.0 for premium up to \$6 million, and less than 10.0 for premium greater than \$6 million. The premium-to-surplus ratio also varies by the type of exposure — for example, excess versus primary layers.

Low values of premium-to-surplus ratios may indicate that the captive is overcapitalized. As we point out later, the ratio of risk retention to surplus should be considered. An important aspect of captives is that low premium-to-surplus ratios could be due to higher risk-to-surplus ratios (see *Exhibit 4*).

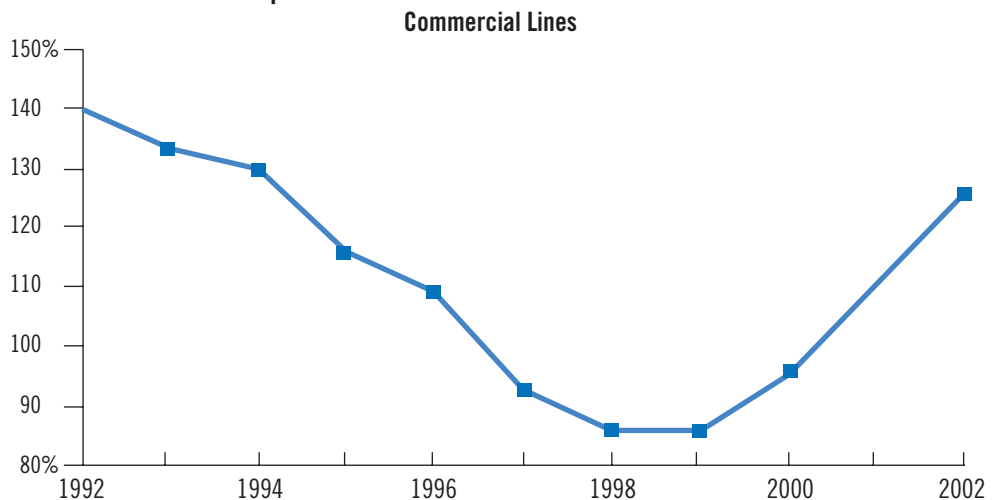
One problem with this ratio is that it does not distinguish between different kinds of companies or lines of insurance. For

example, the same premium-to-surplus benchmark cannot be applied to a writer of long-tail medical malpractice business and a writer of short-tail non-catastrophe property coverage.

Another problem is that this ratio penalizes rate or price increases. If premium rises materially as a result of rate increases, then the premium-to-surplus ratio will also rise. This rise could be viewed, naively, as additional risk and higher leverage when, in fact, higher profits in premium lead to lower risk and, eventually, lower leverage.

The proper benchmark for captives is obviously the one expressed officially or unofficially by the regulator of the domicile. This would imply 5:1 or 10:1 in Bermuda, 3:1 in some U.S. domiciles,

**EXHIBIT 4**  
**Ratio of Premium to Surplus**



Captives should be willing to take higher risks, as long as they recognize that additional contributions may be required to cover unfunded liabilities.

and over 10:1 in some offshore domiciles. TRACS range of “normal” ratios is shown in *Exhibit 5*.

#### EXHIBIT 5 TRACS Premium-to-Surplus Ratios

Long-tail casualty business (below \$10 million annual premium)	1:1 - 4:1
Short-tail casualty business (e.g., claims made)	2:1 - 5:1
Property-type coverages — non-CAT	2:1 - 5:1
Property-type coverages — CAT	Less than 1:1
Low-frequency, high-severity casualty (e.g., excess of loss)	2:1 - 5:1
High-frequency, low-severity losses (e.g., primary)	Up to 5:1

#### RISK RETENTION-TO-SURPLUS RATIO

There are two schools of thought on this ratio. The first, as contained in New York State’s insurance regulations, holds that an insurance company is not permitted to expose more than 10% of its surplus to any single loss or risk. In other words, the surplus position of the captive should be sufficient to finance 10 very large claims. Illinois and Colorado apply the “10% rule” to group captives. Many other U.S. domestic domiciles use this rule as a point of reference. To our knowledge,

no similar regulation exists in the offshore or European captive domiciles. Many captives, particularly group captives, are unwilling or unable to raise sufficient capital to meet this test.

The second school of thought holds that risk taking is an area in which captives differ from traditional insurers. Captives should be willing to take higher risks, as long as they recognize that additional contributions may be required to cover unfunded liabilities. In this scenario, the captive would operate under a higher-than-normal risk retention ratio (see *Exhibit 6*).

#### RESERVES-TO-SURPLUS RATIO

Another key measure of insurance company financial strength is the ratio of reserves to surplus. *Exhibit 7*, on page 11, shows that, for U.S. commercial line

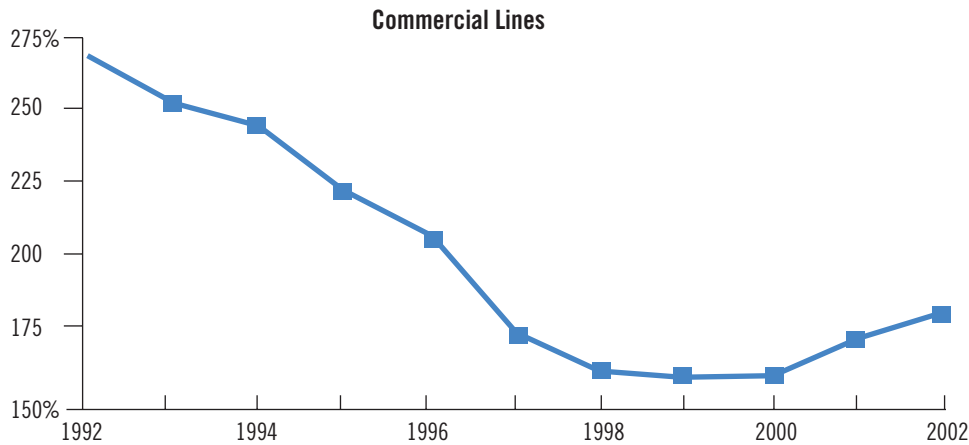
insurers, this ratio has decreased steadily from 269% in 1992 to 157% in 1999. This decrease is directly correlated to a shift from hard to soft market conditions.

As companies emerge from the hard market, reserve levels are set conservatively. These reserve levels are gradually reduced as prices soften. At the trough of the soft market, reserve levels are set optimistically, leading to unrealistic measures of profits and low reserve-to-surplus ratios. Once the trough is reached, companies begin to strengthen reserves. The cycle is completed during the entry into a hard market. Reserves are strengthened, which causes surplus to decrease, which causes the ratio to increase. Most recently, the traditional insurance industry added over \$30 billion to its reserve position in 2001 (\$10.8 billion) and 2002 (\$21.6 billion). This addition to reserve

#### EXHIBIT 6 TRACS Risk Retention-to-Surplus Ratio

Captive Type and Exposure	Retention-to-Surplus Ratio	Implied Surplus Requirement Based on \$500,000 Retention
Single-owner, non-casualty, non-catastrophe	200%	\$ 250,000
Single-owner, low-frequency casualty	Up to 100%	\$ 500,000
Group captive, small sophisticated membership, low-frequency casualty	Up to 50%	\$1,000,000
Group captive, small membership of midsize insureds	Up to 25%	\$2,000,000
Group captive, broad membership of small insureds	Up to 10%	\$5,000,000

**EXHIBIT 7**  
**Ratio of Reserve to Surplus**



positions raised the reserve-to-surplus ratio for the industry as it headed to the peak of a hard market.

The reserve-to-surplus ratio is important for captives because it measures the impact on a captive’s surplus position due to an inaccurate loss reserve position. For instance, if the reserve-to-surplus ratio is 6.0, a 10% undervaluing of the liability will reduce capital by 60% — a figure not at all uncommon these days. TRACS recommends the values shown in *Exhibit 8* as the approximate levels. At higher levels, the captive financial strength may reasonably be challenged.

Loss reserves may be hidden “off balance sheet” by means of traditional or finite reinsurance. A captive’s financial

performance as regards loss reserve adequacy also involves its dependence and credit risk arising from reinsurance. Thus all examinations of captive loss reserves should include amounts recoverable from reinsurance and the credit exposure to surplus.

**TRADE OR COMBINED RATIO**

A measure of success for an insurance company is the trade ratio, sometimes called the combined ratio. The trade ratio is the sum of the loss ratio (losses to earned premiums) and the expense ratio (expenses to written premiums). *Exhibit 9*, on page 12, depicts how the U.S. commercial line insurance company trade ratio has fared over the past 10

**EXHIBIT 8**  
**TRACS Loss Reserves-to-Surplus Ratio**

Long-tail casualty business	3:1
Short-tail business	5:1
Mixed portfolios (not predominantly one of the above)	4:1

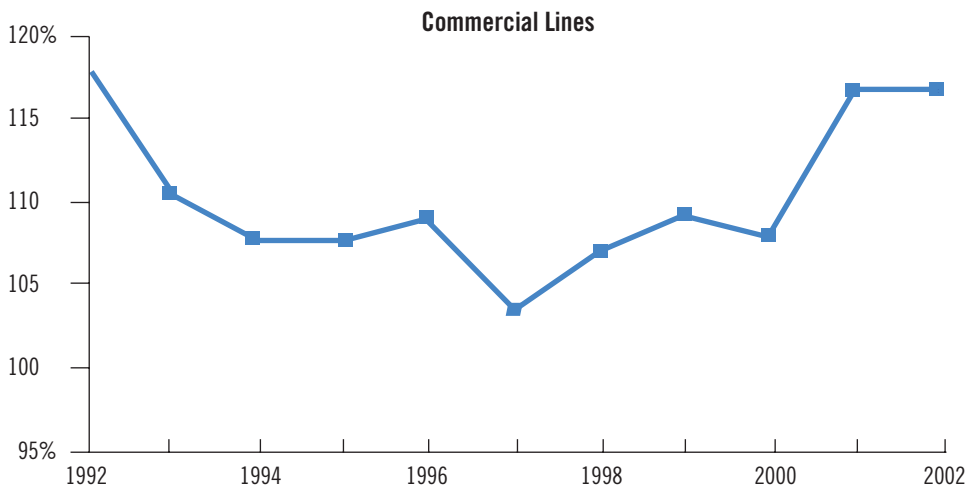
years. The trend in the trade ratio is directly correlated to the cycles in market prices. As the market emerged from a period of soft prices, rate increases led to a reduction in the trade ratio. As the market entered a period of soft prices, rate decreases led to an increase in the trade ratio.

TRACS recommends a long-term (five year minimum) benchmark trade ratio for captives at not more than 100% for short-tail writers and 110% for long-tail writers. This in turn can be broken down into an expense ratio of not more than 20% and a pure loss ratio of not more than 80% (100% for long-tail writers).

The performance of a trade ratio, however, is also affected by investment returns. Some insurance companies use sophisticated dynamic financial analysis (DFA) and return-on-equity (ROE) models to evaluate target rates of return. The ROE models are based on the anticipated cash flow of funds

Captive owners should use dynamic financial analysis models when balancing the trade-offs of risk transfer and risk retention.

**EXHIBIT 9**  
**Trade (Combined) Ratio of U.S. Companies**



and claims, the amount of funds and claims, and the volatility of claims. These DFA and ROE models determine a target trade ratio that achieves a specified return in relation to an estimate of the risk. Some captive owners have used similar models when balancing the trade-offs of risk transfer and risk retention.

The amount of investment income used to support liability obligations and subsidize premiums raises the trade ratio. Evaluating a trade ratio benchmark should include consideration of investment performance and volatility. A high trade ratio may be aligned with superior investment performance (see *Exhibit 10*).

Be aware of differing practices in captive accounting. When calculating the

expense ratio for captives, some captives deduct from expenses the commissions earned from ceding reinsurance outward. Others combine profit sharing commissions and other income with the expense figure before calculating the ratio. Varying treatment of certain expense items may make trade ratio comparisons between captives inappropriate.

**EXHIBIT 10**  
**TRACS Trade Ratio (Maximum)**

	Short Tail	Long Tail
Loss ratio	80%	90%
Expense ratio	20%	20%
Overall	100%	110%

**INVESTMENT INCOME RATIO**

This ratio compares net investment income to mean assets, which is one way to measure asset management performance. The ratio has been decreasing over the past 10 years as interest rates have declined (see *Exhibit 11*, page 13).

Most captives tend to invest conservatively. Some captives invest a portion of their assets in parent operations while others use non-invested assets, such as letters of credit. Captive managers should match asset maturities more carefully with liability payouts, especially as the discounting of loss reserves becomes more prevalent. Allocating a significant portion of assets to nonperforming investments, such as LOCs, implies that reserves for claims should not be discounted for the time value of money. These nonperforming assets supporting the liability do not generate investment income.

The benchmark for judging captive investment return should be based on a published equity or bond index. A lower rate of return is less important to a captive than it is to a commercial insurer, unless the investment income is needed to support underwriting losses or discounted loss reserves. We are not proposing any specific index as a benchmark for captives, since investment managers themselves do not agree on any single standard. The benchmark of each captive depends on the investment policy statement objectives and constraints.

Investment income is generated by the investment portfolio of assets in the captive. There are two important aspects of managing the investment portfolio. First, if loss reserves are discounted for the time value of money, the average investment yield should be higher than the average discount rate used to determine the present value of claims. Second, the maturity schedule of the investment portfolio must be structured with consideration for the maturity schedule of claims. If claims are paid out faster than investments mature, certain investments may have to be liquidated prior to maturity, thereby lowering the total amount of investment income. Furthermore, liquidation may occur at a point when the financial markets are depressed, leading to a capital loss.

In addition to the underwriting risk assumed by the captive, management of the investment portfolio introduces other risks, such as timing and investment risks. Captives may choose to accept a higher level of investment risk in exchange for a higher return. However, as greater-than-normal underwriting risk is assumed, the combination of all risk factors may create significant stress on the financial integrity of the captive.

### OTHER COMPARATIVE STANDARDS

Other comparative standards used in evaluating insurance companies include RBC tests, IRIS tests by the NAIC (as described on page 14) and ratings published by A.M. Best. These standards deserve mention because captives can use them as a measure of how they differ from other insurance companies.

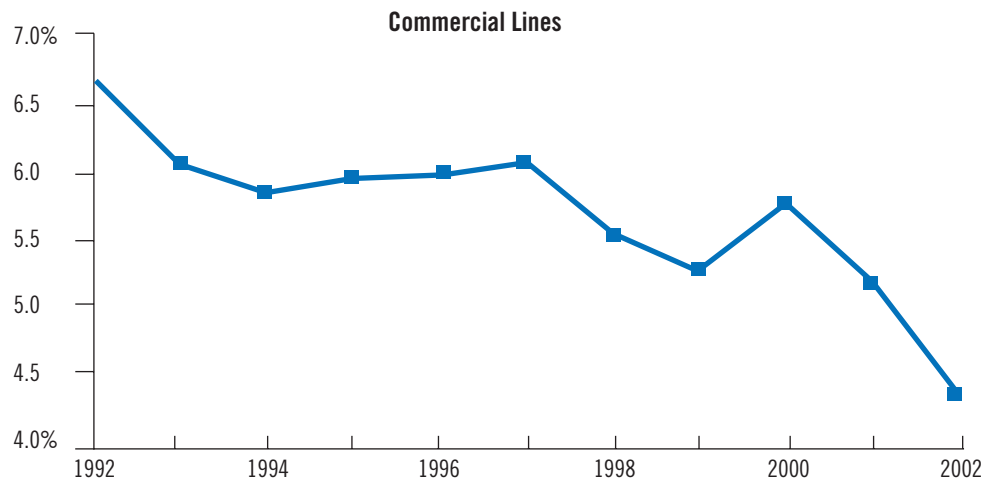
### RBC TESTS

RBC tests are used as a measure of capital adequacy and a signal of relative financial strength. The general approach determines the amount of capital required using factors applied to certain accounts in the financial statement and compares the actual capital to the calculated RBC.

The RBC approach focuses on three main categories of risk: underwriting risk, asset risk and credit risk. Within the underwriting risk, the analysis is usually split between pricing risk (amount of premium) and reserve risk (the amount of liabilities).

A capital factor is applied to each relevant financial account in these three main risk categories. The factor varies by line of insurance, type of asset and quality of the outstanding credit. Each factor is used to derive a capital amount required to support that specific risk category for that specific account. The sum of the derived capital amount for all risk categories and accounts is used as the RBC.

**EXHIBIT 11**  
**Ratio of Net Investment Income to Mean Assets Invested**



A.M. Best has developed ratings for approximately 200 captives.

In some cases, the method offsets the total amount of capital based on recognition of spread and diversification of risk.

A.M. Best, Standard & Poor's, Moody's and the NAIC all have RBC models.

### IRIS TESTS

From an insurance regulatory standpoint, the standards of financial performance are the IRIS tests. They include 12 ratios. Any company that fails four of the tests in a single year is identified as requiring "immediate regulatory attention" and assigned highest priority in the regulatory surveillance process. In an average year, 15% of the U.S. insurance companies followed by the NAIC fail four or more ratios. The IRIS tests are shown in *Exhibit 12*.

The information for these tests is gathered from the filed statutory annual statements. Captives, especially offshore, do not compile much of this type of data, and they probably never will. This is why the IRIS tests generally cannot be applied to captives.

### A.M. BEST RATINGS

A.M. Best is recognized as the leading agency in the U.S. for providing opinions concerning an insurance company's relative financial strength. Most quantitative analyses performed by A.M. Best are divided into four categories: profitability, liquidity, leverage and loss reserve. A.M. Best also provides a qualitative analysis of insurance company operations and management.

Insurance professionals often rely on the ratings published by A.M. Best for a quick view of the overall financial strength and performance of an insurance entity. A.M. Best ratings do not provide a faultless test of a company's security, only a relative test of a company's financial strength.

A.M. Best has developed ratings for approximately 200 captives.

### EXHIBIT 12 IRIS Ratios

IRIS Tests	Unusual Percentage Values	
	Over	Under
1. Gross premium to surplus	900	—
2. Net premium to surplus	300	—
3. Change in net writings (net written premium, current year/net written premium, prior year)	33	33
4. Surplus aid to surplus (commissions for unearned premium on ceded reinsurance/surplus)	15	—
5. Two-year overall operating ratio	100	—
6. Investment yield (net investment income/average invested assets)	10	4.5
7. Change in surplus	50	-10
8. Liabilities to liquid assets (total liabilities/liquid assets)	105	—
9. Agents' balances to surplus (usually meaningless in the captive context)	40	—
10. One-year reserve development to surplus (difference between current reserve estimates and prior-year reserves/surplus)	20	—
11. Two-year reserve development to surplus	20	—
12. Estimated current reserve deficiency to surplus	25	—

## ABOUT TOWERS PERRIN AND TILLINGHAST

Towers Perrin is a global professional services firm that helps organizations around the world optimize performance through effective people, risk and financial management. The firm provides innovative solutions to client issues in the areas of human resource strategy, design and management; actuarial and management consulting to the financial services industry; and reinsurance intermediary services.

Our businesses include HR Services, Reinsurance and Tillinghast.

The Tillinghast business of Towers Perrin provides global actuarial and management consulting to insurance and financial services companies and advises other organizations on risk financing and self-insurance. We help our clients with issues related to mergers, acquisitions and restructuring; financial and regulatory reporting; risk, capital and value management; products, markets and distribution; and financial modeling software solutions. More information about Tillinghast is available at [www.towersperrin.com/tillinghast](http://www.towersperrin.com/tillinghast).

