An Empirical Map of Enterprise Risk Space for Life Insurers: Implications for ERM

Etti G. Baranoff
Thomas W. Sager

Abstract

In this paper we use accounting data of the life insurance industry in 2003 to examine the empirical relationship between the spectrum of enterprise risks and the spectrum of enterprise risk management (ERM) tools of this industry. We find asset and product risk management tools appropriately interrelated with asset and product risks, but little matching interrelationship between operational risks and tools despite significant deployment of variables to proxy such risks and tools. Following earlier work (Baranoff and Sager, 2006), we design maps of risk and ERM tool space by extracting over 150 risk variables and over 70 ERM variables from insurer annual statements. We group the risk variables into clusters of thematically related risks through cluster analysis to determine the groups and through factor analysis to identify the themes. We similarly group the ERM tools. We interpret the risk clusters as a map of risk space and the ERM tool clusters as a map of tool space. We then ascertain the relationship between risks and risk-mitigating tools by canonical correlation of the most important factors of each space. Theoretical conventional wisdom expects that risk space should be organized into asset, product and operational risk categories with significant cross-category overlap generated by financial risk and the risk of asset/liability matching (ALM). The organization of tool space is expected to mirror the hypothetical organization of risk space, since insurers deploy the tools to mitigate the risks. Our results show that in the ERM tools, the health and life ALM tools are present and mitigate both asset and product risks. Noticeable by its absence is a role for operational risks (except in one factor) or tools. We provide visual mapping of Risks-ERM interrelationships of insurers. Insurers can place themselves in any of these relational maps or aspire to use them as benchmark tools.

Introduction

Corporations face a broad spectrum of risks, which they try to manage holistically. Enterprise risk management (ERM) does not supplant, but rather supplements, the traditional management of separate risk exposures (Baranoff, 2004a, b and c). As noted in Baranoff and Sager (2006), all aspects of risk—pure and speculative—are recognized within the objective to maximize the firm's value and as such are of interest in an ERM study. The current article is an extension of the Baranoff and Sager (2006) study of life insurers' risk and ERM tool spaces. Whereas the earlier work focused on discerning the structure of risk and tool space, the focus in this article is on the interactions between the risks and ERM tools. To achieve this objective, some of the steps of Baranoff and Sager (2006) are repeated, but with an enhanced set of proxies for risks and ERM tools.

Conventional thinking, depicted in Figure 1, reflects the view that the spectrum of ERM tools is directed against the spectrum of enterprise risks confronting insurers. The conventional wisdom also expects that risk space should be organized into asset, product and operational risk categories with significant cross-category overlap generated by financial risk and the risk of asset/liability matching (ALM). The organization of tool space is expected to mirror the hypothetical organization of risk space. We are initially neutral regarding this hypothesis. Our objective is to determine the empirical reality based on insurer behavior as reflected in their financial statements.

We use accounting data of U.S. life insurers to map the spectrum of ERM tools and the spectrum of enterprise risks and their interrelationship. These are empirical maps. They show what insurers actually do with the actual risks they confront, as reflected in their annual statement data. The maps are also hierarchical. Just as geographic maps show how counties relate to each other inside states and then inside nations, so the enterprise risk maps figuratively show how risks relate to each other in themes and the themes to each other in higher-order themes—and similarly for ERM tools. Just as geographic maps highlight important cities and roads, so the enterprise risk maps identify key factors within the themes. The ultimate objective is to understand how the ERM tools match up with the risks they were designed to manage. A

map helps us understand the region displayed. By comparing two maps, we can understand how they interrelate. Our maps are statistical in nature, rather than geographical, based on cluster analytic groupings, with factor analysis used to reveal their meaning. The process we adopt here, utilizing Figure 1 for illustration, is as follows:

(1)   Uncover the best way to analyze the risk space of life insurers in order to have a clearer view of the risks. These risks are assumed to be overlapping and dependent to some extent. (The visual illustration of the risks in Figure 1 (Part A) is for demonstration only. Keep in mind the fuzziness of relationships.)

(2)   Follow the process of step (1) for the ERM tools and activities of the life insurer (see Figure 1, Part B). For example, one important tool is the ALM (see Santomero and Babbel, 1997) and

(3)   Analyze the relationships between the risks space and the ERM tool space (interrelationship between Parts A and B in Figure 1). Unlike studies such as Santomero and Babbel (1997) that used surveys and interviews, our empirical analyses attempt to unveil the actual ERM activities of life insurers in response to the risks and vice versa using life insurers' own accounting reports. Our statistical techniques offer the opportunity to convert these data elements into actual stories about risk exposures and ERM behavior.

Using cluster analysis in combination with factor analysis and over 150 variables from the 2003 life insurance annual statement of about 1,000 U.S. life insurers, this paper attempts to respond to the main question:

What is the correlation between risk and ERM tools?

This can be answered only after we unveil

- The risks of life insurance companies
- The ERM tools used by insurers and
- Their themes.

Explanation and Illustration

To illustrate better the objective of our study we created Figure 1 noted above, reproduced from Baranoff and Sager (2006). Figure 1 depicts our interpretation of the conventional wisdom about the structure of the risks and ERM tools of financial institutions, and particularly, life insurers: (Part A) the space of risks, (Part B) the space of ERM, and (Part C) the interaction between the risks space in Part A and the ERM tools space in Part B.

Part A depicts the risk space of life insurers in its form as most commonly apprehended in current research (i.e., Baranoff and Sager, 2002 and 2003; Cummins and Sommer, 1996; and Shrieves and Dahl, 1992) and in practice. The enterprise risks of a life insurer originate from three broad activities in which life insurers engage: underwriting (product) risks that arise from selling insurance contracts and policies; asset risks that arise from investing premiums and other income; and operational risks from engaging in necessary and appropriate supporting activities as a business entity. ALM is considered a major risk overlapping all three categories and is denoted as a major ERM tool.

It is important to note that the conventional wisdom does not regard these risks as mutually exclusive. Many risks overlap each other and have fuzzy boundaries. The full story of risks is too complex to portray in detail, given the limitations of schematics such as Figure 1.

Part B is the space of the ERM tools in mitigating the risks described in Part A. This part utilizes tools discussed by the survey study of Santomero and Babbel (1997), RM tools discussed in Baranoff (2004a) and many practical tools that can be proxied using accounting data. Again, as in Part A, ERM tools are categorized in three groups: for asset risk, for product risk and for operational risks that flow from Part A. The same complexity that is emphasized for Part A is applicable to Part B.

Figure 1
The Conventional View of Risk and ERM Tools

Part C: Interaction between Risk and ERM Tools Spaces	RISKS		ERM TOOLS
	Capital structure risk <====>		Capital structure risk management
	ALM risk <====>		ALM risk management
	Asset risk <====>		Asset risk management
	Product risk <====>		Product risk management
	Operational risk <====>		Operational risk management
	Capital Structure (Financial risk) Management Tools		
	ALM Management Tools		
Part B: Life Insurers' ERM Tools	ASSET RISK Management Tools	PRODUCT RISK Management Tools	OPERATIONAL RISK Management Tools
	• Hedging/derivatives • Asset allocation management (Active versus passive)	• Reinsurance • Reserving • Securitization • Diversification	• Control over agents and brokers • Organizational/corporate structure • Adherence to regulation • IT controls • Operational safety and loss controls
Part A: Life Insurers' Enterprise Risks	SPECTRUM OF RISKS OF LIFE INSURERS		
	Capital Structure (Financial risk)		
	ALM		
	ASSET RISK	PRODUCT RISK	OPERATIONAL RISK
	• Default risk • Volatility risk (market risk) • Liquidity risk	• Catastrophes risk • Incomplete contracts risk • Reserves risks	• IT risk • Distribution risk • Regulatory risk • Legal risk • Globalization risk

Part C illustrates the interaction between parts A and B.

Data, Methodologies and Results

Since we are working with more than 150 variables, our discussion of the data is necessarily truncated. See the Appendix for summary statistics. We undertake the work in four steps as follows:

Following Baranoff and Sager (2006), we first map the enterprise risk space of life insurers. Using accounting data of life insurers for 2003, the risk space is developed using a two-step methodology: (1) cluster analysis to group risk variables into related clusters; and (2) factor analysis to uncover the hidden dimensions of those clusters. We identified over 150 proxies for risk variables in annual report data filed with the NAIC. The results shown here use year 2003 reports for nearly 1,000 life insurers, and then delete firms lacking information or having anomalous data values, such as negative assets.

Cluster Analysis Methodology

The clustering algorithm that we used is hierarchical agglomerative in nature. Note that we cluster *variables* rather than *insurers*. Clustering begins with each risk variable in its own singleton cluster. It then joins the two risk variables that are most highly correlated. The algorithm proceeds in this manner, at each step merging the two clusters that are most highly correlated with each other. Thus, the number of remaining clusters is reduced by one at each step. Eventually the process ends with one super-cluster containing all the variables. By studying the history of the cluster mergers, one can identify a step in which all remaining clusters are relatively disparate. That step identifies an optimal set of clusters of risk variables. There is a degree of subjectivity in the selection of an "optimal" stopping point in the mergers, since cluster analysis is more an exploratory technique than a tool with a well-developed theory of optimality. Nonetheless, it can be quite helpful and illuminating. In addition, the analyst has the option of selecting an early stop in order to preserve more structure—or a late stop in order to reveal higher-order "super-clusters" of related clusters. An example of super-clustering would be the proposed classification of insurer risks into *asset*, *product-liability* and *operational* categories on theoretical grounds. Each of these large groups could have numerous sub-clusters within it.

Results of Cluster Analysis for Risks

Figure 2 reproduces a dendrogram from the cluster analysis. The dendrogram shows the historical record of cluster mergers from the initial classification of each risk variable into its own separate cluster (at the left of the dendrogram) to the final super-cluster of all risk variables (at the right of the dendrogram). From study of the dendrogram, we selected an eight-cluster solution.

Figure 2 and Table 1 show the cluster assignments of each of the risk variables. The cluster number is an arbitrary label that serves only to identify cluster members and lacks significance in itself. The clusters may contain many different types of categories.

Figure 2
Eight Main Clusters for the Risk Space
Clusters of Risk Variables
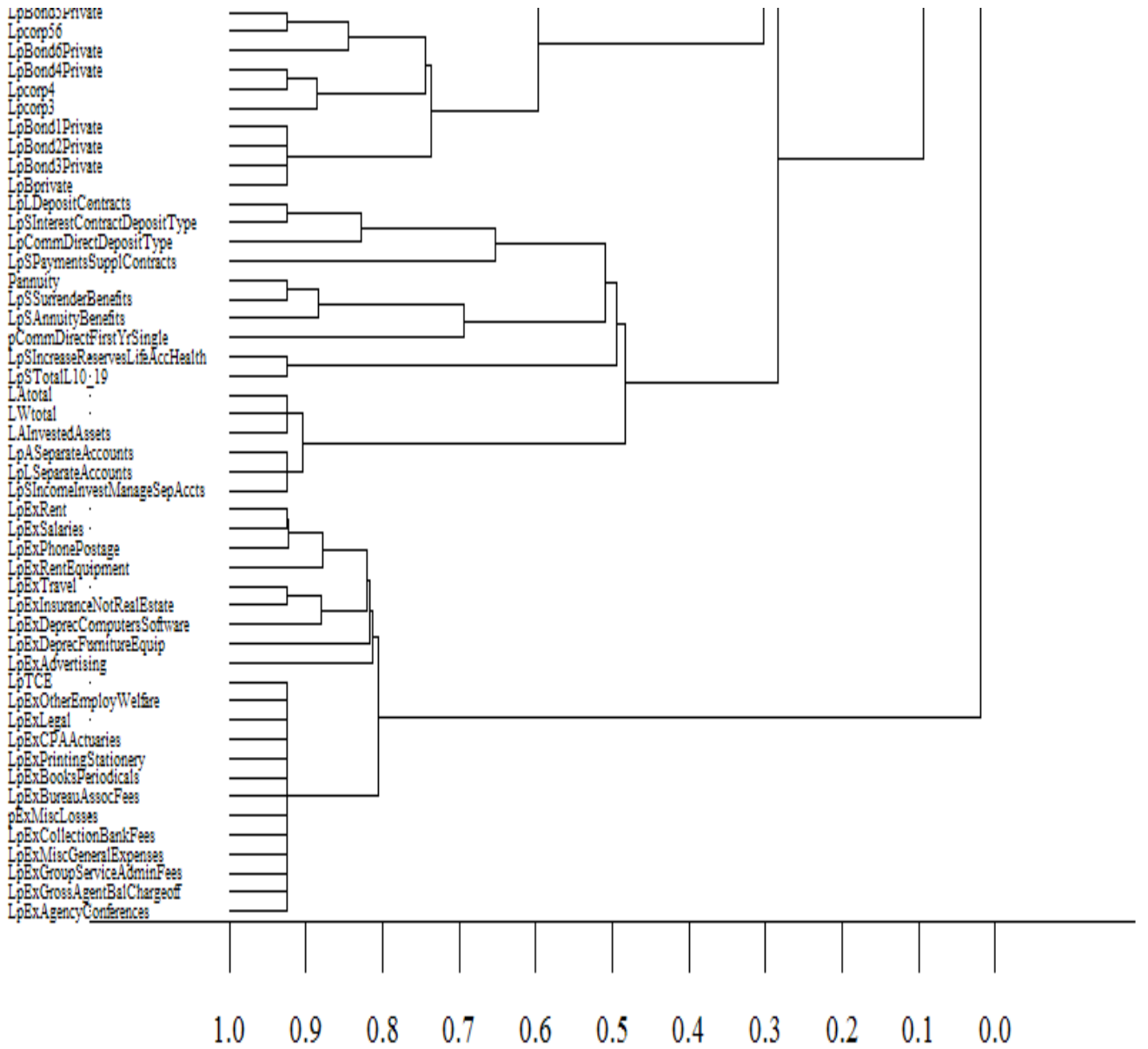
Proportion of Variance Explained

TABLE 1
Clusters of the Risk Variables
(Summary Statistics of all Variables are Available in the Appendix)

RISK VAR	CLUSTER	RISK VAR	CLUSTER
AnnORDlogNChange	1	LCAP	2
LAInvestedAssets	1	LpAComputersSoftware	2
LAtotal	1	LpANetDeferredTaxAsset	2
LBestLikert	1	LpAOtherReceivReins	2
LpAPolicyLoans	1	LpAReceivParentSubsid	2
LpARealEstateOccupiedEncumber	1	LpARecoverableReins	2
LpASeparateAccounts	1	LpATaxFederalForeign	2
LpBond1Private	1	LpClaimsDirectEndThisYr	2
LpBond2Private	1	LpClaimsTOTALBenefitsDuringYr	2
LpBond3Private	1	LpClaimsTOTALSettleDuringYr	2
LpBond4Private	1	Lpgov1	2
LpBond5Private	1	Lpgov2	2
LpBond6Private	1	LpLAgentCommissionsDue	2
LpBprivate	1	LpLCapitalSurplus	2
LpCommDirectDepositType	1	LpLCommonStock	2
Lpcorp12	1	LpLContractClaimsHealth	2
Lpcorp3	1	LpLGeneralExpensesDue	2
Lpcorp4	1	LpLHeldForAgents	2
Lpcorp56	1	LpLInterestMaintReserve	2
LpExAgencyExpenseAllow	1	LpLPaidSurplus	2
LpExAgentBenefitPlans	1	LpLPayableParentSubsidAffil	2
LpExAgentNonfundedBenefitPlans	1	LpLReserveHealth	2
LpExOtherInvestExpense	1	LpLSurplus	2
LpExRealEstateExpense	1	LpLTaxFederalForeign	2
LpLDepositContracts	1	LpLTaxFederalForeignCurrent	2
LpLifeTOTALAmtSurrender	1	LpLTaxFeesNotFederal	2
LpLSeparateAccounts	1	LpLTransferSeparateAccounts	2
LpLSurplusNotes	1	LpRcapital	2
LpSAmortInterestMaintReserve	1	LpSCommissOnPremDepositType	2
LpSAnnuityBenefits	1	LpSDisabilityAccHealthBenefits	2
LpSChangeSurplusPaidIn	1	pCommDirectRenewal	2
LpSChangeSurplusTransToCapital	1	Phealth	2
LpSDeathBenefits	1	LpADeferPremAgentBal	3
LpSIncomeInvestManageSepAccts	1	LpExReimburseByUninsurAccHealth	3
LpSIncreaseReservesLifeAccHealth	1	LpLOtherEmployeeAgentBenefits	3
LpSInterestContractDepositType	1	LpLPreferredStock	3
LpSMaturedEndowments	1	LpLRetainedAsAgent	3
LpSNetChangeCapitalSurplus	1	LpLTreasuryStockPreferred	3
LpSPaymentsSupplContracts	1	LpSChangeCapitalTransFromSurplus	3
LpSReserveAdjustReinsCeded	1	Plife	3
LpSSurrenderBenefits	1	LpACash	4
LpSTotalL10_19	1	LpClaimsReinsAssEndThisYr	4
Lputil	1	LpCommExpReinsurAssumed	4
LWtotal	1	LpCommExpReinsurCeded	4
Pannuity	1	Lpgov3	4
pCommDirectFirstYrNotSingle	1	Lpgov5	4
pCommDirectFirstYrSingle	1	LpLContractClaimsLife	4
pLReserveLife	1	LpLFundsHeldUnauthReinsur	4
XpClaimsTOTALRecovReinsDuringYr	1	LpLOtherPayableReinsurance	4
		LpLReinsurAssumedCommExpAllow	4
		LpSCommissExpOnReinsurAssumed	4
		LpSCommissionsExpReinsCeded	4
		Preinsur	4

RISK VAR	CLUSTER
HealthTOTALlogPolNChange	5
LifeTOTALlogPolNChange	5
LpAOtherNonadmitAssets	5
LpAWriteInNotInvAssets	5
LpExEmployBenefitPlans	5
LpExInvestigateSettleClaims	5
LpExOtherAgentWelfare	5
Lpgov4	5
LpLTreasuryStockCommon	5
LpLWriteInExSurplusFunds	5
LpSChangeCapitalPaidIn	5
LpSChangeSurplusForReinsur	5
LpSChangeSurplusTransFromCapital	5
LpSCouponsGuarPureEndowments	5
LpSGroupConversions	5
pSChangeSurplusNotes	5
pSOtherChangeSurplusSepAccts	5
XpClaimsTOTALLiabPaidDuringYr	5
LpAAdjustForeignExch	6
LpAShortTerm	6
LpCommExpReinsurDiffCed_Ass	6
LpExEmpNonfundedBenefitPlans	6
LpLAdjAssetLiabForeignExchRate	6
LpLExperienceRatingRefunds	6
LpLifeTOTALNSurrender	6
LpLSurrenderCanceledContracts	6
LpLWriteInSurplusFunds	6
LpmuniHI	6
LpmuniLO	6
LpSSurplusWithdrawSepAccts	6
LRatingDate	6
LRBCratio	6
LRetOnCap	6
Performance	6
pSChangeAccountingPrinciples	6
pSChangeCapitalTransToSurplus	6
RBCind	6

RISK VAR	CLUSTER
LpExAdvertising	7
LpExAgencyConferences	7
LpExBooksPeriodicals	7
LpExBureauAssocFees	7
LpExCollectionBankFees	7
LpExCPAActuaries	7
LpExDeprecComputersSoftware	7
LpExDeprecFurnitureEquip	7
LpExGrossAgentBalChargeoff	7
LpExGroupServiceAdminFees	7
LpExInsuranceNotRealEstate	7
LpExLegal	7
LpExMiscGeneralExpenses	7
LpExOtherEmployWelfare	7
LpExPhonePostage	7
LpExPrintingStationery	7
LpExRent	7
LpExRentEquipment	7
LpExSalaries	7
LpExTravel	7
LpTCE	7
pExMiscLosses	7
LpACommonStock	8
LpLAssetValuationReserve	8
LpLNetDeferredTax	8
LpOppARisk	8
LpRegARisk	8
pLUnassignedSurplusFunds	8

We propose the eight clusters as a good cut at a map of the geography of insurer risk space. We experimented with more and fewer clusters, but we could not obtain a much better characterization of the clusters of risks. To understand the meaning of the map, we need to understand why the variables were clustered as they were. We need to understand the themes that make one cluster of risk variables more related to each other than to another cluster.

Results of Cluster Analysis for ERM Tools

Following the same process of clustering the risk variables, we also create the clusters for the ERM tools variables. Figure 3 and Table 2 show the eight clusters selected for the ERM space.

Figure 3
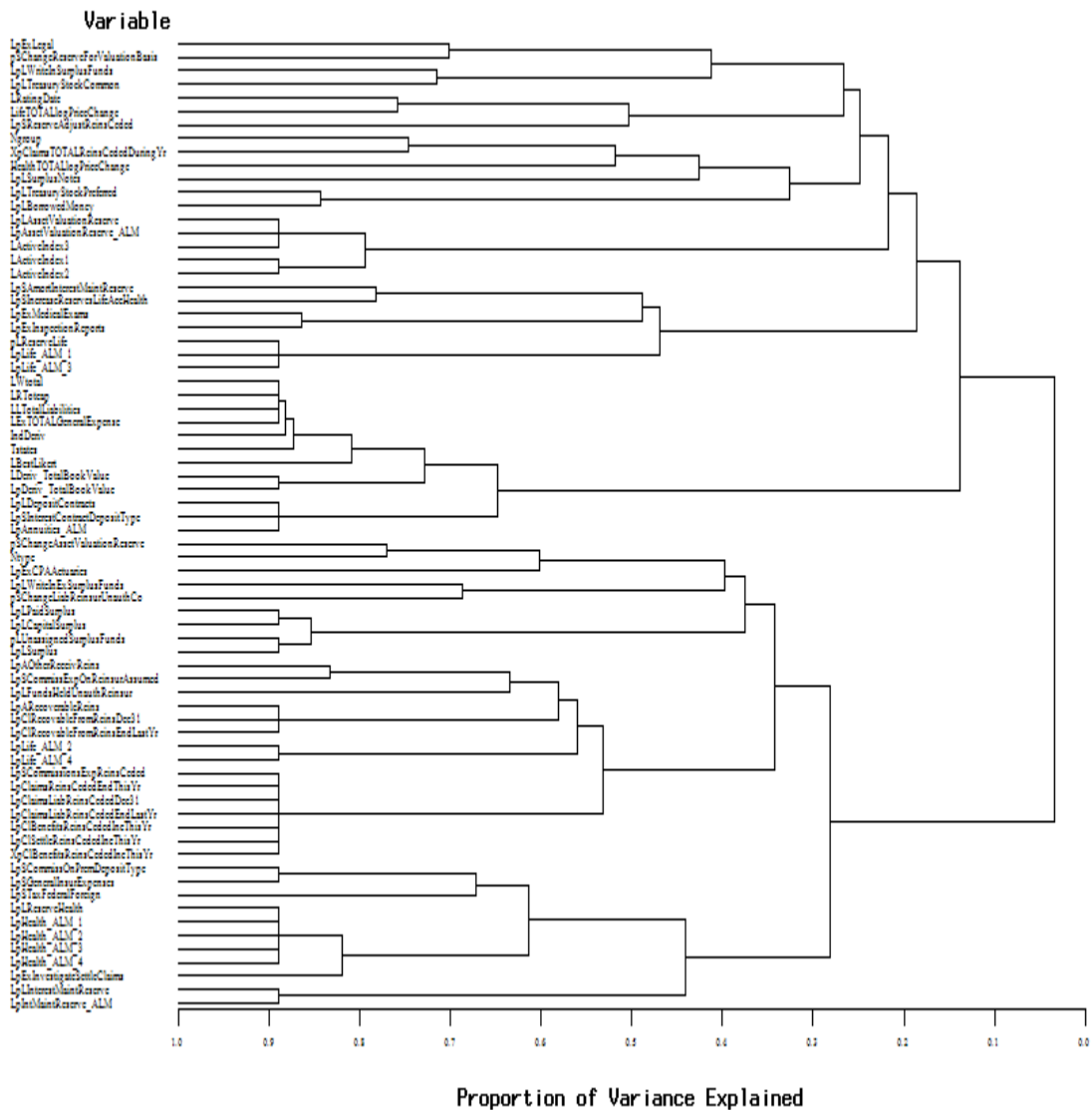**Eight Main Clusters for the ERM Tools Space**

Clustering of ERM Variables

TABLE 2
Clusters of the ERM Tools Variables
(summary statistics are available in the Appendix)

ERM TOOL VAR	CLUSTER
IndDeriv	1
LBestLikert	1
LDeriv_TotalBookValue	1
LExTOTALGeneralExpense	1
LLTotalLiabilities	1
LpAnnuities_ALM	1
LpDeriv_TotalBookValue	1
LpLDepositContracts	1
LpSInterestContractDepositType	1
LRTotcap	1
LWtotal	1
Tstates	1
LifeTOTALlogPriceChange	2
LpSReserveAdjustReinsCeded	2
LRatingDate	2
LpAOtherReceivReins	3
LpARecoverableReins	3
LpClaimsLiabReinsCededDec31	3
LpClaimsLiabReinsCededEndLastYr	3
LpClaimsReinsCededEndThisYr	3
LpClBenefitsReinsCededIncThisYr	3
LpClRecovableFromReinsDec31	3
LpClRecovableFromReinsEndLastYr	3
LpClSettleReinsCededIncThisYr	3
LpExCPAActuaries	3
LpLCapitalSurplus	3
LpLFundsHeldUnauthReinsur	3
LpLife_ALM_2	3
LpLife_ALM_4	3
LpLPaidSurplus	3
LpLSurplus	3
LpLWriteInExSurplusFunds	3
LpSCommissExpOnReinsurAssumed	3
LpSCommissionsExpReinsCeded	3
Ntype	3
pLUnassignedSurplusFunds	3
pSChangeAssetValuationReserve	3
pSChangeLiabReinsurUnauthCo	3
XpClBenefitsReinsCededIncThisYr	3

ERM TOOL VAR	CLUSTER
LpExInspectionReports	4
LpExMedicalExams	4
LpLife_ALM_1	4
LpLife_ALM_3	4
LpSAmortInterestMaintReserve	4
LpSIncreaseReservesLifeAccHealth	4
pLReserveLife	4
LpExInvestigateSettleClaims	5
LpHealth_ALM_1	5
LpHealth_ALM_2	5
LpHealth_ALM_3	5
LpHealth_ALM_4	5
LpIntMaintReserve_ALM	5
LpLInterestMaintReserve	5
LpLReserveHealth	5
LpSCommissOnPremDepositType	5
LpSGeneralInsurExpenses	5
LpSTaxFederalForeign	5
LActiveIndex1[1]	6
LActiveIndex2[2]	6
LActiveIndex3[3]	6
LpAssetValuationReserve_ALM	6
LpLAssetValuationReserve	6
HealthTOTALlogPriceChange	7
LpLBorrowedMoney	7
LpLSurplusNotes	7
LpLTreasuryStockPreferred	7
Ngroup	7
XpClaimsTOTALReinsCededDuringYr	7
LpExLegal	8
LpLTreasuryStockCommon	8
LpLWriteInSurplusFunds	8
pSChangeReserveForValuationBasis	8

---

[1] The ActiveIndex and Performance formulas. The lag values are available from the previous year's data, which are in the dataset from which these vars are extracted.
ActiveIndex1 = (ABS(rBUY_Bonds - lagrBUY_Bonds) + ABS(rBUY_Stocks - lagrBUY_Stocks)
+ABS(rBUY_Mortgages - lagrBUY_Mortgages) + ABS(rBUY_RealEstate - lagrBUY_RealEstate)
+ABS(rBUY_OtherInvestedAssets - lagrBUY_OtherInvestedAssets))/**5**;

[2] ActiveIndex2 = (ABS(rBUY_Bonds - pCF_Bonds) + ABS(rBUY_Stocks - pCF_Stocks)
+ABS(rBUY_Mortgages - pCF_Mortgages) + ABS(rBUY_RealEstate - pCF_RealEstate)
+ABS(rBUY_OtherInvestedAssets - pCF_OtherInvestedAssets))/**5**;

[3] ActiveIndex3 = (ABS(rBUY_Bonds - pBonds) + ABS(rBUY_Stocks - pStocks)
+ABS(rBUY_Mortgages - pMortgages) + ABS(rBUY_RealEstate - pRealEstate)
+ABS(rBUY_OtherInvestedAssets - pOtherInvestedAssets))/**5**;

Factor Analysis uncovers the hidden themes of the clusters. As you will see below, the factor analysis uncovered the first two or three factors in five of the eight risks clusters only and also in five of the eight ERM tools clusters.

Factor analysis attempts to determine the underlying (latent, unobserved or common) factors that account for observed variables X_1, X_2, ..., X_p when it is not possible to directly measure the true underlying causes of X_1, X_2, ..., X_p . Factor analysis attempts to determine the number of such factors, to estimate them, and to interpret their meaning. The following is a brief sketch of the factor analysis model and assumptions:

(a)　There are m **common factors** ξ_1, ..., ξ_m that underlie p ($p > m$) variables X_1, X_2, ..., X_p.

(b)　Each variable X_i is a linear combination of one or more common factors and a **unique factor** ε_i (unique to X_i):

$$X_1 = \lambda_{11}\xi_1 + \lambda_{12}\xi_2 + \cdots + \lambda_{1m}\xi_m + \varepsilon_1$$
$$X_2 = \lambda_{21}\xi_1 + \lambda_{22}\xi_2 + \cdots + \lambda_{2m}\xi_m + \varepsilon_2$$
$$\vdots$$
$$X_p = \lambda_{p1}\xi_1 + \lambda_{p2}\xi_2 + \cdots + \lambda_{pm}\xi_m + \varepsilon_p$$

Each ξ_j contributes to at least two variables (at least two of λ_{1j}, λ_{2j}, λ_{3j}, ..., λ_{pj} are nonzero), for if only one $\lambda_{ij} \neq 0$, for some $i = 1, 2, ..., p$, then ξ_j would really be part of the unique factor for that X_i.

(c)　All ξs and X's are standardized to mean 0, stdev 1.[4]

(d)　corr(ε_i, ε_j) = 0 for all i,j, $i \neq j$ [5]

(e)　corr(ξ_i, ε_j) = 0 for all i,j [6]

(f)　*[Initially]* corr(ξ_i, ξ_j) = 0 for all i,j, $i \neq j$. I.e., the initial extracted factors are uncorrelated (orthogonal).

---

[4]　We will not suppose that the unique term ε is standardized, although we will assume that ε has mean zero. Thus Var(ε) need not be 1.

[5]　This is a natural assumption: If two ε's could be correlated, then part of their effects would be in common to their two X-variables and not unique to their separate X-variables.

[6]　This is a natural assumption: If a common factor correlates with another unique factor, then that other unique factor is not unique to its X-variable, but also shares in the explanation of the X-variable of the common factor. And if a common factor correlates with its own unique factor, then that unique factor necessarily correlates with another X-variable (because the common part is, after all, in common to the X-variables), and so is also not unique.

Results of Factor Analysis within the Risk Clusters and ERM Clusters—Creation of the Risk and ERM Tools Maps

We look to the first few factors to determine the meaning of the cluster. The first few factors are usually responsible for a substantial proportion of the variability of the cluster variables (denoted by the eigenvalue), and the meaning of a factor can be gleaned from the variables with highest factor loadings. For those clusters with high eigenvalues (high variance explained by each factor), Table 3 shows the loadings for the most significant factors in each of the of these risk clusters. We also provide our interpretation of the resultant themes of the clusters.

TABLE 3
Risk Space—Factor Loadings for the Clusters with High Variance Explained by the Factors (Eigenvalues) and their Themes

Theme		
Cluster 1		
Factor Number	Eigenvalue	
1	9.696722	
2	3.746450	
3	2.679885	
Variable	Factor1	**Liquidity—Asset risk**
LAtotal	0.876416	
LAInvestedAssets	0.841905	
LpBond2Private	0.818397	
LpBprivate	0.818267	
LWtotal	0.753522	
LpBond1Private	0.737044	
LpBond3Private	0.715046	
Variable	Factor2	**Life product risks**
LpAPolicyLoans	0.523196	
pLReserveLife	0.497873	
LpSDeathBenefits	0.456245	
Variable	Factor3	
LpSIncreaseReservesLifeAccHealth	0.640158	**Reserves risk—Product risk**
LpSTotalL10_19	0.595813	
pLReserveLife	0.522153	

	Theme
Cluster 2	
Factor Number	Eigenvalue
1	8.83019
2	3.62399
Variable	Factor1	**Claims settlements—Product risk**
LpClaimsDirectEndThisYr	0.895912
LpClaimsTOTALSettleDuringYr	0.872350
LpClaimsTOTALBenefitsDuringYr	0.825972
LpLContractClaimsHealth	0.799585
Phealth	0.757487
LpLCapitalSurplus	0.739532

Variable	Factor2	**Product (health)/Operational (Commission)**
LpSCommissOnPremDepositType	0.599825
LpSDisabilityAccHealthBenefits	0.552968

Cluster 4

Factor Number	Eigenvalue
1	3.259321
2	1.479996

Variable	Factor1	
Preinsur	0.854684	**Reinsurance assumed (commission and claims)**
LpCommExpReinsurAssumed	0.813689
LpSCommissExpOnReinsurAssumed	0.802858
LpClaimsReinsAssEndThisYr	0.702083

Variable	Factor2	**Commission on reinsurance ceded**
LpSCommissionsExpReinsCeded	0.745985
LpCommExpReinsurCeded	0.515113

Cluster 7

Factor Number	Eigenvalue
1	6.330915
2	2.166834

Variable	Factor1	**Operational expenses**
LpExPrintingStationery	0.773015
LpExOtherEmployWelfare	0.736351
LpExRentEquipment	0.668938

Variable	Factor2	
LpExCPAActuaries	0.293973	**Operational expenses**

Cluster 8

Factor Number	Eigenvalue
1	3.149836

Variable	Factor1	**Asset risk**
LpRegARisk	0.945318
LpACommonStock	0.925597
LpOppARisk	0.856042

Table 3 shows that the themes of the risk map correspond to various aspects of the risks depicted in Figure 1—asset, product and operational risks.

Table 4 replicates the process for the ERM tools map. Again, we focus on the clusters where the factors have high eigenvalues. Table 4 provides the ERM tools map that emerged for the life insurers in 2003. We see that ALM for each line of life insurance is part of the map as well as capital management and reinsurance. We included special proxies for active/passive asset allocation strategies, and they also emerge as a theme of cluster 6. Reinsurance as a tool and inspection also emerge as part of the ERM tools map.

Table 4
ERM Tools Space—Factor Loadings for the Clusters with High Variance
Explained by the Factors (Eigenvalues) and their Themes

		Themes
Cluster 1		
Factor Number	Eigenvalue	
1	4.777433	
2	1.919287	
Variable	Factor1	**Size and derivatives**
LLTotalLiabilities	0.886553	
LWtotal	0.782013	
LRTotcap	0.708080	
IndDeriv	0.706148	
Variable	Factor2	**Annuities ALM**
LpLDepositContracts	0.760578	
LpAnnuities_ALM	0.748365	
Cluster 3		
Factor Number	Eigenvalue	
	6.097146	
	2.694351	
Variable	Factor1	**Reinsurance ceded**
LpClaimsLiabReinsCededDec31	0.900162	
LpClaimsReinsCededEndThisYr	0.900162	
LpClaimsLiabReinsCededEndLastYr	0.862172	
LpClSettleReinsCededIncThisYr	0.840958	
XpClBenefitsReinsCededIncThisYr	0.826632	
Variable	Factor2	**Capital management**
LpLSurplus	0.853020	
LpLCapitalSurplus	0.826342	
LpLPaidSurplus	0.822995	

	Themes	
Cluster 4		
Factor Number	Eigenvalue	
1	2.591291	
2	1.502502	
Variable	Factor1	**Life ALM**
LpLife_ALM_1	0.936286	
LpLife_ALM_3	0.894617	
pLReserveLife	0.878939	
Variable	Factor2	
LpExInspectionReports	0.860757	**Inspections and exams (Operational)**
LpExMedicalExams	0.829734	

	Themes	
Cluster 5		
Factor Number	Eigenvalue	
1	4.156133	
2	1.887307	
Variable	Factor1	**Health ALM**
LpHealth_ALM_1	0.897746	
LpHealth_ALM_3	0.866827	
LpHealth_ALM_4	0.844573	
LpLReserveHealth	0.844375	
LpHealth_ALM_2	0.830254	
Variable	Factor2	**Maintenance reserve**
LpLInterestMaintReserve	0.915656	
LpIntMaintReserve_ALM	0.883388	

	Themes	
Cluster 6		
Factor Number	Eigenvalue	
	1 2.879384	
		Asset allocation strategies and asset valuation reserves
Variable	Factor1	
LpAssetValuationReserve_ALM	0.812446	
LActiveIndex3	0.794990	
LpLAssetValuationReserve	0.764336	
LActiveIndex1	0.742731	
LActiveIndex2	0.671897	

The Relationship between Risk and ERM Tools Maps

As noted above, the objective of this paper is to examine the interrelationship between the map of risk space and the map of ERM tool space. In order to do this, we used the factors of each of the risk and ERM tools clusters shown in Tables 3 and 4 and also included the first one or two factors of the mixed clusters that did not emerge as having a clear theme during the factor analysis step. We used 18 factors selected from risk space and 14 from ERM tool space. With these two sets of factors to represent their respective spaces, we then interrelated them using the canonical correlation methodology.

Canonical correlation is a generalization of multiple regression in which multiple response variables are permitted, in addition to multiple predictors. Moreover, the direction of the relationship need not be specified. In the case at hand, we view that as an advantage. One can argue plausibly that the ERM tools employed by an insurer are a function of the risks assumed. But one could argue just as plausibly, in our view, that the risks assumed are a function of and limited by the tools available to mitigate them. Some would therefore argue for a simultaneous equations approach, with both risks and tools expressed as functions of each other and of other predictors. However, there are so many risks and tools that the proliferation of equations might overwhelm human ability both to specify and to make sense of them. Moreover, the simultaneous equations approach would define both risks and ERM tools implicitly as functions of a common set of instruments in reduced form. We are not yet persuaded of the truth of such an assumption. Following is a brief description of the canonical correlation methodology.

Canonical Correlation Analysis Methodology

In canonical correlation, we are interested in the interrelationship between one group of variables Y_1, Y_2, ..., Y_q and another group X_1, X_2, ..., X_p . Note that multiple regression is a special case of canonical correlation in which the Y-group contains only one variable. Formally, in canonical correlation models, after standardizing both the X's and the Y's, the model finds a pair of linear combinations.

$$W_1 = \alpha_{11}*X_1 + \alpha_{12}*X_2 + ... + \alpha_{1p}*X_p$$

$$V_1 = \beta_{11}*Y_1 + \beta_{12}*Y_2 + ... + \beta_{1p}*Y_q$$

that have maximum correlation with each other. Thus W_1 best represents the X's in explaining the Y's, and V_1 best represents the Y's in explaining the X's. And together, (W_1, V_1) best explain the relationship between the Y's and the X's.

Once the first pair (W_1, V_1) have been chosen, the search begins for a second pair:

$$W_2 = \alpha_{21}*X_1 + \alpha_{22}*X_2 + ... + \alpha_{2p}*X_p$$

$$V_2 = \beta_{21}*Y_1 + \beta_{22}*Y_2 + ... + \beta_{2p}*Y_q$$

chosen to have maximum correlation with each other, subject to W_2 being uncorrelated with W_1 and V_1, and V_2 being uncorrelated with W_1 and V_1. The idea is that (W_2, V_2) should do the best possible job of explaining what *remains* to be explained of the relationship between the Y's and the X's, after the first pair have had their say. The process of finding pairs of linear combinations continues until $m = \min(p,q)$ pairs have been found. Interpretation of the linear combinations is informed by principles similar to those involved in interpreting factors in factor analysis.

Canonical Correlation Results

To apply canonical correlation, we selected the $q = 14$ important factors from ERM tool space to use as $Y_1, Y_2, ..., Y_{14}$ and the $p = 18$ important factors from Risk space to use as $X_1, X_2, ..., X_{18}$. Table 5 shows the first five canonical variate pairs (ERM1-ERM5 and RISK1-RISK5). ERM1 is paired with RISK1, ERM2 with RISK2, etc. These five canonical pairs explain 41 percent, 26 percent, 16 percent, 5 percent and 5 percent of the total interrelationship between the selected risk factors and ERM tool factors, respectively, and have canonical R-squares of 0.88, 0.82, 0.75, 0.50 and 0.47.[7] The table displays the correlations of each canonical variate with the ERM or RISK factors that it represents. These loadings are used as in factor

---

[7] For example, $0.88 = \text{corr}(RISK1, ERM1)^2$, etc.

analysis to obtain the meanings of the canonical variates. Shading indicates the most important loadings for interpretation, in our view.

TABLE 5A
Correlations Between the ERM Tool Factors and their Canonical Variates

Factor	Theme	ERM1	ERM2	ERM3	ERM4	ERM5
ERMclus1F1	**Sophistication (size and derivatives)**	0.6879	-0.1155	0.6450	-0.0631	0.1461
ERMclus1F2	**Annuities ALM**	-0.0024	-0.2872	-0.2070	0.1231	0.0097
ERMclus2F1	Mixture	0.0903	0.0035	0.0421	-0.0472	0.1167
ERMclus3F1	**Reinsurance ceded**	-0.4959	0.5127	0.0413	0.3091	0.5803
ERMclus3F2	**Capital management**	-0.7470	-0.4706	0.2031	-0.3146	-0.2107
ERMclus4F1	**Life ALM**	0.3505	-0.3994	-0.6143	0.3632	0.0942
ERMclus4F2	**Monitoring (inspections and medical exams)**	0.1448	-0.0282	-0.2146	0.2499	-0.1243
ERMclus5F1	**Health ALM**	-0.2410	0.7747	0.2156	-0.0500	-0.3546
ERMclus5F2	**Maintenance reserve**	-0.3208	-0.2089	0.2089	-0.0454	0.1230
ERMclus6F1	**Asset allocation and reserve strategy**	-0.1884	-0.2794	0.5089	0.7208	-0.2118
ERMclus7F1	Mixture	0.2725	-0.0284	0.1377	-0.0894	0.0275
ERMclus7F2	Mixture	0.0526	-0.1689	0.1795	-0.2429	0.1332
ERMclus8F1	Mixture	-0.1447	-0.1391	-0.0050	0.0136	0.0271
ERMclus8F2	Mixture	-0.0094	0.0632	-0.0370	0.0468	0.0139

TABLE 5B
Correlations Between the Risk Factors and their Canonical Variates

Factor	Theme	RISK1	RISK2	RISK3	RISK4	RISK5
RISKclus1F1	**Liquidity and credit - asset risk**	0.7715	-0.0901	0.5400	-0.2154	0.0888
RISKclus1F2	**Life risks: policy loans; reserves; death benefits - product risk**	0.1094	-0.0417	-0.2108	0.2750	-0.0240
RISKclus1F3	**Reserves risk**	0.4563	-0.1071	-0.5074	0.2839	0.1297
RISKclus2F1	**Claims settlements**	-0.8147	0.4712	0.1173	0.0312	-0.0739
RISKclus2F2	**Product (health)/Operational (Commission)**	0.1381	0.8868	0.0513	0.0597	-0.3050
RISKclus3F1	Mixture	0.0107	-0.2530	-0.4809	0.3381	0.0113
RISKclus3F2	Mixture	0.0565	-0.0786	-0.0063	0.2725	-0.0690
RISKclus4F1	**Reinsurance assumed**	-0.1488	0.2988	0.0840	0.3785	0.5163
RISKclus4F2	**Commission on reinsurance ceded**	0.0186	0.3696	-0.0632	0.3069	0.5735
RISKclus5F1	Mixture	-0.0837	0.1605	-0.0657	-0.0263	-0.2833
RISKclus5F2	Mixture	0.0338	0.0280	0.0091	-0.0635	0.0302
RISKclus5F3	Mixture	0.0433	-0.1208	-0.2136	0.1132	-0.0235
RISKclus6F1	Mixture	-0.1131	-0.1454	0.0957	-0.1971	0.1637
RISKclus6F2	Mixture	0.1571	0.2512	-0.0029	-0.0126	0.0421
RISKclus6F3	Mixture	-0.1312	-0.0891	-0.0628	0.1091	0.1525
RISKclus7F1	**Operational expenses**	0.1690	0.0732	0.0004	0.1270	-0.3551
RISKclus7F2	**Actuarial expenses**	-0.3405	-0.1327	-0.1855	-0.0182	0.2639
RISKclus8F1	**Asset risks**	-0.3419	-0.3705	0.5421	0.5899	-0.2254

Interpretation

The first dimension (ERM1-RISK1) explains 41 percent of the interrelationship, and the associated canonical pairs are closely related (R-square = 0.88) as the plot in Figure 2 demonstrates. Insurers with high scores on RISK1 tend to be large with large holdings of illiquid privately placed assets and low levels of claims. Insurers with low scores on RISK1 tend to be small, with high liquidity and high bonds credit but also high claims exposures through risky products. On the ERM1 side, high scorers tend to be sophisticated (use derivatives), larger in size and employ lower financial leverage in capital management, and cede less reinsurance to manage risk. Low scorers on ERM1 have opposite characteristics. The pairing of these risk and tool characteristics on the ERM1-RISK1 dimension suggests a dimension characterized by reliance upon sophistication both in capital and derivatives management with exploitation of size on the ERM side while taking more asset risk and less product risk on the risk map side.

The second dimension of the Risk-ERM interrelationship (ERM2-RISK2) emphasizes health ALM, reinsurance and capital management (more leverage) tools paired with a mix of product risk and operational risk in commissions. Insurers that score high on RISK2 have high disability benefits and commissions on deposit funds (which is the only place where operational risk appears in this interrelationship). Insurers that score high on ERM2 deploy health ALM and reinsurance tools, but use more leverage. The second dimension of the Risk-ERM interrelationship appears to be a product dimension on the risk side, with small operational contributions, while on the ERM side it overlaps all functions in both health ALM and capital management.

The third dimension (ERM3-RISK3) emphasizes asset risks on the Risk side and asset risk management tools on the ERM side. We find a recurrence of firms with illiquid private placements and asset risk overall on the high side of RISK3, together with size and sophistication on the high side of ERM3. But on the high end of RISK3, we also find firms with high overall asset risk and some product risk, together with low reserves. And on the high side of ERM3, we add firms with significant asset allocation and reserve measures (product risk) coupled with low ALM for life products.

The fourth and fifth dimensions each explain about 5 percent of the RISK-ERM interrelationship. Their interpretations are fairly straightforward. The fourth dimension pairs asset risks with asset allocation and reserve strategies. The fifth relates reinsurance risks (assumed) with reinsurance tools (ceded).

We emphasize that each canonical pair (dimension) of the interrelationship is orthogonal to every other pair and therefore provides a separate and distinct perspective on a different aspect of the interrelationship. Together, these five dimensions explain about 93 percent of the interrelationship. To be sure, each side of the RISK-ERM interrelationship has been simplified through the selection of the most important factors on each side (14 for ERM and 18 for RISK). Conceivably, a different picture could emerge through the inclusion of more, or different, factors. However, the themes that emerge from the analysis are satisfyingly consistent. The theme of the most important dimension, ERM1-RISK1, is characterized by size, leverage and sophistication on the ERM side against high asset risk and low product risk. Insurers are placed along its risk dimension by their assumption (or not) of assets risks, and along its ERM dimension by their employment of sophisticated tools, including derivatives. Insurers are also placed on a second dimension that represents a mix of product and asset risks and corresponding tools. The third and fourth dimensions correspond to different aspects of asset risks and tools. And the fifth is a specific type of product risk and tool—reinsurance. Noteworthy is the presence on the ERM side of ALM tools for two of the three main products sold by this industry—life and health (ALM for annuities did not emerge in the relationship). Noticeable by its absence is any presence for operational risks (except in one factor) or tools. Although many operational risk variables and tools were included in the study, and operational risks/tools do play roles in certain clusters and factors, none emerges to assume control of a significant aspect of the ERM-RISK interrelationship, except in minor roles. Figure 4 below provides the visual mapping of insurers in each of the interrelationships described here. As the reader can see, the maps and the relationships are spectrums. Each insurer is positioned at a point in every RISK-ERM dimension. Thus, an insurer may use the plots in Figure 4 as a benchmark tool.

Figure 4
Interrelationships between the Risk Spectrums and ERM Tools Spectrums—Each Graph
Represented Some Themes of the Risk Map in Relationship to
Some Themes of the ERM Tools Map

ERM1 vs RISK1

Each point is one insurer
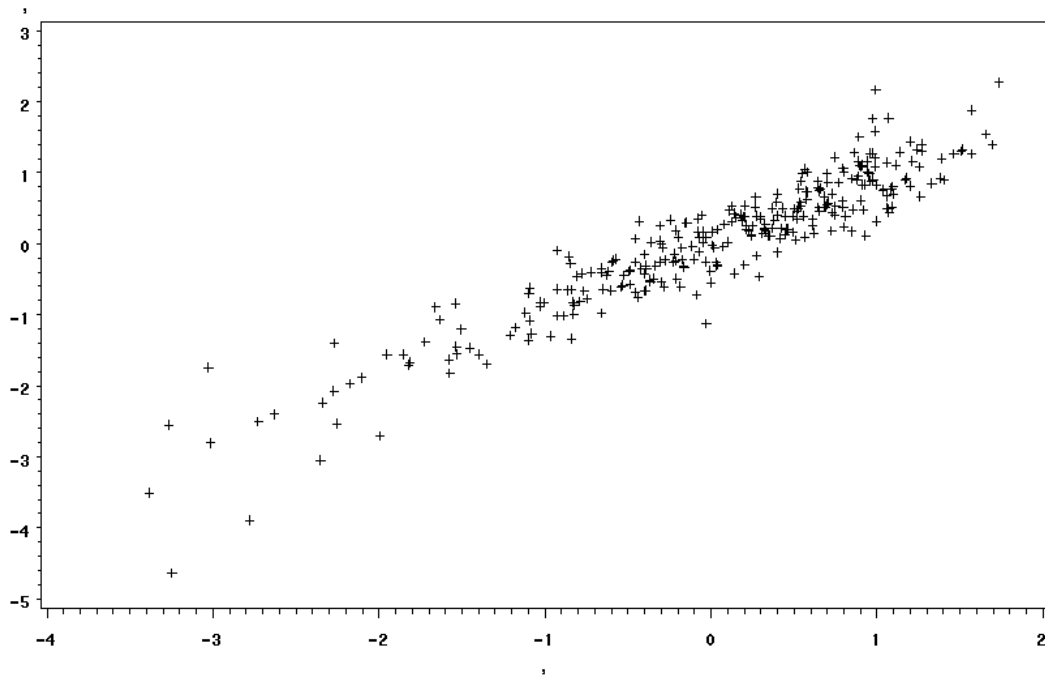
ERM2 vs RISK2

Each point is one insurer
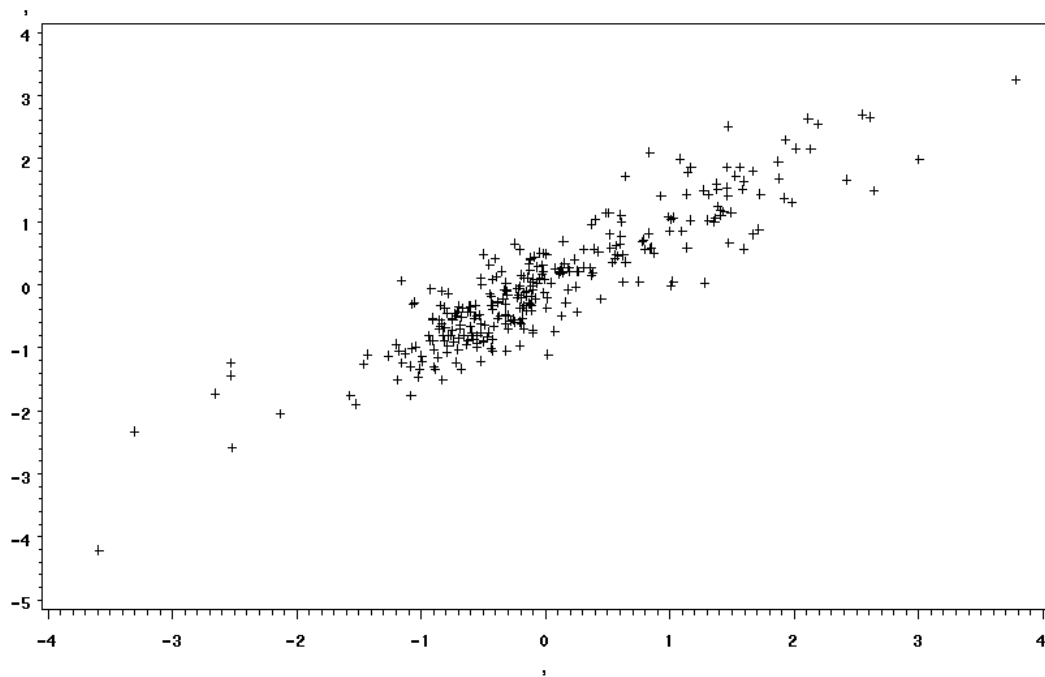
ERM3 vs RISK3
Each point is one insurer
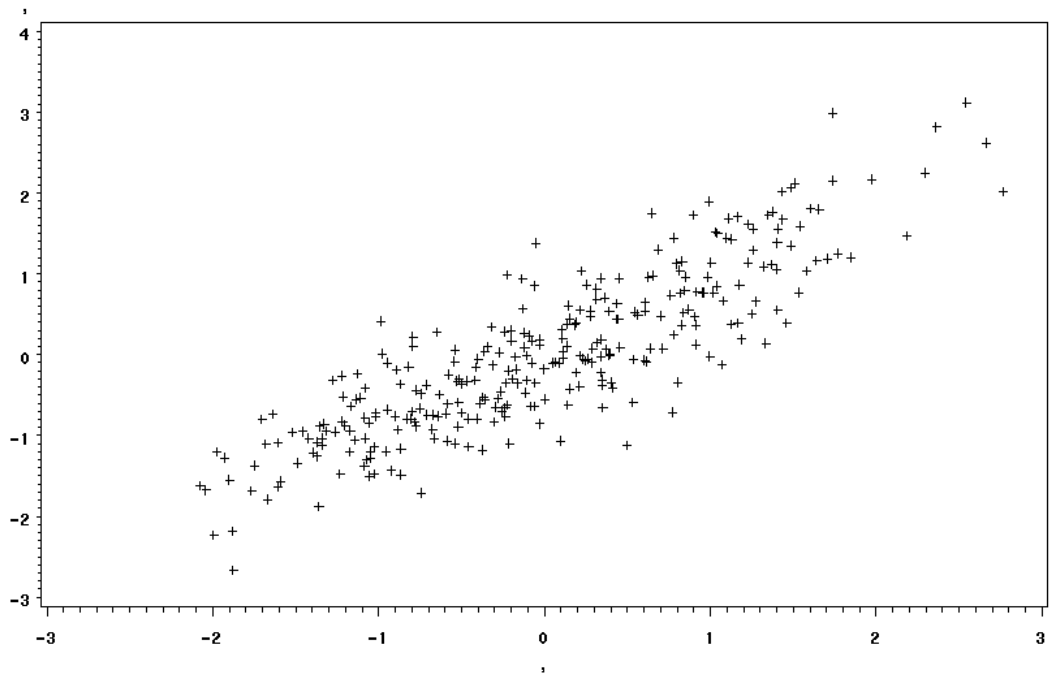
ERM4 vs RISK4
Each point is one insurer

24
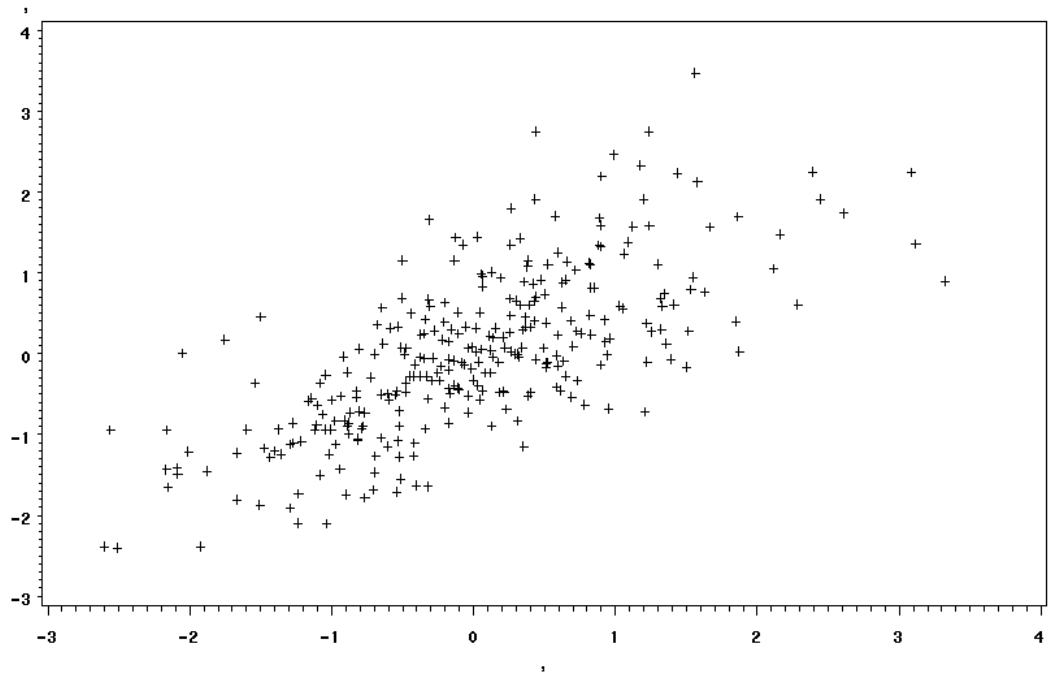
ERM5 vs RISK5
Each point is one insurer
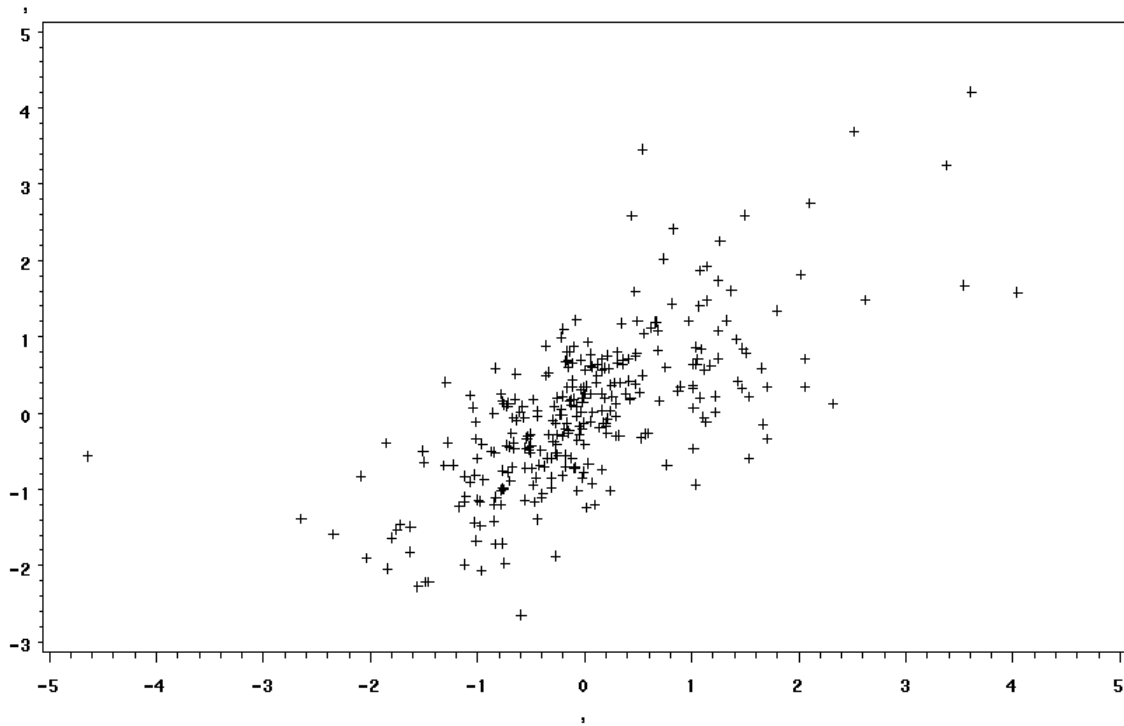
Summary and Significance of this Research

In this work, we expand Baranoff and Sager (2006) in two respects. Most importantly, we study the interrelationship between the structure of the risk universe of life insurers and the structure of their ERM tool universe, both as reflected in the objective data of their financial statements. Secondarily, we expand the risk and tool spaces by including additional risks and tools. We use the same methodology to map risks and tools: cluster analysis to group similar risks together and similar ERM tools together, followed by factor analysis of each cluster to characterize the themes of the clusters. Then we study how the risks and ERM tools correspond to each other. Both sides, risks and ERM tools, are multivariate. So we employ canonical correlation to study the interrelationship between the universe of risks and the universe of ERM tools. Other methodologies require directionality in the relationship (regression) or implicitly define both variable sets as functions of a common set of predictors (simultaneous equations). In addition, other methodologies could be overwhelmed by the number of relationships to specify. Canonical correlation avoids these difficulties. We selected 18 of the most important risk factors and 14 of the most important ERM tool factors to represent their respective maps and applied

25

canonical correlation to the factors. The first five dimensions (canonical variates) captured 93 percent of the RISK-ERM interrelationship. All yielded satisfying interpretations. The interrelationship is dominated by various aspects of asset risk and tool themes and by product risk and tool themes. Notably, the role of operational risk and tools is relatively minor and diffused among less important dimensions.

References

Baranoff, E. 2004a. *Risk Management and Insurance*. New York: John Wiley & Sons.

Baranoff, E.G. 2004b. "Mapping the Evolution of Risk Management." Contingencies, July/August : 22–27.

Baranoff, E.G. 2004c. "Risk Management—A Focus on Holistic Approach: Three Years After September 11." The Journal of Insurance Regulation, July.

Baranoff, E.G., and Sager, T.W. 2006. "Integrated Risk Management in Life Insurance Companies," Geneva Papers, Special Issue, July.

Baranoff, E.G., Sager, T.W., and Shively, T. 2004. "Managing Capital Structure: The Case of Life Insurers—A Semiparametric Simultaneous Equations Approach." Presentation at the Risk Theory Seminar.

Baranoff, E.G., and Sager, T.W. 2003. "The Interrelationship among Organizational and Distribution Forms and Capital and Asset Risk Structures in the Life Insurance Industry." Journal of Risk and Insurance 70(3): 375–400.

Baranoff, E.G., and Sager, T.W. 2002. "The Relations among Asset Risk, Product Risk, and Capital in the Life Insurance Industry." Journal of Banking and Finance 26: 1181–1197.

Bowers, B. 2003. An Interview for A. M. Best publications: "In the Spotlight: Professor Says New Risk Management Textbook Connects With Holistic Problem Solving" *BestWeek*, the week of Sept. 2, 2003, *BestDay News* on Sept. 2, 2003 and "Greater Than the Sum of the Parts," *Best's Review,* November 2003.

Cummins, J.D., and Sommer, D.W. 1996, "Capital and Risk in Property-Liability Insurance Markets." Journal of Banking & Finance 20: 1069–1092.

Santomero, A.M., and Babbel, D.F. 1997. "Financial Risk Management by Insurers: An Analysis of the Process." Journal of Risk and Insurance 64(2): 231– 270.

Shrieves, R., and Dahl, D. 1992. "The Relationship Between Risk and Capital in Commercial Banks." Journal of Banking & Finance 16: 439–457.

Appendix

Summary Statistics of all Variables Used in This Study

Variable	Label	N	Mean	Median	Std Dev
LAtotal	Total assets (p.3)	703	17.7851	17.3479	2.5889
LWtotal		703	16.2014	16.3632	3.1889
LAInvestedAssets		703	17.5810	17.1364	2.4661
LpBond1Private		703	-4.0905	-4.6052	0.8519
LpBond2Private		703	-4.2260	-4.6052	0.7341
LpBond3Private		703	-4.4994	-4.6052	0.2894
LpBond4Private		703	-4.5452	-4.6052	0.1937
LpBond5Private		703	-4.5568	-4.6052	0.1846
LpBond6Private		703	-4.5909	-4.6052	0.0879
LpBprivate		703	-3.9033	-4.6052	1.0753
LpRcapital		703	-3.4047	-3.5933	0.7923
Plife	Life writings / Total writings	703	0.3793	0.1898	0.4029
Phealth	Health writings / Total writings	703	0.2828	0.0005	0.3942
Pannuity	Annuity writings / Total writings	703	0.1418	0.0000	0.3014
Preinsur	Reinsurance writings / Total writings	703	0.1961	0.0000	0.3634
Lpgov1		703	-3.4127	-3.8238	1.2614
Lpgov2		703	-3.1042	-3.1933	1.2877
Lpgov3		703	-0.9395	-1.0087	0.2154
Lpgov4		703	-3.9298	-4.5070	1.0023
Lpgov5		703	-2.1688	-2.2759	0.2804
LpmuniHI		703	-2.9888	-2.9229	1.4351
LpmuniLO		703	-4.6005	-4.6052	0.0355
Lputil		703	-3.7547	-4.0581	0.9433
Lpcorp12		703	-1.8210	-1.1950	1.5084
Lpcorp3		703	-4.2241	-4.6052	0.5913
Lpcorp4		703	-4.3822	-4.6052	0.4339
Lpcorp56		703	-4.4822	-4.6052	0.3067
LpTCE		695	1.5496	1.5390	0.2643
LRBCratio		672	6.5162	6.1962	1.3421
RBCind	Indicator for RBCratio > 125	672	0.9643	1.0000	0.1857
LRetOnCap		673	1.3176	1.3294	0.2532
LCAP		703	-1.3625	-1.0654	1.1415
LRatingDate		696	7.2935	7.3032	0.4745
LBestLikert		374	-0.7281	-1.1019	1.4066
LpRegARisk		703	-3.6791	-3.9469	0.7755
LpOppARisk		703	-4.3267	-4.3980	0.2455
LpACommonStock		703	-3.6577	-4.5946	1.3088
LpACash		703	-0.7595	-0.8845	0.3520
LpAShortTerm		703	-4.2282	-4.6052	0.8448
LpARealEstateOccupiedEncumber		703	-4.5942	-4.6052	0.1289
LpAPolicyLoans		703	-4.2245	-4.6052	0.6856
LpARecoverableReins		703	-4.1735	-4.3355	0.4245
LpAOtherReceivReins		703	-2.8230	-2.8805	0.2126
LpAComputersSoftware		703	-4.5523	-4.6052	0.1469
LpATaxFederalForeign		703	-3.4623	-3.5604	0.2875
LpANetDeferredTaxAsset		703	-3.5292	-3.6133	0.2105
LpADeferPremAgentBal		703	-3.6412	-3.8038	0.3840
LpAAdjustForeignExch		703	-4.6013	-4.6052	0.0814

28

Variable	Label	N	Mean	Median	Std Dev
LpAReceivParentSubsid		703	-4.3507	-4.6051	0.5977
LpAOtherNonadmitAssets		703	-4.4753	-4.4753	0.0057
LpAWriteInNotInvAssets		703	-3.7667	-3.9893	0.5433
LpASeparateAccounts		703	-4.2050	-4.6052	1.1641
pLReserveLife		703	0.4659	0.4831	0.3753
LpLReserveHealth		703	-3.5580	-4.6052	1.4560
LpLDepositContracts		703	-4.1525	-4.6052	0.9246
LpLContractClaimsLife		703	-3.8913	-4.1922	0.8599
LpLContractClaimsHealth		703	-3.5242	-4.5653	1.4672
LpLSurrenderCanceledContracts		703	-4.5763	-4.5889	0.1521
LpLExperienceRatingRefunds		703	-3.9839	-4.0803	0.4127
LpLOtherPayableReinsurance		703	-4.2346	-4.3702	0.5191
LpLInterestMaintReserve		703	-3.5910	-3.8343	0.5996
LpLAgentCommissionsDue		703	-3.6995	-3.8384	0.3287
LpLReinsurAssumedCommExpAllow		703	0.0608	0.0644	0.1772
LpLGeneralExpensesDue		703	-3.6298	-3.9570	0.7026
LpLTransferSeparateAccounts		703	4.0696	4.1143	0.1851
LpLTaxFeesNotFederal		703	-0.8260	-0.8382	0.1586
LpLTaxFederalForeign		703	-2.8498	-3.0545	0.4997
LpLTaxFederalForeignCurrent		703	-2.2086	-2.3066	0.3192
LpLNetDeferredTax		703	-4.4897	-4.6052	0.4815
LpLRetainedAsAgent		703	-3.9220	-4.0139	0.3161
LpLHeldForAgents		703	-4.0045	-4.0495	0.2215
LpLAdjAssetLiabForeignExchRate		703	-4.6018	-4.6052	0.0530
LpLOtherEmployeeAgentBenefits		703	-4.5716	-4.6020	0.1757
LpLAssetValuationReserve		703	-3.9440	-4.2256	0.7870
LpLFundsHeldUnauthReinsur		703	-4.4902	-4.6049	0.5734
LpLPayableParentSubsidAffil		703	-3.3214	-3.6143	0.6521
LpLSeparateAccounts		703	-4.1896	-4.6052	1.2031
LpLCommonStock		703	-2.6064	-3.0081	1.8788
LpLPreferredStock		703	-4.5298	-4.6052	0.4588
LpLWriteInExSurplusFunds		703	-3.5019	-3.5763	0.4975
LpLSurplusNotes		703	-4.3280	-4.6052	1.0310
LpLPaidSurplus		703	-0.8103	-1.3700	1.3910
LpLWriteInSurplusFunds		703	-1.4485	-1.4736	0.2665
pLUnassignedSurplusFunds		703	0.9034	0.1087	16.9689
LpLTreasuryStockCommon		703	-4.5390	-4.6052	0.4502
LpLTreasuryStockPreferred		703	-4.6043	-4.6052	0.0200
LpLSurplus		703	1.7887	1.6176	0.5682
LpLCapitalSurplus		703	-0.5169	-0.5995	1.7833
LpSAmortInterestMaintReserve		703	-1.8092	-1.8264	0.1307
LpSCommissionsExpReinsCeded		703	-0.9688	-1.1768	0.4668
LpSReserveAdjustReinsCeded		703	1.3317	1.3358	0.2528
LpSIncomeInvestManageSepAccts		703	-4.3742	-4.6040	0.7872
LpSDeathBenefits		703	-1.7859	-2.0801	0.8679
LpSMaturedEndowments		703	-4.0654	-4.0932	0.1381
LpSAnnuityBenefits		703	-2.3673	-2.7098	0.7185
LpSDisabilityAccHealthBenefits		703	0.0775	-0.2158	0.6144
LpSCouponsGuarPureEndowments		703	-4.5533	-4.5609	0.1028
LpSSurrenderBenefits		703	-2.7900	-3.5856	1.3227
LpSGroupConversions		703	-4.2095	-4.2128	0.0311
LpSInterestContractDepositType		703	-1.0461	-1.0671	0.1681

Variable	Label	N	Mean	Median	Std Dev
LpSPaymentsSupplContracts		703	-4.4442	-4.5290	0.3000
LpSIncreaseReservesLifeAccHealth		703	3.3678	3.3729	0.3045
LpSTotalL10_19		703	3.2159	3.2010	0.3064
LpSCommissOnPremDepositType		703	-2.4278	-2.3541	1.4480
LpSCommissExpOnReinsurAssumed		703	-0.9606	-1.0795	0.3682
LpSSurplusWithdrawSepAccts		703	-1.9967	-1.9984	0.0436
pSOtherChangeSurplusSepAccts		703	-0.0004	0.0000	0.0073
pSChangeSurplusNotes		703	0.0012	0.0000	0.0839
pSChangeAccountingPrinciples		703	-0.0019	0.0000	0.0290
LpSChangeCapitalPaidIn		703	-1.1431	-1.1529	0.1042
LpSChangeCapitalTransFromSurplus		703	-4.5963	-4.6052	0.1484
pSChangeCapitalTransToSurplus		703	-0.0002	0.0000	0.0044
LpSChangeSurplusPaidIn		703	1.2227	1.2221	0.2245
LpSChangeSurplusTransToCapital		703	4.5961	4.6049	0.1484
LpSChangeSurplusTransFromCapital		703	4.2334	4.2435	0.2023
LpSChangeSurplusForReinsur		703	-0.9501	-0.9574	0.2100
LpSNetChangeCapitalSurplus		703	-0.2226	-0.2324	0.2825
LpCommExpReinsurCeded		530	-0.2094	-0.6902	1.0078
LpCommExpReinsurAssumed		530	-0.2676	-0.6180	1.1706
LpCommExpReinsurDiffCed_Ass		530	-7.0746	-7.0861	0.5230
pCommDirectFirstYrNotSingle		530	0.3247	0.1752	0.3553
pCommDirectFirstYrSingle		530	0.1769	0.0000	0.3445
pCommDirectRenewal		530	0.4790	0.3928	0.4020
LpCommDirectDepositType		530	-4.3927	-4.5402	0.6966
LpExRent		695	-2.6827	-2.6550	0.6168
LpExSalaries		695	-1.5291	-0.9371	1.5055
LpExEmployBenefitPlans		695	1.4672	1.4681	0.2497
LpExAgentBenefitPlans		695	-3.9003	-3.9638	0.2745
LpExEmpNonfundedBenefitPlans		695	-4.1381	-4.1688	0.1814
LpExAgentNonfundedBenefitPlans		695	-3.8907	-3.8941	0.0368
LpExOtherEmployWelfare		695	-2.4634	-2.5650	0.3122
LpExOtherAgentWelfare		695	-3.9963	-4.0182	0.1297
LpExLegal		695	1.5241	1.5272	0.2344
LpExCPAActuaries		695	-1.7352	-1.9269	0.5616
LpExInvestigateSettleClaims		695	-2.1186	-2.1716	0.1714
LpExTravel		695	-3.8316	-3.8834	0.7243
LpExAdvertising		695	-3.7111	-4.0486	0.7355
LpExPhonePostage		695	-3.4050	-3.3365	0.8233
LpExPrintingStationery		695	-1.6022	-1.6536	0.2712
LpExDeprecFurnitureEquip		695	-3.7636	-3.9612	0.6665
LpExRentEquipment		695	-3.9073	-4.1838	0.6370
LpExDeprecComputersSoftware		695	-2.7873	-3.0377	0.5012
LpExBooksPeriodicals		695	-4.4139	-4.5192	0.3828
LpExBureauAssocFees		695	-3.8396	-3.9536	0.3872
LpExInsuranceNotRealEstate		695	-3.3068	-3.4619	0.4511
pExMiscLosses		695	0.0010	0.0000	0.0246
LpExCollectionBankFees		695	-2.8374	-2.9547	0.3719
LpExMiscGeneralExpenses		695	0.0602	0.0367	0.2327
LpExGroupServiceAdminFees		695	1.6509	1.6423	0.2750
LpExReimburseByUninsurAccHealth		695	4.2250	4.3832	0.7415
LpExAgencyExpenseAllow		695	-2.8889	-2.9841	0.3639
LpExGrossAgentBalChargeoff		695	-1.3977	-1.4053	0.2116

Variable	Label	N	Mean	Median	Std Dev
LpExAgencyConferences		695	-3.8263	-3.9607	0.4454
LpExRealEstateExpense		695	-3.1985	-3.3421	0.3863
LpExOtherInvestExpense		695	-1.2453	-1.3445	0.2727
LpClaimsDirectEndThisYr		703	-3.1153	-3.7642	1.5460
LpClaimsReinsAssEndThisYr		703	-4.0127	-4.5112	1.0071
LifeTOTALlogPolNChange		603	-0.0392	-0.0328	0.5397
HealthTOTALlogPolNChange		363	-0.0512	-0.0419	0.6999
AnnORDlogNChange		262	-0.0023	-0.0029	0.4772
LpLifeTOTALAmtSurrender		611	-3.7079	-4.1155	1.1096
LpLifeTOTALNSurrender		610	-3.7044	-4.0915	1.1047
Performance		703	0.0656	0.0557	0.0984
LpClaimsTOTALSettleDuringYr		703	-0.2836	-0.7013	0.9476
XpClaimsTOTALLiabPaidDuringYr		703	0.0316	0.1016	0.4107
XpClaimsTOTALRecovReinsDuringYr		703	0.0050	0.0000	0.1809
LpClaimsTOTALBenefitsDuringYr		703	0.8042	0.5881	0.5883
LpExMedicalExams		695	-3.4669	-3.6599	0.5247
LpExInspectionReports		695	-4.4565	-4.5828	0.3925
LpClaimsReinsCededEndThisYr		703	-3.8997	-4.5366	1.1596
LpClaimsLiabReinsCededDec31		703	-3.9037	-4.5367	1.1569
LpClRecovableFromReinsDec31		703	-4.2991	-4.5269	0.5885
LpClaimsLiabReinsCededEndLastYr		703	-3.9282	-4.5420	1.1560
LpClRecovableFromReinsEndLastYr		703	-4.3536	-4.5821	0.5957
LpClBenefitsReinsCededIncThisYr		703	0.5297	0.4427	0.3508
LpLBorrowedMoney		703	-4.5060	-4.6052	0.5048
LpSGeneralInsurExpenses		703	-0.5611	-0.6348	0.4349
LpSTaxFederalForeign		703	0.2315	0.2248	0.1958
pSChangeLiabReinsurUnauthCo		703	0.0003	0.0000	0.0104
pSChangeReserveForValuationBasis		703	0.0006	0.0000	0.0358
pSChangeAssetValuationReserve		703	-0.0092	-0.0006	0.0362
LRTotcap		703	15.7201	16.2515	4.7381
Tstates	# states of licensure	703	18.2589	5.0000	20.3965
LDeriv_TotalBookValue		703	15.3875	15.3515	0.8456
LpDeriv_TotalBookValue		703	-4.5092	-4.5260	0.1215
LLTotalLiabilities		703	16.9996	16.6927	3.2075
LExTOTALGeneralExpense		703	17.3112	17.0729	1.0247
IndDeriv	Indicator of derivative activity (1=Yes)	703	0.0910	0.0000	0.2879
Ntype	Org type (1=stock)	703	0.9346	1.0000	0.2475
Ngroup	Indicator for member of group (1=yes)	703	0.7041	1.0000	0.4568
LifeTOTALlogPriceChange		519	-0.0265	-0.0093	0.4723
HealthTOTALlogPriceChange		304	0.0118	0.0293	0.8357
LpLife_ALM_1		668	-1.4610	-0.7350	1.9803
LpLife_ALM_2		668	-3.8663	-4.1671	0.9453
LpLife_ALM_3		547	0.3853	1.1020	2.7397
LpLife_ALM_4		547	-2.7534	-3.1018	1.7960
LpHealth_ALM_1		684	-3.0410	-4.6052	2.1762
LpHealth_ALM_2		684	-3.0823	-4.4338	1.9518
LpHealth_ALM_3		610	-2.6750	-4.6052	2.6262
LpHealth_ALM_4		610	-2.7310	-3.8991	2.2863
LpAnnuities_ALM		619	-3.9797	-4.6052	1.1582
LpIntMaintReserve_ALM		662	-3.5909	-3.7593	0.4946
LpAssetValuationReserve_ALM		703	-4.1333	-4.3427	0.5339

Variable	Label	N	Mean	Median	Std Dev
LActiveIndex1		624	-3.6839	-3.9895	0.9909
LActiveIndex2		640	-3.7026	-3.9893	0.9625
LActiveIndex3		644	-3.5567	-3.8294	1.0254
LpClSettleReinsCededIncThisYr		703	-0.8590	-1.0974	0.6069
XpClaimsTOTALReinsCededDuringYr		703	0.0082	0.0000	0.2495
XpClBenefitsReinsCededIncThisYr		703	0.3164	0.2491	0.3822
LAtotal	Total assets (p.3)	302	20.8083	20.7677	2.1864
LWtotal		302	19.1653	19.1313	2.0236
LAInvestedAssets		302	20.6122	20.5326	2.0759
LpBond1Private		302	-3.2804	-3.1298	0.8922
LpBond2Private		302	-3.4588	-3.4007	0.9314
LpBond3Private		302	-4.2413	-4.4184	0.4235
LpBond4Private		302	-4.4123	-4.5628	0.2642
LpBond5Private		302	-4.4715	-4.6052	0.1998
LpBond6Private		302	-4.5480	-4.6052	0.1246
LpBprivate		302	-2.7934	-2.5461	1.1302
LpRcapital		302	-3.6227	-3.7553	0.4287
Plife	Life writings / Total writings	302	0.3950	0.3296	0.3156
Phealth	Health writings / Total writings	302	0.2835	0.1048	0.3236
Pannuity	Annuity writings / Total writings	302	0.2391	0.0774	0.3019
Preinsur	Reinsurance writings / Total writings	302	0.0825	0.0160	0.1639
Lpgov1		302	-3.8793	-4.1322	0.7518
Lpgov2		302	-3.5199	-3.5987	0.7714
Lpgov3		302	-0.9696	-1.0011	0.0930
Lpgov4		302	-3.9003	-4.1384	0.7489
Lpgov5		302	-2.1895	-2.2542	0.1619
LpmuniHI		302	-2.2302	-2.0434	0.9149
LpmuniLO		302	-4.5943	-4.6052	0.0522
Lputil		302	-2.9949	-2.9075	0.7405
Lpcorp12		302	-0.8332	-0.6885	0.5790
Lpcorp3		302	-3.6845	-3.5599	0.5732
Lpcorp4		302	-4.0473	-4.0359	0.4524
Lpcorp56		302	-4.2777	-4.3313	0.3206
LpTCE		302	1.5416	1.5377	0.0164
LRBCratio		302	5.9917	5.8888	0.5542
RBCind	Indicator for RBCratio > 125	302	0.9934	1.0000	0.0812
LRetOnCap		302	1.3368	1.3363	0.0474
LCAP		302	-1.9939	-2.0839	0.7065
LRatingDate		302	7.3252	7.3119	0.1022
LBestLikert		302	-0.3619	-0.6981	1.7569
LpRegARisk		302	-3.5691	-3.6783	0.5073
LpOppARisk		302	-4.3689	-4.4010	0.1401
LpACommonStock		302	-3.5546	-3.7542	1.0332
LpACash		302	-0.9065	-0.9268	0.0754
LpAShortTerm		302	-4.2649	-4.6052	0.6453
LpARealEstateOccupiedEncumber		302	-4.6025	-4.6052	0.0284
LpAPolicyLoans		302	-3.4998	-3.5354	0.7396
LpARecoverableReins		302	-4.1984	-4.2931	0.2400
LpAOtherReceivReins		302	-2.8445	-2.8761	0.0977
LpAComputersSoftware		302	-4.5703	-4.6025	0.0844
LpATaxFederalForeign		302	-3.4190	-3.4806	0.2049
LpANetDeferredTaxAsset		302	-3.4585	-3.5107	0.1702

Variable	Label	N	Mean	Median	Std Dev
LpADeferPremAgentBal		302	-3.5210	-3.6621	0.3681
LpAAdjustForeignExch		302	-4.6051	-4.6052	0.0007
LpAReceivParentSubsid		302	-4.4198	-4.5742	0.3397
LpAOtherNonadmitAssets		302	-4.4732	-4.4753	0.0228
LpAWriteInNotInvAssets		302	-3.8763	-3.9748	0.2739
LpASeparateAccounts		302	-3.5386	-4.6052	1.5110
pLReserveLife		302	0.6210	0.6795	0.2644
LpLReserveHealth		302	-3.3993	-3.9142	1.3027
LpLDepositContracts		302	-3.4071	-3.5088	0.9694
LpLContractClaimsLife		302	-4.0527	-4.1632	0.4681
LpLContractClaimsHealth		302	-3.8600	-4.4269	1.0362
LpLSurrenderCanceledContracts		302	-4.5853	-4.5889	0.0277
LpLExperienceRatingRefunds		302	-4.0438	-4.0803	0.1411
LpLOtherPayableReinsurance		302	-4.2557	-4.3702	0.3218
LpLInterestMaintReserve		302	-3.6600	-3.7312	0.2953
LpLAgentCommissionsDue		302	-3.7499	-3.8183	0.1871
LpLReinsurAssumedCommExpAllow		302	0.0650	0.0644	0.0033
LpLGeneralExpensesDue		302	-3.8159	-3.9440	0.3702
LpLTransferSeparateAccounts		302	4.0238	4.1143	0.2214
LpLTaxFeesNotFederal		302	-0.8340	-0.8376	0.0119
LpLTaxFederalForeign		302	-2.9797	-3.0464	0.2020
LpLTaxFederalForeignCurrent		302	-2.2756	-2.3030	0.0916
LpLNetDeferredTax		302	-4.5615	-4.6052	0.2752
LpLRetainedAsAgent		302	-3.9074	-3.9924	0.2455
LpLHeldForAgents		302	-3.9929	-4.0466	0.1794
LpLAdjAssetLiabForeignExchRate		302	-4.5894	-4.6052	0.1371
LpLOtherEmployeeAgentBenefits		302	-4.5235	-4.6020	0.2300
LpLAssetValuationReserve		302	-4.0365	-4.1442	0.4971
LpLFundsHeldUnauthReinsur		302	-4.4553	-4.6049	0.5927
LpLPayableParentSubsidAffil		302	-3.5024	-3.5927	0.2476
LpLSeparateAccounts		302	-3.5009	-4.6052	1.5481
LpLCommonStock		302	-3.9847	-4.3123	0.7442
LpLPreferredStock		302	-4.5450	-4.6052	0.2980
LpLWriteInExSurplusFunds		302	-3.5643	-3.5763	0.1056
LpLSurplusNotes		302	-4.4612	-4.6052	0.3518
LpLPaidSurplus		302	-1.5173	-1.6955	0.5092
LpLWriteInSurplusFunds		302	-1.4645	-1.4736	0.0726
pLUnassignedSurplusFunds		302	0.1243	0.0559	0.3807
LpLTreasuryStockCommon		302	-4.5820	-4.6052	0.1479
LpLTreasuryStockPreferred		302	-4.6050	-4.6052	0.0024
LpLSurplus		302	1.5744	1.5495	0.0891
LpLCapitalSurplus		302	-1.9453	-2.1057	0.9873
LpSAmortInterestMaintReserve		302	-1.7876	-1.8004	0.0671
LpSCommissionsExpReinsCeded		302	-0.9356	-1.0954	0.4559
LpSReserveAdjustReinsCeded		302	1.3388	1.3358	0.0833
LpSIncomeInvestManageSepAccts		302	-4.1467	-4.6040	0.9002
LpSDeathBenefits		302	-1.3508	-1.4057	0.7241
LpSMaturedEndowments		302	-3.9800	-4.0691	0.2137
LpSAnnuityBenefits		302	-1.9754	-2.2035	0.7670
LpSDisabilityAccHealthBenefits		302	0.1058	-0.1564	0.4845
LpSCouponsGuarPureEndowments		302	-4.5469	-4.5609	0.1041
LpSSurrenderBenefits		302	-1.5095	-1.5457	1.2866

Variable	Label	N	Mean	Median	Std Dev
LpSGroupConversions		302	-4.2109	-4.2128	0.0419
LpSInterestContractDepositType		302	-0.9995	-1.0494	0.1353
LpSPaymentsSupplContracts		302	-4.2111	-4.4589	0.4898
LpSIncreaseReservesLifeAccHealth		302	3.3870	3.3812	0.0331
LpSTotalL10_19		302	3.2490	3.2388	0.0578
LpSCommissOnPremDepositType		302	-1.7399	-1.7081	1.0905
LpSCommissExpOnReinsurAssumed		302	-1.0073	-1.0766	0.1794
LpSSurplusWithdrawSepAccts		302	-2.0023	-1.9984	0.1559
pSOtherChangeSurplusSepAccts		302	0.0000	0.0000	0.0096
pSChangeSurplusNotes		302	-0.0026	0.0000	0.0850
pSChangeAccountingPrinciples		302	0.0000	0.0000	0.0028
LpSChangeCapitalPaidIn		302	-1.1578	-1.1529	0.2076
LpSChangeCapitalTransFromSurplus		302	-4.5999	-4.6052	0.0645
pSChangeCapitalTransToSurplus		302	-0.0001	0.0000	0.0012
LpSChangeSurplusPaidIn		302	1.2334	1.2221	0.0363
LpSChangeSurplusTransToCapital		302	4.5955	4.6049	0.0983
LpSChangeSurplusTransFromCapital		302	4.2279	4.2435	0.2714
LpSChangeSurplusForReinsur		302	-0.9592	-0.9574	0.0148
LpSNetChangeCapitalSurplus		302	-0.2029	-0.2022	0.1395
LpCommExpReinsurCeded		302	-0.1126	-0.3489	0.9837
LpCommExpReinsurAssumed		302	-0.3375	-0.6074	0.8100
LpCommExpReinsurDiffCed_Ass		302	-7.0703	-7.0860	0.2789
pCommDirectFirstYrNotSingle		302	0.4063	0.4271	0.2867
pCommDirectFirstYrSingle		302	0.1202	0.0048	0.2382
pCommDirectRenewal		302	0.4539	0.3949	0.3158
LpCommDirectDepositType		302	-4.2939	-4.5402	0.7810
LpExRent		302	-2.6068	-2.6118	0.4082
LpExSalaries		302	-0.9702	-0.8850	0.5767
LpExEmployBenefitPlans		302	1.4760	1.4735	0.0145
LpExAgentBenefitPlans		302	-3.7682	-3.9638	0.4312
LpExEmpNonfundedBenefitPlans		302	-4.0991	-4.1688	0.2730
LpExAgentNonfundedBenefitPlans		302	-3.8790	-3.8941	0.1211
LpExOtherEmployWelfare		302	-2.4637	-2.5181	0.1577
LpExOtherAgentWelfare		302	-3.9758	-4.0182	0.1826
LpExLegal		302	1.5311	1.5283	0.0113
LpExCPAActuaries		302	-1.9847	-2.0519	0.1799
LpExInvestigateSettleClaims		302	-2.0990	-2.1552	0.2310
LpExTravel		302	-3.6414	-3.6756	0.4660
LpExAdvertising		302	-3.4980	-3.7682	0.7798
LpExPhonePostage		302	-3.1773	-3.1847	0.5479
LpExPrintingStationery		302	-1.6368	-1.6533	0.2034
LpExDeprecFurnitureEquip		302	-3.6591	-3.7529	0.5386
LpExRentEquipment		302	-3.7099	-3.8555	0.5556
LpExDeprecComputersSoftware		302	-2.7294	-2.8292	0.3949
LpExBooksPeriodicals		302	-4.4359	-4.4902	0.1693
LpExBureauAssocFees		302	-3.8677	-3.8880	0.1558
LpExInsuranceNotRealEstate		302	-3.3113	-3.3852	0.2740
pExMiscLosses		302	0.0021	0.0000	0.0122
LpExCollectionBankFees		302	-2.8570	-2.9057	0.1730
LpExMiscGeneralExpenses		302	0.0576	0.0422	0.0648
LpExGroupServiceAdminFees		302	1.6509	1.6423	0.0335
LpExReimburseByUninsurAccHealth		302	4.1524	4.3832	0.9103

Variable	Label	N	Mean	Median	Std Dev
LpExAgencyExpenseAllow		302	-2.7561	-2.9841	0.4748
LpExGrossAgentBalChargeoff		302	-1.3965	-1.4053	0.0340
LpExAgencyConferences		302	-3.6183	-3.7742	0.4225
LpExRealEstateExpense		302	-3.0608	-3.2863	0.4278
LpExOtherInvestExpense		302	-1.2598	-1.3197	0.1508
LpClaimsDirectEndThisYr		302	-3.4040	-3.7670	1.0377
LpClaimsReinsAssEndThisYr		302	-4.2409	-4.4741	0.5081
LifeTOTALlogPolNChange		302	-0.0313	-0.0306	0.2559
HealthTOTALlogPolNChange		302	-0.0720	-0.0633	0.6567
AnnORDlogNChange		302	0.0426	-0.0124	0.6990
LpLifeTOTALAmtSurrender		302	-3.5818	-3.6846	0.6981
LpLifeTOTALNSurrender		302	-3.6187	-3.7069	0.7080
Performance		302	0.0673	0.0664	0.0205
LpClaimsTOTALSettleDuringYr		302	-0.6862	-0.8705	0.4582
XpClaimsTOTALLiabPaidDuringYr		302	0.0351	0.1302	0.2684
XpClaimsTOTALRecovReinsDuringYr		302	0.0011	0.0000	0.1673
LpClaimsTOTALBenefitsDuringYr		302	0.6189	0.5459	0.1792
LpExMedicalExams		302	-3.2251	-3.4039	0.4965
LpExInspectionReports		302	-4.3413	-4.4563	0.3165
LpClaimsReinsCededEndThisYr		302	-4.0436	-4.3808	0.7420
LpClaimsLiabReinsCededDec31		302	-4.0436	-4.3808	0.7420
LpClRecovableFromReinsDec31		302	-4.3424	-4.4723	0.3143
LpClaimsLiabReinsCededEndLastYr		302	-4.0268	-4.3811	0.7627
LpClRecovableFromReinsEndLastYr		302	-4.3800	-4.5328	0.3662
LpClBenefitsReinsCededIncThisYr		302	0.4775	0.4479	0.0940
LpLBorrowedMoney		302	-4.4427	-4.6052	0.4955
LpSGeneralInsurExpenses		302	-0.4579	-0.5260	0.3462
LpSTaxFederalForeign		302	0.2446	0.2394	0.0744
pSChangeLiabReinsurUnauthCo		302	0.0003	0.0000	0.0069
pSChangeReserveForValuationBasis		302	0.0011	0.0000	0.0233
pSChangeAssetValuationReserve		302	-0.0142	-0.0082	0.0399
LRTotcap		302	18.7157	18.6716	1.8373
Tstates	# states of licensure	302	39.2815	49.0000	17.6222
LDeriv_TotalBookValue		302	15.7183	15.3515	0.9735
LpDeriv_TotalBookValue		302	-4.4652	-4.5260	0.2043
LLTotalLiabilities		302	20.6122	20.5053	2.3014
LExTOTALGeneralExpense		302	18.0777	17.7043	0.9926
IndDeriv	Indicator of derivative activity (1=Yes)	302	0.3344	0.0000	0.4726
Ntype	Org type (1=stock)	302	0.8709	1.0000	0.3359
Ngroup	Indicator for member of group (1=yes)	302	0.8675	1.0000	0.3395
LifeTOTALlogPriceChange		302	0.0378	-0.0065	0.4995
HealthTOTALlogPriceChange		302	0.0606	0.0359	0.9943
LpLife_ALM_1		302	-0.4236	-0.1780	0.7131
LpLife_ALM_2		302	-3.9923	-4.1103	0.4845
LpLife_ALM_3		302	1.5643	1.5479	1.0955
LpLife_ALM_4		302	-2.7318	-2.9084	1.1477
LpHealth_ALM_1		302	-1.5152	-1.6385	2.2262
LpHealth_ALM_2		302	-2.5073	-2.9852	1.9138
LpHealth_ALM_3		302	-0.8509	-0.8597	2.6572
LpHealth_ALM_4		302	-1.8903	-2.1391	2.2985
LpAnnuities_ALM		302	-3.2666	-3.3823	1.0546

Variable	Label	N	Mean	Median	Std Dev
LpIntMaintReserve_ALM		302	-3.5904	-3.6407	0.2686
LpAssetValuationReserve_ALM		302	-4.0578	-4.1019	0.3826
LActiveIndex1		302	-3.6363	-3.8200	0.8000
LActiveIndex2		302	-3.7013	-3.7983	0.6535
LActiveIndex3		302	-3.3555	-3.3563	0.7713
LpClSettleReinsCededIncThisYr		302	-0.9722	-1.0716	0.2698
XpClaimsTOTALReinsCededDuringYr		302	-0.0226	0.0000	0.2066
XpClBenefitsReinsCededIncThisYr		302	0.3603	0.3318	0.2059

Etti G. Baranoff is associate professor of Finance and Insurance at the School of Business, Virginia Commonwealth University, in Richmond, Va. She can be reached at *ebaranof@vcu.edu*.

Thomas W. Sager is professor of Statistics in the Department of Information, Risk, and Operations Management at the University of Texas at Austin. He can be reached at *Tom.Sager@mccombs.utexas.edu*.