Enterprise Risk Management: A Developing Concept in Actuarial Science

An Honors Thesis (HONRS 499)

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ABSTRACT

With the economy as unstable as it is, business leaders are looking for new answers to avoid financial ruin. Many of them are finding a solution in Enterprise Risk Management. ERM is a process by which an organization manages risk over all lines of business as opposed to looking at how risk affects each department individually, in order to increase and sustain the company's value. This paper will serve as a guide to those wishing to learn the basic principles of this concept. By providing a thorough definition, information on current research in the field, and some real life examples of the benefits of ERM and the pitfalls of ignoring ERM, I hope to leave the reader with a foundation of the importance and the potentials an Enterprise Risk Management plan can have for any and all organizations.
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I. INTRODUCTION

Enterprise Risk Management (ERM) is a rapidly growing field for actuaries. As a graduating senior in the Actuarial Science department at Ball State University, I find this subject to be intriguing and believe that it holds a bright future for those interested in the field.

Actuaries are known for their work in risk forecasting. Until recently, they were typically employed with Life Insurance or Property and Casualty Insurance companies, predicting the frequency and severity of claims; others work for consulting firms helping clients create and reform health care and retirement benefit packages. However, in the past decade, the focus on developing ERM has increased dramatically.

Risk is present every day in every company and comes in many different forms. Corporations know this but haven’t clearly defined how to treat, reduce or transfer all of this risk. Every company insures most of their hazard risk, however, there are other types of risk that can affect a company’s financial stability and there are even some which, when used correctly, can positively affect assets or help decrease liabilities. ERM is the process of locating these risks and deciding how to manage them in terms of their impact on the entire enterprise as opposed to isolating the risk in separate sectors.

For example, every company has insured their building against fire or tornado damage and many have insured the threat of an employee being injured on the job. But what are CEO’s and CFO’s doing against financial risks such as foreign exchange rates rising and falling or operational risks such as the probability of a labor strike and the impact this could have on production. Some risks can even be used to decrease risks in other phases of business or magnify the rewards of other risks. Actuaries are trying to find and develop ways to quantify and measure these risks in order to maximize the earnings of entire organizations and minimize the probability of its failure.
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This paper will thoroughly define Enterprise Risk Management, identify the steps that are involved in implementing an ERM system, and recognize those who are working on this concept and what they are doing to further its development. This paper will also discuss Bear Stearns, an investment enterprise who could have used some of the Enterprise Risk Management principles to avoid the severe financial trouble they now find themselves in. Finally I will take a look at the steps one insurance company, Country Life, has taken to reduce their risk by implementing an ERM system.
II. DEFINING ENTERPRISE RISK MANAGEMENT

There are two large societies that actuaries in the United States belong to: The Society of Actuaries (SOA), and the Casualty Actuarial Society (CAS). Both societies have been doing extensive research on Enterprise Risk Management since the late 1990’s. In 2003 the CAS issued an official definition for ERM:

"ERM is the discipline by which an organization in any industry assesses, controls, exploits, finances, and monitors risks from all sources for the purpose of increasing the organization’s short- and long-term value to its stakeholders."

There are a few important ideas to focus on from this definition. First, it is essential to realize that this concept stretches across "any industry". As stated previously, actuaries are mostly known for their work in insurance and consulting industries but with the idea of assessing risk over all phases of production, actuaries can use the skills that they've acquired in any line of business.

Second, the CAS mentions the exploitation of risk. Usually the thought of risk is accompanied by panic and worry; it has a bad connotation in the business world. But here, actuaries can take advantage of some of the risks they find and use them as opportunities to grow. For example, with the creation and use of highly sophisticated models to assess their assets and liabilities, a company can then strategically distribute their assets to the areas with the highest probability of performing strongly.

In addition to stretching across all lines of business, ERM also assesses "risks from all sources" within that business. Again, this concept looks at risk in a holistic approach as opposed to that which has commonly been referred to as the "silo approach". It is intended to
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examine the risk from each part of an organization and manage risks together instead of each
department managing risks on their own. This can be helpful when a risk in one sector is a
"natural hedge" to a risk in another. Rather than each sector managing the risks individually,
the ERM approach would have neither risk separately hedged allowing them to hedge each
other, minimizing risk and eliminating the costs of purchasing separate hedges. An example of
this could be a corporation that has one division long in a certain asset and another division
short in the exact same asset. Individually the divisions would want to hedge these risks in
order to minimize losses, however when looking at the corporation as a whole, one would find
that these two positions on this certain asset hedge each other thus making separate hedges
useless and cost inefficient.

Lastly, this definition identifies the purpose of ERM, to benefit all of the organization’s
stakeholders, meaning anyone who has stake in the enterprise, including: shareholders,
owners, managers, employees, creditors, customers, and the government. It is important to
realize that a company’s failure impacts many more parties than the owners and employees,
thus increasing the importance of implementing a successful ERM system.
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III. WHY ERM?

Risk has been around forever in the business world and business leaders have had to find ways of minimizing this risk while still maximizing their production. Many owners have been extremely successful; however, there are also just as many who do not successfully account for these risks, and even for those who do, as society evolves new types of risks develop and become much tougher to predict. When more risks threaten a company's solvency, more companies will become insolvent as a result of these risks. Some of these new risks include foreign exchange, globalization, insufficient understanding of business, technology, increasing financial sophistication and even the risk of a terrorist attack. As risks grow in number and in complexity, actuaries have begun to realize the importance of strategically and thoroughly accounting for them. Actuaries have also realized the potential their unique skill set has to accomplish this task allowing them to branch away from the insurance industry, broadening the scope of the actuarial field. This is an exciting opportunity for actuaries indeed. (Another important reason for the creation of Enterprise Risk Management is related to the ability of actuaries to quantify risks which will be discussed later in this paper with the steps of ERM).

Other reasons businesses are realizing the importance of an ERM system are the pressures they are receiving from the stakeholders mentioned earlier, especially after the highly-scrutinized and highly-publicized failure of some major corporations over recent years. Enron, Conseco, Bear Stearns, AIG and Lehman Brothers are only a few examples of companies who have suffered such misfortune. Rating agencies, regulators, stock exchanges, investors, and other stakeholders have been requesting corporations to implement such a system in order to maintain the solvency of the corporation. With a good ERM system in place, these groups will feel safer.
IV. TYPES OF RISK

Next I will expand on the new evolved risks that are motivating Enterprise Risk Management research and driving the need for the implementation of an ERM program into businesses around the world.

Hazard Risk

Again, there are many types of risk that a company faces. What we refer to as hazard risks have always been transferred by businesses to insurance companies. Insurance companies hire actuaries to predict the probability of those risks occurring and then charge the business premiums so the insurance company can pay the potentially large costs associated with these hazards. Examples of these risks include: fire and other property damage; windstorm and other natural perils; theft and other crime; personal injury; business interruption; disease and disability; and liability claims. For many businesses, some of these perils may never occur; but because their occurrence could cause an excessive financial hit, the safest option is to pay small premiums (relatively) in order to transfer the risk to the insurer.

This concept of transferring risk can now be applied to other types of risk. It is important for businesses to realize other risks they are facing and decide how to treat them.

Financial Risk

Financial risk has always been accounted for, but never quantified and analyzed to the extent actuaries now want to analyze it. A business can be directly influenced by financial risk. The threat of a change in price of the materials they need to run the business or make their product can pose a significant risk to an organization. When they have to pay more for materials, they must charge more for their product or produce less of it.
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Foreign exchange risk can directly or “tangentially” affect businesses. If exchange rates change, prices of goods and services will increase or decrease accordingly and because the company doesn’t have the ability to control foreign exchange rates, this poses a risk. Companies can be directly exposed to this risk if it sells its product to or receives its materials from foreign countries. The company can be “tangentially” exposed if its competitors include foreign companies because the prices these competitors can offer to domestic consumers are influenced by exchange rates. If a firm’s foreign competitors can offer lower prices to its clients they may be forced to lower their prices as well. However, if exchange rates drive foreign prices up, a firm may be able to exploit this risk by stealing customers with their more attractive prices.

Other examples of financial risks include: price (asset value, interest rate, foreign exchange, and commodity); liquidity (cash flow, call risk, opportunity cost); credit; inflation; purchasing power; and hedging risk. A successful ERM system will conduct a thorough analysis of each of these financial risks to determine which will affect the business and the severity of the risk’s impact.

Operational Risk

Many operational risks haven’t been quantified and treated in the past. These risks are those that arise from the machines, people and processes through which a company conducts its business. An alteration or complete breakdown of the routine a company uses to create its product can potentially cause major financial losses. An example would be the probability of a labor union strike and how the work stoppage would affect the corporation’s finances. If a strike were to occur, the organization would benefit from having a plan in place to continue production as well as assets in reserve to finance the extra costs incurred by this risk. Another example of operational risk is key person risk. Many companies are successful because an
entrepreneur with a keen sense of business developed an outstanding plan to create a flourishing organization. He/she knows everything there is to know about the company allowing he/she to make very difficult decisions that keep the business booming. This is a key person in the business and if he/she should retire or pass away, the business would suffer a huge drop off if this risk was not treated. The successor may not have near the business savvy of the former owner and could drive the company into the ground. Again, a precise plan must be put in place so that the business can continue operation without losing value. Key person life insurance can provide a death benefit if the mortality was completely unexpected. If mortality or retirement is expected, paying for thorough training of a successor or group of successors is essential to the continuity of business operation.

Factory machines can also be subject to the risk of malfunctioning and could cause setbacks in production. A company using machinery in its production process would be well advised to analyze the risk that their machines pose. A good suggestion is to determine the chance of these parts malfunctioning and how much of a problem it would be to fix. The problems that could cause the biggest financial setbacks should be prepared for. A technician on-call or on-site should be ready with these extra parts and know how to get the machine back running as soon possible.

Many different operational risks can have an effect on a business. The Human Resource department has the risk of hiring an employee with a poor work ethic who ends up getting fired after a few months. The time and money spent on training and paying this employee then goes down the drain. A company has the risk of having an IT department incapable of fixing or preventing a big computer problem such as a virus. A large virus entering into the mainframe of a computer network can corrupt information vital to the operation of the business causing the company to lose this information and to spend a lot of money to recover, if possible. Risks like
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these can be hard to quantify but there are methods of finding the probability and financial impact of them. No risk should catch a successful organization by complete surprise.

Examples of operational risk include: business operations (human resources, product development, efficiency, product/service failure); empowerment (leadership, change of ownership); information technology (relevance, availability); information/business reporting (budget planning, accounting information, pension fund, investment evaluation, and taxation)

Strategic Risk

The last type of risk is Strategic Risk. It has a lot to do with the market for a business’s product or service and all of the factors that go into strategic planning. Strategic planning looks at the demand for products and the demand for product substitutes. It will look at competition prices, political issues and government regulations as well as the strides the world is making in technology and how well the corporation is taking advantage of technological advancements. Technological advancement makes businesses move faster, easier and more conveniently, some can cause their employees or even their product to become obsolete.

More examples of strategic risk include: reputational damage (trademark/brand erosion, fraud, and unfavorable publicity); competition; customer wants; demographic and social/cultural trends; technological innovation; capital availability; regulatory and political trends.

An athlete who is endorsing a company could commit a crime or simply show signs of poor moral behavior. If the company continues to allow this person to endorse their products, business can be lost because some customers will not support the decision to accept this type of behavior. Before affiliating with anyone or anything, an owner must be sure the ethical beliefs and moral values of those involved are in agreement. The company should also account for this risk before it happens by identifying the severity of any actions their endorser could
commit, have a decision ready as to what repercussions they will take in accordance with their own moral standing, and be prepared to issue those decisions immediately after the risk occurs.

It is not always clear exactly how to categorize a new type of risk. Some may even fit into multiple categories. The big idea here is that every risk posed to any division is a risk posed to the enterprise as a whole and therefore must be accounted for. The steps that need to be taken to handle each risk are outlined in the next section.
V. THE STEPS OF THE ERM PROCESS

The Enterprise Risk Management process has been characterized by seven steps according to the CAS. These steps range from the decision making process on the types of risks a company has, to monitoring and reviewing the ERM process it has put in place. There are few companies who have fully implemented an entire system to cover every single risk it faces, but many have begun the process outlined below:
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Establish Context

This step deals with classifying risks in a broader spectrum than the types of risks mentioned above. Risks can be looked at in three contexts: External, Internal and Risk Management. External Context considers the corporation’s relationship with its environment. A common way to do this is by running a “SWOT” analysis; this means to determine the strengths, weaknesses, opportunities, and threats of the corporation. External Context also involves the identification of the stakeholders to the company as defined above.

The next context is Internal which includes understanding the objectives of the Enterprise and recognizing the strategies and key performance indicators (KPI’s). KPI’s are data that give measurements of the performance of a corporation. These indicators help tell the business owners how successful the company is operating. The last context is Risk Management, and this deals with identifying the risk categories from the list above which are important or relevant to a particular organization.

Identify Risks

Second, the ERM system must identify risks within the categories of relevance that do one of two things: either threaten the enterprises’ achievement of its goals, or represent opportunities the enterprise can exploit and gain benefit. I have already discussed the various types of risks which can arise in all sectors of the business in many different forms; this step involves finding those that are specific to the company so that the system can move on to the next step: analyzing and quantifying the risks.

Analyze/Quantify Risks

Some risks are easy to assign a value. Hazard risks, for example, are insured because the corporation can assess how much money they will need to survive a risk given the chance that
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it happens. Many risks, especially the new ones which ERM evaluates, are very hard to quantify. Finding the probability of a terrorist attack on a company and the operational impact the attack will have can be extremely difficult. This step of the Enterprise Risk Management process takes into account all of these risks, calibrates them, and tries to assign them a feasible probability distribution function (pdf) wherever possible through scenario, simulation or other types of analysis.

A type of analysis could be creating a “best-, worst-, and expected-case scenario” evaluation to deliver to a CEO or CFO on risks such as employee salary increase after a new labor contract is negotiated. What is the lowest salary that could be agreed upon, the highest salary, and the best salary level from the business’s point of view? Combine with the likelihood of each case occurring, this information is vital to move to the next step in the ERM process.

INTEGRATE RISKS

After pdf’s have been assigned to the various risks, the next step is to combine all of them together in aggregate analysis of the entire enterprise. This is the key aspect of ERM because instead of treating all risks in the individual sectors of business, the enterprise will treat them holistically to reflect on correlations and the effects they may have on the value of the enterprise. In many cases, it is not entirely necessary to be extremely precise when analyzing the risks; even a directionally correct evaluation can be helpful. This step is where companies can find natural hedges that would have otherwise gone unnoticed in the “siloh approach. The results of this process are expressed in terms of their effect on the key performance indicators.

ASSESS/PRIORITIZE RISKS
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Next, the CAS calls for the prioritization of the risks according to their effects on the aggregate risk evaluation. A good example of this is creating a “Risk Map”:

<table>
<thead>
<tr>
<th></th>
<th>HIGH SEVERITY</th>
<th>LOW SEVERITY</th>
</tr>
</thead>
<tbody>
<tr>
<td>HIGH FREQUENCY</td>
<td>?</td>
<td>?</td>
</tr>
<tr>
<td>LOW FREQUENCY</td>
<td>?</td>
<td>?</td>
</tr>
</tbody>
</table>

A diagram like this can be very useful. Risks that occur often and have a large financial impact will go in the High Frequency/High Severity box; risks that occur very infrequently and have a small financial impact on the enterprise will go in the Low Frequency/Low Severity box and so on. These maps can be modified and adjusted to include other categories but they can be very helpful when determining the importance of one risk vs. the other.

TREAT/EXPLOIT RISKS

This is where the process can actually help decide how to make changes to increase a company’s value and minimize risk. With any risk, an enterprise must decide whether to avoid, retain, reduce, transfer or exploit it. The prioritization of the risks is essential to this process. For example, a risk in the Low Frequency/Low Severity category will most likely be retained because it occurs rarely and has a minimal impact when it does occur. A risk in the Low Frequency/High Severity category should be transferred because the cost to transfer wouldn’t be extreme relative to the risk and because the risk could put the company out of business if retained.
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A more specific example is a company discovering a lower number of employee injuries over recent years so they decide to reduce the cost of workers' compensation insurance by taking on a higher deductible. Although this would cause the severity to increase, the decrease in frequency lowers the current cost of insurance. Another example is a company predicting a higher tariff on foreign imports of a supply they use often. In order to exploit the risk, they lock into a fixed price agreement with domestic suppliers. When domestic suppliers become aware of the tariff they will want to take advantage of the tariff by raising their own prices, but since this company has locked into a fixed price agreement, they won't suffer from the increase in cost.

In general, Hazard Risks will usually be transferred to an insurance company; capital markets have come up with many ways to help corporations with their finance risks such as commodity, interest rate, and foreign exchange risks. Strategies to treat operational or strategic risks are still in development as ERM is still a relatively new process in the business world.

MONITOR AND REVIEW

The last step in the Enterprise Risk Management process is where the corporation will evaluate its decisions and repeat the process. It is very important for a company who wants their system to be productive for a long time. Old risks evolve and new risks arise constantly throughout time. A successful ERM system will keep repeating the process, identifying the new risks and running them through these steps I have defined. Revamping pdf’s as more information and research is discovered is another important aspect of this step. As the ERM process evolves, the assessment of risks can become much more precise and all the more useful with a corporation who is constantly reviewing and revising its ERM system.
VI. ERM TODAY

After laying down a foundation of what exactly Enterprise Risk Management is and how it works, it would be beneficial to take a look at what is being done professionally to further the progress of ERM, as it is still in its early stages of development.

Enterprise Risk Management Symposium

Since 2003, the CAS (Casualty Actuarial Society), SOA (Society of Actuaries), CIA (Canadian Institute of Actuaries), and PRMIA (Professional Risk Managers’ International Association) in collaboration with a few other organizations have put on an annual event known as the Enterprise Risk Management Symposium. Their objective according to the symposium website is:

“By bringing together ERM knowledge from a variety of industries, the ERM Symposium aims to build strong cross-disciplinary framework for senior management to create systematic value and competitive advantage through effective managing of risk and capital.”

The symposium is a four-day event taking place in March or April and has been located in Chicago, IL every year but its inaugural meeting which was held in Washington D.C. Recommended attendees include the CRO’s (Chief Risk Officers, a position created just this past decade who have an enormous role in the ERM system of a company), CFO’s, chief actuaries, risk professionals, equity analysts and other investment professionals, risk modeling experts, asset liability management practitioners and anyone else interested in knowing more about ERM.

These four days are packed with presentations and exhibits as risk experts from all over the world fly in to share new information and research on Enterprise Risk Management across
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many different lines of business. Sessions last all day and afterward, the attendees can network and discuss the day's topics.

Another resource the ERM Symposium committee has made available on their website is the information contained in the seminars that will be given each day of the symposium. Presenter names and titles along with electronic copies of the slideshow presentations to be delivered in the presentation can all be found on this page. In addition, archive sites from each of the past seven ERM Symposia can be located from the internet. The archives have information on who attended the seminars, who spoke at the seminars along with the handouts and recordings of some of the speeches, as well as the papers that were submitted that year.

The fact that these organizations have come together to put on this symposium eight years in a row speaks volumes for the success and importance of this subject. The number of attendees has grown steadily each year and as more business leaders learn of this risk strategy, they can exchange more research and techniques with other leaders in their respective fields.

Chartered Enterprise Risk Analyst

As evidence to the notion that ERM is an important concept that will be studied, supported and strengthened by both the CAS and SOA, an Actuarial Review article announced in May of 2009 that the CAS will pursue a global designation for those who gain expert knowledge in ERM, an idea that has been debated since 2005. Similar to the current actuarial designations, Fellow of the Society of Actuaries (FSA) and Associate of the Society of Actuaries (ASA), the CAS and SOA along with other actuarial associations officially created the designation of a Chartered Enterprise Risk Analyst (CERA).
According to ceranalyst.org, "A CERA provides the strongest ERM approach that enables smart, more confident business decisions." The objectives taken on by the members of the CAS and SOA who developed this credential were to:

- "Encompass the most comprehensive and rigorous demonstration of enterprise risk management expertise available.
- Include the theoretical, practical, and professional underpinnings of ERM
- Include the understanding of and training in actuarial approaches to risk
- Take approximately three to four years to complete"

To become a CERA, one must complete five exams (Probability, Financial Mathematics, Actuarial Models, Construction of Actuarial Models, and Advanced Finance/Enterprise Risk Management); the Validation by Educational Experience in Economics; the Operational Risk Module; and take the Associateship Professionalism Course. As of November 18, 2009, approximately 511 people have been credited with the CERA designation; they work mainly in insurance, healthcare and financial services.

Research is done around the clock all over the globe to strengthen ERM techniques and to help define and quantify all types of risk. While the SOA and CAS have taken a major leadership role in the development of this concept, many other organizations continue to make progress in this exciting new field. By working together, companies can help sustain solvency and avoid the financial turmoil that has affected many once-thriving businesses all across the globe.

**VII. HOW ERM COULD HAVE HELPED**

Since December of 2007 the United States economy has been in a significant recession causing many companies to go bankrupt, employees to lose their jobs, families to lose their
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homes and of course the stock market to plunge wiping out savings and retirement plans across the globe. A number of formerly-stable corporations, financially solid for a long period of time suffered tremendous turmoil having to lay off thousands of employees and accept government bailout plans just to stay in business (even this help wasn’t enough in many cases). Bear Stearns, Merrill Lynch, GM, Lehman Brothers and AIG, just to name a few, have either had to take bailouts, sell their company, or declare bankruptcy. This section will explain the downfall of one of these enterprises and how a topnotch ERM program could have saved them.

Bear Stearns

Bear Stearns Incorporated was a global investment banking and brokerage enterprise established in 1923. In a 2007 BusinessWeek report the company was ranked 74th in the 75 top-performing companies around the world after posting record profits for the fifth year in a row. Headquartered in New York City, Bear Stearns survived over eighty years of bear markets, recessions and depressions. They were known for trading bonds, derivatives and other securities, as well as being one of the largest underwriters of mortgage bonds. In February of 2007, the company was worth $17.9 billion and its share-value had grown 270% in just six years.

So what exactly happened to the Bear Stearns enterprise? Before the stock market collapse in 2008, housing prices were climbing rapidly to unimaginable levels. Because banks could not finance these homes with normal contracts, they offered special subprime loans with lower initial interest rates to buyers with subpar credit scores. Banks would collect closing costs and immediately sell the loans to Wall Street who would then package mortgage backed securities and issue them to the public. As an investment banker, Bear Stearns would purchase these mortgage backed securities and sell them to the public at a slightly higher price. While house prices continued rising, lenders were in the clear as borrowers could either refinance or
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sell their home at a higher price to another buyer if they couldn’t afford the loan payments. However, if housing prices were to fall, many of these borrowers would stop paying on their loans and declare bankruptcy leading to the collapse of the mortgage back securities. This would leave companies like Bear Stearns on the hook for these securities they purchased without investors to transfer the risk to. This is exactly what happened in 2007 and with a majority of the company’s funding linked to mortgage based investments, it collapsed in March of 2008. Investors did not trust the company’s ability to pay back its loans or to stand behind the complex investments it was offering to the public.

With a successful ERM program in place, Bear Stearns should have been able to identify the collapse of these securities as a catastrophic risk to their financial stability. Knowing this, they would recognize the risks that would cause this collapse and determine if it were possible. By realizing housing prices would affect the chance of a borrower to default on their mortgage and thus wipe out many of the mortgage-backed securities Bear had invested in, the ERM team would have accounted for the risk. With a company’s solvency so highly-leveraged on one type of investment, a collapse seems inevitable from an ERM point of view. Finding some way to ensure a floor on the losses sustained from defaulted mortgage loans should have been paramount in Bear Stearns’s financial planning and could have prevented the failure of the corporation. Instead, Bear Stearns was bailed out by the U.S. government for $30 billion and then sold to JPMorgan Chase for $2 per share, seven percent of its stock value before the collapse.
VIII. ERM CASE STUDY: COUNTRY LIFE INSURANCE COMPANY

Country Life Insurance is a privately held company located in Bloomington, IL. After realizing the value a successful Enterprise Risk Management system can have in their corporation, they put together a team including their actuaries, the CFO, senior and corporate managers and the disaster recovery team. They analyzed every risk the corporation faced and identified worst case scenarios for each event.

Their results showed that the largest decline in enterprise value would be caused by a “pandemic event”. Additional events that could affect the company severely include “an attack on the computer network and issues with non-guaranteed insurance elements”, according to an SOA case study on the company. The analysis gave the ERM team a quantitative perspective on the corporations risk and allowed them to understand how severe risks would directly affect the financial value of the enterprise. Since the study, the company has developed new strategies and implemented exercises so that they and their employees are prepared for the likelihood of one these events actually coming to fruition. The program has also strengthened the owners’ knowledge of risk so that they can make decisions while keeping in mind every implication those decisions could have.
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IX. CONCLUSION

The purpose of this paper was to introduce an actuarial topic that has been steadily growing in popularity over the past decade. Included above is the official definition of Enterprise Risk Management, the types of risk that companies are now facing and should be aware of and the steps in a successful ERM system. Next this paper discussed the organizations that have been developing this topic and gave a brief description of the annual ERM Symposium. Finally this paper looked at the rise and fall of Bear Stearns Inc. and how the implementation of an ERM system, like the one beginning at Country Life Insurance, may have been able to save the company.

After thoroughly researching this topic, I have found that by looking at all risks and treating them from an enterprise-wide perspective, a corporation will have a much better chance of surviving economic recessions like the one that began in 2007. As more companies realize the importance of an ERM system, actuaries will be able to utilize their advanced analytical and statistical skills in areas currently foreign to most of them. With ERM, positions outside of the insurance, pension, and life and health fields will be created, giving the future actuary more opportunities than ever before. These are exciting times in the world of actuarial science.
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