Automated Life Underwriting: Phase 2

Phase 2 Study of Automated Life Insurance Underwriting

Sponsored by
Marketing and Distribution Section
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Prepared by
Mike Batty, FSA, CERA
David Moore, FSA, MAAA
Mike McCarty
Deloitte Consulting LLP
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Contents

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Executive Summary

Many life insurance companies are turning to technology to speed and remove cost from the underwriting process. Automated underwriting systems have been developed to reduce the manpower, time, and/or data necessary to underwrite a life insurance application while maintaining the quality of underwriting decisions.

In the fall of 2009, the Society of Actuaries' (SOA) Marketing and Distribution Section Council, the Product Development Section Council, and the Committee on Life Insurance Research engaged Deloitte Consulting LLP (Deloitte) to conduct a survey investigating the role of automated underwriting in the industry. The study revealed that life insurers have a strong desire to improve the efficiency of underwriting, and while the penetration of automated underwriting is still relatively low, there is significant interest in its potential. The study also found life insurers who are using automated underwriting generally believe the systems are beneficial to their organizations. Despite some concerns with the technical and other implementation and maintenance challenges, life insurers surveyed believe they are improving the efficiency of underwriting. In fact, even insurers who are less satisfied with their own system would choose to pursue a different automated underwriting solution rather than forgo the idea altogether. The full results of the study are documented in the SOA report, "Automated Life Underwriting."

In the Spring 2010, the SOA engaged Deloitte to conduct a follow-up study. While the initial study utilized a web-based survey to capture a broad view of automated life insurance underwriting, the interview format of the Phase 2 research allowed a deeper look at the role of automation within a select number of companies. This report presents the interview findings through illustrative descriptions of life insurers' experiences with automated underwriting. Specifically, this report discusses:

- How and why companies are using automation to make underwriting decisions
- Its impact upon operational efficiency, sales, and retention
- The quality of risk selection produced by automated systems
- Cultural acceptance of increased automation in underwriting
- Challenges insurers must overcome to implement and maintain automated underwriting

While this report details many examples of life insurers' experiences with automated underwriting, the study also motivates several broad observations about which companies are more or less successful with automated underwriting. First, automated underwriting has become a genuine success for some life insurers. These companies were among those using automated underwriting for simplified issue and non-medical underwriting, and to a slightly lesser degree, for flagging pieces of information in the underwriting process for review by an underwriter. In particular, several multiline insurers have found the advantages of automated underwriting very compelling for selling small- to medium-sized policies

through agents who do not specialize in life insurance. In contrast, life insurers in the study experiencing less success are among those attempting to replicate medical underwriting with an automated system. These firms are more likely to find that an overwhelming amount of work is necessary to implement and maintain automated underwriting, only to be disappointed when human underwriters are still called upon to review many applications.

Regardless of how insurers are using automated underwriting, those interviewed expressed a high degree of confidence in their ability to select risks and maintain acceptable claims experience. Through audits of sample cases, firms believe that automated underwriting is as or more consistent than human underwriters in interpreting the information contained within the underwriting requirements for which they are designed.

These experiences are not entirely uniform. Both complaints and statements of support were made for automated underwriting by companies using it in each context. However, as an overall trend, using systems to automate portions of the underwriting process to which it is best suited, such as simplified issue, non-medical underwriting, or monitoring acceptable ranges for individual requirements, is a key to success. Underwriters often have concerns about increased automation, but they are generally accepting when they come to understand these targeted uses of automated underwriting allow them to focus their energy on more complex cases where human judgment is most valuable. Representatives from marketing departments typically support automated underwriting, and the response of agents is mixed.

Project Overview

Rigorous underwriting protects life insurers from taking undue risks, but it also adds considerable expense to the bottom line, and is often cited as a barrier for underserved populations to become adequately insured. The industry continues to search for methods to underwrite individual applicants in ways which are less invasive and more cost and time effective, yet still maintain sufficient rigor. Many life insurance companies see technology as a solution. In order to speed and remove cost from the underwriting process, they are turning to automated underwriting systems which interpret data traditionally reviewed by underwriters.

In the fall of 2009, the SOA' Marketing and Distribution Section Council, the Product Development Section Council, and the Committee on Life Insurance Research engaged Deloitte to conduct a survey investigating how automated underwriting is being used in the industry. The web-based survey captured a broad view of how many companies are using or are interested in automated underwriting, why they are using it, and their level of satisfaction. The findings are presented in a SOA report entitled "Automated Life Underwriting" released in early 2010. Throughout this report, this research will be referred to as "Phase 1."

To develop a more detailed understanding of how life insurers are using automated underwriting the SOA asked Deloitte to conduct interviews with a subset of companies from Phase 1 that are using these

systems.[1] Phase 1 took a snapshot of many companies and produced a standard and easily comparable data set, but many details of an individual company's experience can be lost through this format of communication. Although it lacks the uniformity and ability to automatically produce data for analysis, an interview approach was selected for this follow-up study (Phase 2) as the best method to fully understand how each company is using automated underwriting. A summary of the varying study approaches is provided in Table 1.

Table 1: Summary of Possible Study Designs

	Mortality Study	Survey	Live Interview
Pros	• Delivers concrete, quantifiable result about the ability of automated underwriting to select risks.	• Many companies can participate at low cost. • Standard question format. • Large dataset for analysis.	• Clear understanding of each company's situation and experience. • Companies can raise issues not anticipated in research design.
Cons	• Companies have limited mortality experience and data to share. • Different approaches to automated underwriting make inter-company data difficult to compare.	• Unique experiences of individual companies are hard to communicate.	• Time requirements limit study participation. • Unique character of each interview limits comparability. • Less concrete data is gathered through interviews.
Summary	• Although intriguing, a mortality study is not feasible at this time.	• Another survey would have limited ability to uncover additional information after Phase 1.	• Interviews provide the best method of developing a deeper understanding of each company's experience.

The ultimate goal of the Phase 2 research was to develop illustrative examples of how and why life insurers are experiencing more or less success with automated underwriting. Specifically, the interviews focused on the following topics:

- Purpose of automated underwriting, i.e., how it fits into each insurer's business goals

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[1] The initial goal of the follow-up study was to gather data from companies using automated underwriting and conduct a mortality study. However, Phase 1 revealed that too few companies have the requisite mortality experience and data for policies underwritten automatically to share for a robust study. In addition, the different ways in which life insurers are applying automation in the underwriting process makes comparing mortality experience difficult. In lieu of a mortality study, the project oversight group decided that the best way to further study automated underwriting at this time would be to conduct interviews with a subset of companies from Phase 1 that is using these systems.

- Any operational efficiencies it produces
- Its impact upon insurance sales
- Quality of risk selection and claims experience from automated underwriting
- Any unexpected challenges and benefits
- Cultural acceptance of automated underwriting

Because life insurers utilize technology for underwriting in different ways, it is important to first clarify which type of system is analyzed here. For the purposes of this study, automated underwriting system is defined as follows:

> ***Automated Underwriting System:*** *a technology solution which is designed to perform all or some of the screening functions traditionally completed by underwriters, and thus seeks to reduce the manpower, time, and/or data necessary to underwrite a life insurance application.*

Rather than focusing on any particular approach to automated underwriting, interviews covered all technologies and methodologies which meet this basic definition. Although they also aim to improve underwriting efficiency, systems whose main functions are to replace paper forms with electronic data and otherwise manage the workflow but do not interpret any of the information upon which underwriting decisions are made, are not covered in this report.

Study Method

Data was gathered for this study through phone interviews with representatives from companies using automated underwriting. The representatives from each company were selected on the basis of their knowledge of the company's automated underwriting process. These individuals were primarily underwriters, but actuaries, claims managers, and other personnel also participated in some interviews. The participating companies were selected from the respondents of the original web-based survey referenced above. The 24 survey participants using automated underwriting were invited to interview sessions to discuss their experience with automated underwriting. Fourteen companies accepted the invitation and participated in this study. These organizations agreed to participate on the condition of anonymity.

A discussion outline was used to structure the interviews. This document was distributed to the survey participants in advance and walked though during each interview. It helped provoke discussion about the topics of interest, but was not an explicit script for the session. Moreover, the discussions were tailored to best fit the unique experience of each company. For example, participants were first asked to describe any savings or additional costs resulting from automated underwriting. If the response about cost savings warranted further discussion, the interview would continue to explore how the cost savings were generated, their magnitude, how they compared to expectations, etc. Participants were also given the opportunity to raise any issues associated with automated underwriting they felt are important, but were not covered in the discussion outline. The outline was designed for an hour long conversation and was divided into the sections bulleted above in the Project Overview section of this report. A copy of the

discussion outline is presented in Appendix B. Information gathered through these interviews and subsequent clarifying discussions are the basis for the following results and analysis.

Results and Analysis

Because interviews following an outline rather than a script were used to gather information in Phase 2, the study did not result in a uniform dataset as was produced in Phase 1. Instead, the goal of the interviews was to communicate elements of each company's experience with automated underwriting, which could not be understood as clearly through the survey responses. As a result, this report primarily presents examples of issues participating life insurers have encountered, and makes observations about general trends, but does not significantly use statistical data analysis. Also, because Phase 2 focused more deeply on a small participant population; this report does not attempt to be representative of the life insurance industry overall. The results and analysis presented here are organized based on the aforementioned discussion outline.

I. Applications of Automated Underwriting – Different ways life insurers are using automation to improve their underwriting processes

It was clear from Phase 1 that different companies are using automated underwriting for different reasons. The data showed that while rules-based underwriting systems are predominant, there are wide ranges for how much of each company's business is handled by the automated underwriting system, how often the system is able to make or recommend underwriting decisions, whether or not age and amount restrictions are placed upon policies using the automated process, and what capabilities the systems have. For example, see the following tables and figures described in the Phase 1 report that show automated underwriting systems used by different companies taking different types of actions (Table 2), reaching decisions with varying frequency (Table 3), and allowing systems permission to issue at different underwriting classes (Figure 1).

Table 2: Systems Abilities to either Reach or Recommend an Underwriting Decision (Phase 1 – Table 4)

Does the system have the ability to?	
Both reach a final and recommend an underwriting decision	54%
Reach a final, but not recommend an underwriting decision	25%
Recommend, but not reach a final underwriting decision	13%
Neither reach a final nor recommend an underwriting decision	8%

Table 3: Actions Taken by Automated Underwriting Systems (Phase 1 – Table 7)

How often does the system?	Average	StDev	Range
Reach a final underwriting decision without underwriter review?	41%	39%	100%
Recommend an underwriting decision for an underwriter to review?	15%	22%	73%
Fail to reach or recommend an underwriting decision (due to data errors, complexity, or otherwise)?	44%	41%	100%

Figure 1: Combinations of Risk Classes Available to Automated Systems (Phase 1 – Figure 8)
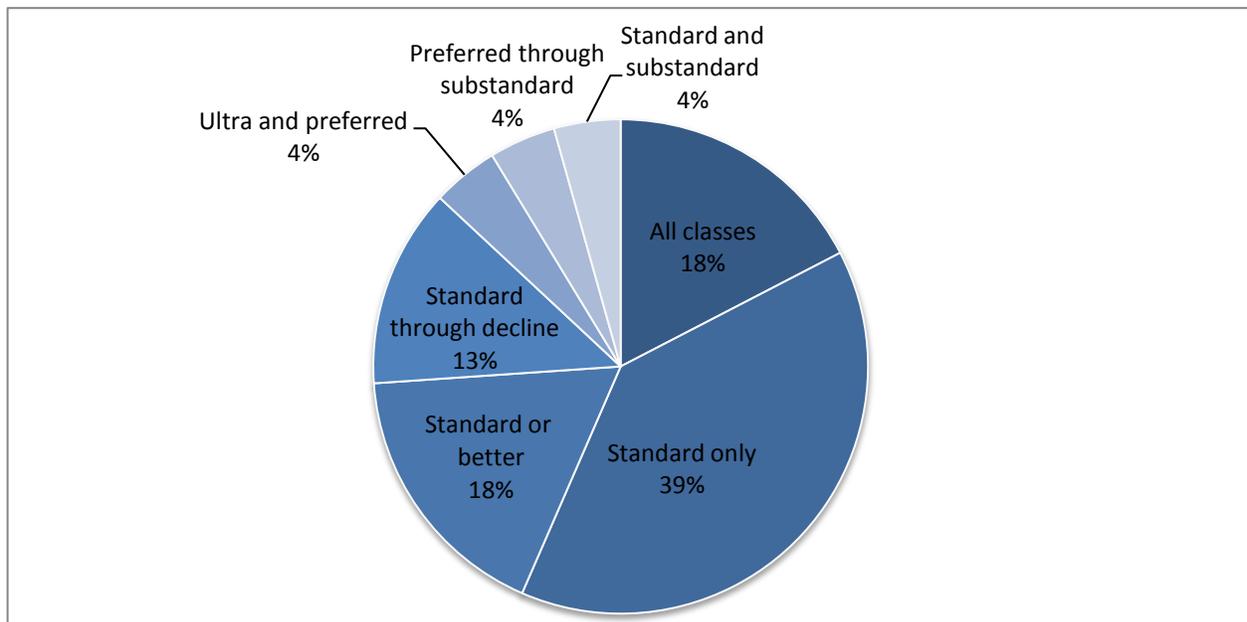
The first goal of the Phase 2 interviews was to develop a better understanding of what each company is hoping to accomplish with automated underwriting. The discussions about how life insurers are using automation revealed three general categories of underwriting systems. The three categories vary primarily in the amount of autonomy given to the system.

Alerting Underwriters to Risk Factors
The first class uses automation to flag items in the underwriting process that an underwriter must review more carefully. For example, a blood chemistry profile of an applicant will be submitted to the insurer, data will be loaded into the system, and user-defined logic will determine the cholesterol level is out of range. This information, and any other items in the underwriting process exceeding the acceptable boundaries, will be included in a report to a human underwriter. The underwriter then uses his or her judgment and knowledge of the underwriting guidelines to make an underwriting decision.

Using automation to alert underwriters of risk factors rather than attempting to make fully automated underwriting decisions has both advantages and drawbacks. The logic embedded in a life insurer's underwriting manual instructs an underwriter not only how to react to each individual risk factor, but also how to react to a combination of risk factors. Since this logic does not need to be fully developed in systems only flagging outlying pieces of information, an underwriter still must manually review files for all but the least risky applicants. However, because this logic is not required, the systems are much easier and less expensive to implement and maintain. In general, the companies participating in this research found the development and maintenance of systems such as these to be challenging, but considerably less so than the others described below.

The underwriting systems designed to flag information for underwriter review are able (either currently or with further customization) to process any underwriting requirement that is delivered in a database format. For many companies, requirements which are screened automatically include reflexive or standard application and exam questions, MIB, MVR, Rx databases, and lab results. Generally, if a particular company is not currently using the automated system to analyze each of these requirements, they expressed interest in building that functionality in the future. Since they are not adaptable to a database format, attending physician's statements (APS) and other types of medical requirements remain outside of the automated underwriting screen. However, even if they do not process the results, these types of automated underwriting tools are sometimes given the authority to order them automatically through a direct link with the appropriate vendor.

Automation for Simplified Issue and Non-Medical Underwriting
A second class of automated underwriting system is designed to complete simplified or non-medical underwriting for smaller face amounts (often up to $100,000 or $250,000). They capture a limited set of underwriting requirements that take less time and resources to acquire, interpret the information received, and make an underwriting decision for most cases in a short period of time. The set of requirements processed varies slightly, but usually includes some combination of an application (either short-form, traditional, or reflexive questions), MIB, MVR, and Rx database. Depending upon the business strategy for the product, the underwriting system can make a simple accept/reject decision on the applicant, place the applicant into a standard, smoker or in some cases a preferred category, or refer the individual for further underwriting. Because of the limited set of requirements gathered, the life insurers participating in Phase 2 using this type of system generally do not feel they have sufficient information to perform underwriting with the granularity of traditional underwriting. For example, products in this market are sometimes designed to group standard and preferred classes into a single risk class, and companies do not use this process to rate substandard risks. Some companies will refer what appear to be higher risk cases to human underwriters who will potentially order additional requirements, while others will simply decline to offer insurance through this process.

For companies in this study, the times in which decisions are rendered for simplified-issue and non-medical underwriting applications vary from a few seconds to several days. Some are designed to be true instant issue processes where an application is taken electronically and requirements are ordered and delivered automatically allowing for very rapid underwriting decisions. Other companies placing a slightly lower premium on speed, can take applications via paper or schedule a call-back interview, but

still make underwriting decisions in less time than is typical for a traditional, human-driven underwriting process.

In addition, the percentage of business submitted for which these systems are able to complete underwriting varies from company to company, but is generally quite high, with a typical decision rate being 80 percent (either rejecting or making an offer). One company in the study is able to achieve a rate as high as 95 percent. The variance depends upon both the individual company's tolerance for underwriting risk as well as the sophistication of the system coding. Some firms rely upon their system to interpret cases which are less clear cut, while others have empowered them to handle more complex issues. For example, some firms have attempted to provide rules for how nearly every possible combination of risk factors results in an underwriting decision, while others have made a smaller investment in rules development knowing that more cases will require expert human judgment. The policies for which a decision cannot be made are turned over to an underwriter who may determine additional requirements are necessary.

In the experience of the study participants, designing an underwriting system to make or recommend underwriting decisions requires significant time and resources to build and maintain. Instead of simply flagging information that is potentially pertinent, the system must determine how all available information translates into an underwriting decision. In addition to the infrastructure required to link the necessary data sources and systems, coding the necessary logic is a large undertaking. However, because the decisions are based upon a limited set of underwriting requirements, coding these systems is less cumbersome than those that underwrite larger policies.

Also, due to the markets and distribution forces often employed by multiline insurers, automated underwriting for rapid issue of smaller (often less than $100,000 or $250,000) policies has been particularly popular. The appeal of this strategy will be discussed further in subsequent sections of this report.

Automation of Paramedical and Medical Underwriting
The third and final category of automated underwriting that is employed by the Phase 2 participants is using a system to assist with paramedical and medical underwriting. Companies studied in Phase 2 using this approach essentially translate their underwriting manuals into programmed rules in an automated system. Applicants complete a full application with reflexive questions (possibly through a tele-interview) and undergo the company's standard age and amount requirements. Instead of asking a human underwriter to assess the requirements, the rules-based system interprets the information and assigns an underwriting class. Phase 2 participants employing this approach are typically using automation to process the application, MIB, MVR, Rx databases, and lab results. If an APS or further requirements are necessary, the case will kick-out of the automated system for a review by an underwriter. In some automated systems, rules are coded to determine when an APS or other tests should be ordered for cause. Age and amount limits are often used, but when in place, the limits for this underwriting are significantly higher than the limits for simplified issue products. In most cases, applicants can be underwritten into the full range of underwriting classes offered by the company through the automated process.

Because a significant number of applicants do require an APS, data errors occasionally do occur from improperly executed electronic and tele-applications, and cases are sometimes too complex to be handled by existing rules. Many companies using these systems have found they are able to directly issue a significantly smaller fraction of policies than the users of automated underwriting for smaller policies. Exceeding one-third of policies issued directly by the system proves challenging. Since many cases do need underwriter review it is very helpful if the system produces a clear and concise report for cases that are referred to underwriters. One life insurer expressed frustration that its particular system did not provide such information and underwriters were forced to hunt for the offending pieces of data. In its view, this materially reduced the potential speed with which cases can be underwritten.

In the opinions of study participants, these full-scale automated underwriting systems are also the most challenging undertakings. They encompass all the coding and systems development described for simplified issue and non-medical underwriting, but on a scale large enough to contain a full underwriting manual. These systems have a broad array of functionalities, including:

- Processing medical lab tests;
- Processing more developed reflexive applications (which provide greater detail into impairments);
- Understanding rules to the extent they can assign debits and credits;
- Potentially assigning substandard ratings; and,
- Determining situations where additional medical requirements are necessary.

Several companies interviewed expressed concerns about the feasibility of maintaining a system requiring thousands of rules to capture the complex workings of their underwriting process.

Summary

Table 4 below presents a summary of the different uses of automated underwriting covered in Phase 2.

Table 4: Summary of automated underwriting uses among study participants

	Flag out-of-range risk factors for underwriter	Complete simplified and non-medical underwriting	Complete paramedical and medical underwriting
Makes UW decision	Never	For most applicants	For the minority of applicants
Size of Policies	Any	Small to medium. Often less than $100,000 or $250,000.	All for some insurers, while others exclude large face amounts (e.g. greater than $2 million)
Pros	• Easier to implement and maintain. • Allows underwriters to focus upon important information.	• Challenging, but manageable to implement and maintain. • Completes underwriting for many applicants. • Very popular for certain markets.	• Can essentially replace underwriters for a subset of relatively large policies. • Can drive ordering of requirements for cause. • Can provide reasons why policies are referred to an underwriter.
Cons	• Underwriter review necessary for every applicant.	• Only applicable for smaller policies.	• Many applications still require underwriter review. • Very costly to implement and maintain.
Phase 2 Companies	4	8	4

Although we make no assumptions that the approaches to automated underwriting identified in this study encompass all that exist in the life insurance industry, or are necessarily representative in frequency, we feel it is helpful to document their frequency among the participants of Phase 2. Eight participating life insurers are using automated underwriting for simplified issue or non-medically underwritten products. Four are using systems to flag items in the underwriting process for the underwriter to review, and four are using it to assist with traditional fully underwritten products. As there are 14 participants in the study there is slight overlap with two insurers applying a combination of the strategies above. One company is using a system for simplified issue and another for fully underwritten products, while another company is using automation for simplified issue and a flag approach for larger cases.

When choosing to implement automated underwriting life insurers have the choice of developing a home-grown system or purchasing one from a vendor. Only two of the systems covered in this study were developed by the insurer, while all others were vendor-based systems. In most cases, however, the vendor solutions are not off-the-shelf. Instead, they require significant customization. Insurers interviewed have had varying experiences working with vendors for customization, which will be discussed later in this report.

Another trend that became apparent throughout the interviews is that the automation of underwriting involves a transformation in the way an application is taken. While some companies still allow agents to submit applications in a traditional paper process and then enter the data into the system manually, all allowed and nearly half forced information communicated by the applicant to be submitted in an electronic format. To fulfill this requirement, participating life insurers utilize an online electronic application, a tele-interview, or both. The electronic and tele-applications are represented in roughly equal proportion in the study population. Not only are they often used together, in many cases, implementation of automated underwriting is accompanied by implementation of one or both of the electronic or tele-application processes. Although technically distinct from automated underwriting, some of the most spirited conversations about cultural acceptance were about changes to the application process. Since these issues are encountered in most applications of automated underwriting they will be discussed further later in the report.

Whether or not the automated underwriting system is designed for simplified issue/small face amounts or for more traditional policies, the insurers interviewed generally did not select certain products for automated underwriting. Instead, life insurers usually apply automation to all products that are underwritten using a consistent methodology. For each market segment (simplified and fully underwritten) they decided whether or not automated underwriting would enhance the business, and then chose whether to implement it for all products in the segment. Two exceptions to this trend resulted from the application process. Two companies implemented a tele-application process for term business while still using paper for permanent products. Therefore, they only implemented automated underwriting for the business covered by the tele-application because the necessary data is transmitted in a machine-readable format.

Occasionally, individual producers are allowed to select which application process to use, and thus indirectly, whether automated underwriting is utilized. Some companies that have both career and independent agents found implementing process changes easier in the career group. In several other cases, small blocks of specialty products requiring different underwriting rules are not among the products underwritten automatically. Therefore, the participating insurers do not appear to be making strategic decisions about which products to underwrite with a rules-based system, but rather are using the approach where it is most convenient given other idiosyncratic aspects of their business.

II. Operational Efficiency – The ability of automated systems to improve the efficiency of the underwriting process

After discussing how the firm is using automated underwriting, the next topic explored was the impact on operational efficiency. The two topics of greatest interest were changes to underwriting cost and

process time. Study participants were asked to either compare business underwritten with an automated system to the same type of business before implementation of automated underwriting or to similar business still underwritten through a traditional process. These discussions revealed the success levels for improving operational efficiency varied significantly among the participants. Further, the degree of success tends to vary based in part upon which of the three applications of automated underwriting the life insurer employs.

We will first discuss the impact of automation on underwriting costs, which Phase 1 revealed was the second most important reason for using automated underwriting. Half of the participants are enthusiastic about the cost savings they are experiencing, while others have seen minimal cost reductions or feel that costs have increased slightly. Not all of those satisfied are able to explicitly quantify the savings, but several have quoted between 20 percent and 80 percent reductions in underwriting costs for the covered business. Sample statistics are shown in Figure 2.

Figure 2: Percentage Cost Savings from Automated Underwriting among Satisfied Insurers
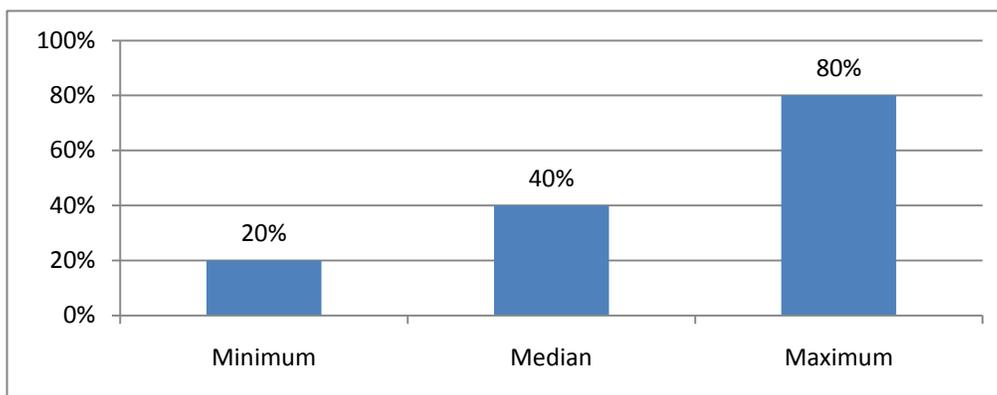
The dominant savings achieved is via a reduction in the amount of underwriter time required during the underwriting process. For systems that make or recommend underwriting decisions, underwriters are asked to spend less time on simple cases. When automation raises flags for questionable information, the underwriter saves time by not reviewing the other pieces of information. In addition, several insurers cited a reduction in the time underwriters spend either providing updates to or negotiating with producers. In concert with implementing automated underwriting, these insurers limited the number of underwriting exceptions that would be made, and thus the ability of producers to engage underwriters. For one insurer in particular, this admittedly produced a trade-off between agent satisfaction and cost savings, but with their captive distribution force they believe the strategy is advantageous.

Many insurers also utilize systems where agents can log in and check the status of a particular case. While a call to an underwriter inquiring about an application status may only last several minutes, this time easily accumulates as underwriters are covering multiple cases simultaneously. This time saved has produced meaningful savings. Finally, two insurers indentified a large reduction in applications not in good order (NIGO) because their electronic application and automated underwriting process identifies the problem immediately and prompts the agent and applicant to rectify any issue. These insurers feel

this ancillary benefit is actually the most significant of any delivered by automated underwriting. One participant that was particularly pleased with the reduction in NIGO applications found that it reduced clarifying e-mails to and from producers by 800,000 per year.

While the underwriting department salary costs are fixed in the short term, the savings from reducing the demand on underwriters per case can be realized over time through staffing adjustments. The most common approach is to allow business growth to consume the additional underwriter capacity (i.e. the number of applications an underwriter can review per day) without having to hire additional staff. Several companies are pursuing this strategy, and one shared its explicit plans to reduce its hiring model for underwriters by 5 percent. However, another company has significantly reduced current underwriting staff as a result of an unexpected leveling of the business growth trend.

Life insurers less impressed with the cost savings consistently raised similar issues. For example, three companies have not yet refined their system's ability to determine when to order an APS for underwriter review. Currently, the systems are ordering an APS with greater frequency than human underwriters had been, and in their opinions, more than necessary. In one case the increase in APS costs offset what otherwise would have been material savings from automated underwriting. For other companies, balancing a reduction in direct underwriting costs against the resources used to implement and maintain an automated underwriting system has yielded little, if any overall cost savings. Several insurers cited underwriters having to review more cases or individual requirements than they had anticipated, eating into projected cost savings. In general, these frustrations with automated underwriting were met with a sense that their system was yet to hit its stride for cost savings rather than a reassessment of the potential value of automated underwriting. In all but two cases where insurers were underwhelmed with the cost saving performance, the company described refinements, which they felt would help move them toward their goal, such as revisiting the APS rules or coding the logic more extensively so fewer applications must be manually reviewed. The general feeling among study participants is still one of optimism for the potential of automated underwriting.

The insurers pleased with the cost saving performance came predominantly from those using automated underwriting for rapid issue or to flag outlying requirements. Potentially, because the underwriter's time constitutes a larger fraction of underwriting costs on small cases than it does when more medical tests are necessary, the decrease in underwriter involvement is more significant to these companies. For larger cases, using automation in underwriting as a flag rather than a replacement for underwriters appears to offer the greatest return on investment. The strategy described by several insurers is to utilize automation for more suitable tasks, such as determining whether a given piece of data needs more attention, rather than conducting a massive coding effort which is necessary to automate a full underwriting process. Among Phase 2 participants, the additional investment for full automation in this market does not appear to be generating consistent results. These trends are also apparent in companies' level of satisfaction with the cost savings they are experiencing, which are shown below in Figure 3.

Figure 3: Percentage of Insurers Satisfied with Cost Savings by type of Automated Underwriting
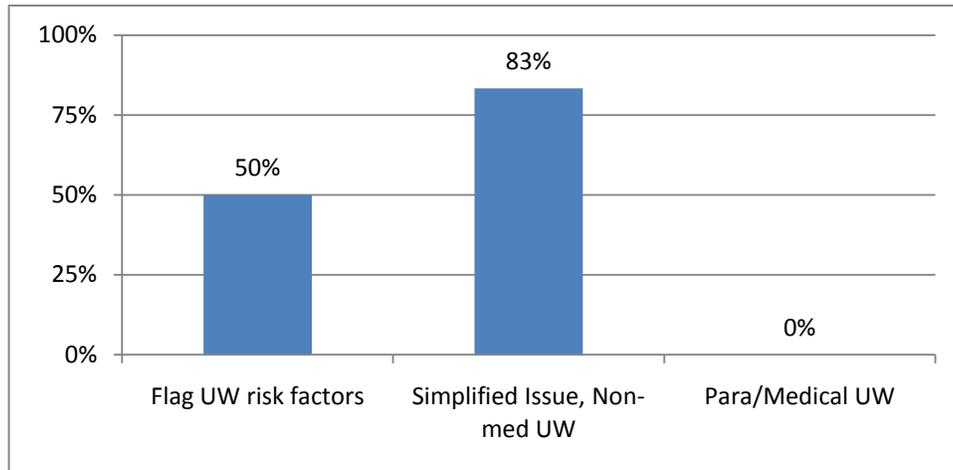
According to the respondents of Phase 1, reducing underwriting time and ultimately new business turnaround time is the most important purpose of automated underwriting. As with costs, some insurers interviewed are enthused with the time saved in the underwriting process, while others have seen little benefit. The change in underwriting time also shows a strong relationship with the type of automated underwriting application used. The majority of firms using automation for small cases are pleased with their system's abilities to shave time off the underwriting process and issue policies very quickly. One life insurer cited a five-day reduction from its traditional non-medical underwriting to the instant issue, which they noted was made possible with automated underwriting. In contrast, insurers using automated underwriting where medical requirements are ordered have found that even if an underwriter's time is saved throughout the underwriting process, the limiting factor in approving the case is still the time required to receive lab results and medical records. Thus, for insurers outside of the rapid issue market, time savings are not likely to become a significant advantage of automated underwriting.

Table 5: Summary of Changes to Operational Efficiency from Automated Underwriting

Operational Efficiency Summary	
UW Cost Savings	• Second most important goal (as reported in Phase 1). • Many insurers using simplified issue and non-medical underwriting have experienced significant decreases in underwriter time required, and thus cost savings from automated underwriting. • Reduction in NIGO applications has also been a significant advantage for insurers. • Insurers using automation to flag items for underwriter review have also produced consistent cost savings. • Insurers using automation for full underwriting are less satisfied with the cost savings. • Implementation and maintenance costs can be difficult to overcome to produce overall cost savings.
UW Time Savings	• Simplified issue and non-medical underwriting applications are able to materially reduce new business turnaround time through automated underwriting. • The time required to order and receive medical requirements are still generally the limiting factor for underwriting larger policies.

III. Sales – The impact of automated underwriting on life insurance sales

In addition to producing underwriting savings, the degree to which automated underwriting can help life insurers drive sales can also become a significant benefit. The insurers participating in Phase 2 had sharply different experiences with sales depending again primarily upon how they are using automated underwriting. The areas through which insurers feel sales are impacted by automated underwriting are underwriting time and policy price. Therefore, the insurers using automation to complete or flag information for medically underwritten products and that did not also reduce product pricing, experienced no material change in sales.

Several companies using automated underwriting as part of a rapid issue process (either within minutes or a few days) do feel the increased speed of underwriting is a strong sales incentive. In particular, multi-line companies with primarily P&C focused distribution forces found success with this application of automated underwriting. In their opinions, rapid issue products made possible by automated underwriting fit their markets and distribution channels very well. Many of the applications received by these companies have small and moderate face amounts, and are therefore candidates for rapid issue underwriting. Further, P&C agents seem to appreciate the speed and simplicity of the automated underwriting process more than agents specializing in life insurance. Again, according to multiple firms interviewed, their multi-line agents are accustomed to the speed and web-based approach of

underwriting home or auto policies and find delivering comparable speed for life insurance policies makes it much easier to sell to their existing clientele. Interviewees also reported greater difficulty in converting their seasoned life insurance agents to a technology-driven process.

In addition to reduced underwriting time driving sales, one company which lowered premiums for mortality experience (described below) saw a large increase in sales. Other companies found that automated underwriting itself is not an impediment to sales, but changes to the application process described above can be a source of agent resistance. These issues will be discussed further in the cultural acceptance section below. Of course, the impact of automated underwriting on sales is somewhat subjective given the many confounding economic factors that have altered sales trends in recent years. Several companies reported material changes in sales they did not explicitly attribute to automated underwriting.

IV. Risk Selection and Claims Experience – Policy experience generated by automated underwriting systems

As described above, the original goal of Phase 2 research was to gather data from insurers using automated underwriting to conduct a mortality study. However, through Phase 1 we realized data availability would be limited, and the experience of companies using automated underwriting for different purposes would not be comparable. Given these challenges, we instead discussed each insurer's level of comfort with the risk selection and claims experience produced by automated underwriting.

With only minor exceptions, the life insurers interviewed are satisfied with the risk selection from automated underwriting. Some have monitored claims over a period of years and been satisfied with the experience. Many insurers who have not explicitly studied mortality attributable to their automated business or have only been using automated underwriting for a short period of time, have conducted audits of cases underwritten by the automated system to ensure it is performing up to expectations. Through a partnership set up by one company, its reinsurer performs the audits for approximately 1,000 cases per year. Outside of minor kinks that have been corrected through updates to the system logic, insurers interviewed have been largely satisfied with risk selection.

While most insurers interviewed believed automated underwriting results in mortality experience similar to traditional underwriting, two companies in the study had explicit expectation that the systems would produce more consistent decision making, and thus better mortality experience. Both expressed some concern with the frequency of exceptions and errors made by the traditional underwriting process, and were expecting the rules-based system to help eliminate some of this inconsistency. One company explicitly reduced mortality assumptions by 5 percent in the pricing of products that are automatically underwritten to account for fewer underrated risks hitting the books. Though limited, this pricing reduction has been consistent with the emerging mortality experience.

Comparable mortality experience, if not slightly more reliable risk selection, is consistent with our expectations for automated underwriting. The systems discussed in this study do not markedly change the underlying underwriting methodology, but rather use coded logic to replicate human decision

making. To the extent these systems are able to do so successfully, the end result of underwriting should be virtually identical. If instead, the automated underwriting systems change the methodology with which underwriting decisions are made (i.e. they are no longer driven by the same underwriting manual), we may expect more variation in risk selection and claims experience.

Beyond mortality experience, the life insurers participating in Phase 2 also found little change in retention, appealed decisions, contested claims, and policy rescissions. One company, however, did mention that reviewing cases upon appeal can be more difficult since there is no underwriter to consult about how the original decision was reached.

In most instances, automated underwriting did not materially change the relationship between the insured, the agent, and the insurer, and thus lapse experience was also not altered. One company noticed a slight increase in year one surrenders since implementing automated underwriting for a rapid issue product. This company attributed the uptick to buyer's remorse. With policies applied for and issued in the span of minutes there is little time for an applicant to question their decision. Instead, the first opportunity to do so comes when the next premium is paid. Still, the insurer believes this increase in surrenders was more than offset by the sales benefit of rapid issue.

Table 6: Summary of Risk Selection and Claims Experience from Automated Underwriting

Risk Selection and Claims Experience Summary
• Insurers have gained confidence in the ability of automated processes to underwrite effectively by both monitoring claims experience and conducting system audits. • Most believe automated underwriting produces similar results, but two believe it reduces mortality expectations through increased consistency. • Data to conduct an industry-wide, automated underwriting study is scarce. • Insurers report little impact upon retention, rescissions, appealed decisions and contested claims.

V. Unexpected Challenges and Benefits – Experiences with automated underwriting that diverged from expectations

The Phase 2 discussions were structured to cover the most common challenges and benefits of using automated underwriting. However, researchers were also interested in any ancillary benefits that companies discovered or any issues that were more challenging than expected. The life insurers interviewed shared a number of interesting experiences.

In virtually every case, the work necessary to implement and maintain an automated underwriting process requires more resources than expected. The insurers interviewed understood they were undertaking large projects, but they still generally found them to be quite intensive compared to expectations. First, the logic coding required to replicate underwriting manuals and human judgment can be very complex, and at times immense. Several insurers described automated systems that encompassed many thousands of rules in order to deal with as many contingencies as possible. It was

clear from the interviews that the coding necessary for flagging pertinent information is the most manageable approach because the interactions among disparate pieces of information becomes irrelevant for the system. Coding logic for simplified issue and non-medical automated underwriting is a significant increase in complexity, but still falls well short of that required for full underwriting.

Developing the appropriate rules is a large step, but actually coding them and linking data sources to allow an automated system to fit smoothly into an insurer's new business process is also very challenging. Even after implementation, the system must be maintained to meet regulatory changes, adjustments to underwriting guidelines, or changes to data sources. The resources required to support automated underwriting highlighted the importance of scale. In fact, one company interviewed recently ended its otherwise successful automated underwriting process because changes in business strategy had deemphasized the simplified issue product niche, and the efficiency gains no longer justified the costs.

As discussed previously, most life insurers interviewed rely upon vendors to assist with implementation and maintenance of automated underwriting systems. Experiences with these vendors do vary from company to company. Some expressed frustration with always having to work through a vendor to make system changes. In several of these cases the interviewee complained about the responsiveness of the vendor. Two companies, however, specifically complimented the responsiveness of the vendor and described their relationship as a true partnership. Even companies that can make changes to their systems without the support of a vendor wished the process were easier for underwriters to accomplish without the need to engage IT support.

One surprising drawback of automated underwriting mentioned by three insurers is that inexperienced underwriters can lose effective training grounds. These insurers found it helpful to assign junior underwriters to either smaller cases or those with fewer risky elements apparent on the application. If automation is used to process these cases or flag only negative information, inexperienced underwriters are pushed out of these practice grounds, and training becomes a more difficult process.

One positive surprise mentioned by four insurers is the volume of data for detailed analysis automated underwriting provides. While many companies using traditional underwriting may not store underwriting data in database format, it is required by automated systems. By default, a large database is constructed, which can then be used to analyze emerging experience. Further, most vendor-based systems incorporate extensive data reporting capabilities.

Table 7: Summary of Unexpected Challenges and Benefits of Automated Underwriting

Unexpected Challenges and Benefits Summary
• Implementing and maintaining automated underwriting systems is very resource-intensive. • It is particularly challenging to automate medical underwriting. • Automating small and simple cases can make it more difficult to train junior underwriters. • Data warehouses produced through automated underwriting provide a great resource for analysis.

VI. Cultural Acceptance – Cultural issues with automating the underwriting process

Cultural acceptance was covered in Phase 1, but the data painted a somewhat unclear picture. Therefore, we revisited the issue in Phase 2. As given in Figure 4 below, Phase 1 showed fairly strong cultural support for automated underwriting across different stakeholder groups. We took the opportunity in Phase 2 to develop a deeper understanding of the issue.

Figure 4: Receptiveness of Underwriting with an Automated System (Phase 1 - Figure 14)

1 not receptive; 5 very receptive
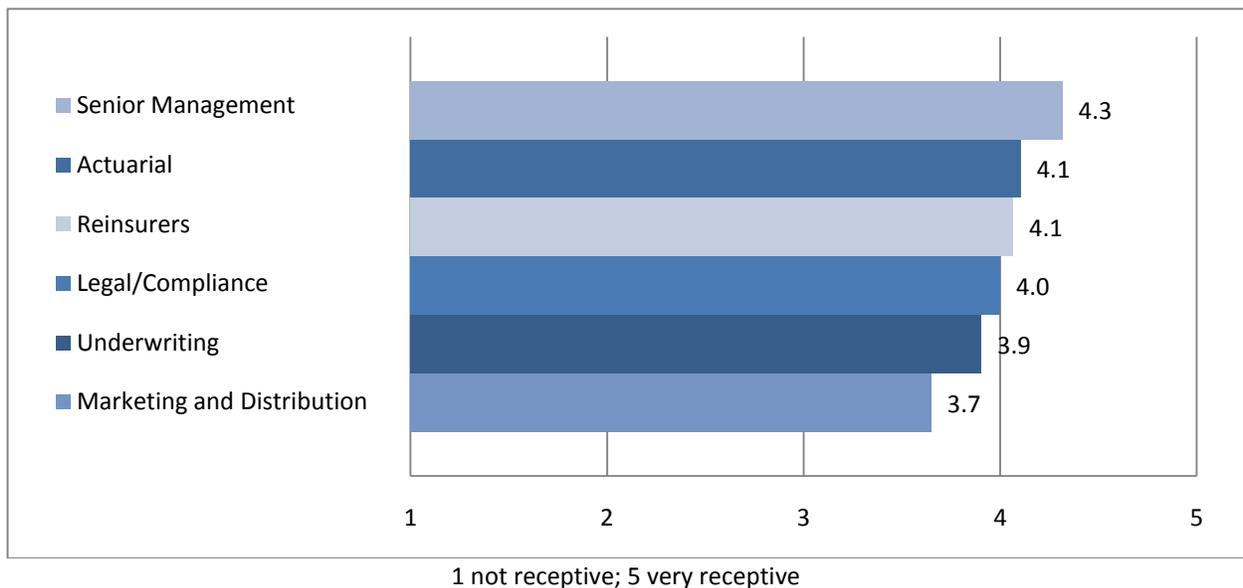
The underwriting staff is most directly affected by the use of automated underwriting. Therefore, it is not surprising that much of the discussion around cultural acceptance centered on that group. Though not uniformly so, underwriters from the companies interviewed generally have positive feelings about automated underwriting. The advantage of automated underwriting from an underwriter's perspective is the system's ability to complete routine tasks that would otherwise take time and focus away from more complex duties, therefore making better use of an underwriter's talents. According to all but a few of the companies surveyed, this is a prevailing viewpoint both among underwriting managers and staff.

Certainly, the introduction of automation has caused some underwriters to question their job security. As described above, this feeling is not without justification as automated systems have allowed companies to reduce hiring, or even the current size of their underwriting staff. However, only two companies described significant issues with their underwriters. Not surprisingly, one of these firms did reduce headcount significantly. Because it is the less culturally disruptive solution, most firms for whom automated underwriting has increased underwriter productivity plan to absorb the additional capacity by reducing future hiring plans rather than cutting current headcount.

Among the companies having more success managing the people change, underwriters did have initial questions about how automation would impact their futures. These worries have generally been quelled over time as the limitations of automated underwriting are revealed; too many cases are referred out of the system for underwriter review and the systems themselves require too much upkeep to be full replacements for underwriters. The general consensus from underwriters who have seen systems in action is there will still be significant need for a human touch on the underwriting process for the foreseeable future. In fact, one company found that differences between traditional and automated underwriting play to the strengths of different underwriters. Underwriters that are more detail oriented have self-selected to participate on the automated underwriting team, while underwriters that prefer to have more contact with agents remain on the traditional underwriting team. This arrangement has allowed both methods of underwriting to coexist with minimal cultural backlash.

As shown above, the Phase 1 stakeholders least receptive to automated underwriting were marketing and distribution. It became clear through the interviews that producers were the drivers of these rankings. For the companies where sales are driven through automated underwriting, the marketing team is an enthusiastic supporter. In contrast, the cultural responses of agents are mixed.

As mentioned previously, the actual automated underwriting is often transparent to producers. Therefore, it is a much less significant issue from their perspective than the supporting processes, such as taking an application in electronic format (online or via phone). However, because the application process and automated underwriting are so closely linked it is important to discuss producers' reactions to these processes as well. Some agents, in particular the multi-line P&C producers described above, are accustomed to a technology-driven application process and were enthusiastic to see it mimicked in their life insurance portfolio. Other companies have had experiences with life-specific agents that are much more traditional, and are skeptical of a process that takes greater control of the relationship with the applicant and underwriter.

The companies interviewed for Phase 2 have taken different approaches to managing their producers. Some have allowed them to submit applications in any way they prefer, and then either maintain staff to manually enter the data from the paper applications so they can be sent to the automated system, or simply allow the paper applications to flow through traditional underwriting. Two companies have piloted the tele/e-app process for one particular product line. Others have enforced a more wholesale change to electronic applications and automated underwriting for all producers. As expected, the insurers in Phase 2 with captive distribution forces clearly had greater success implementing process changes than those using predominantly independent agents. In general, agents that have begun to use

the new processes have become more accepting over time, but several companies are still struggling with compliance from portions of their field force. Due to this resistance, one company has decided to scale back its plans for automated underwriting, while another has pushed forward based upon the belief that sales lost from some agents will be compensated for by agents who do like the electronic application.

Table 8: Summary of Cultural Acceptance of Automated Underwriting

Cultural Acceptance Summary
• Underwriters are initially wary, but often come to accept and appreciate the value of automated underwriting once they see it in action.   • Some companies still have issues with underwriters feeling lack of job security.   • Automated underwriting and application processes are particularly popular with multi-line agents that focus primarily upon P&C business.   • Traditional life insurance agents are harder to win over with an electronic application process since it reduces their interaction with the applicant and the underwriter.   • Marketing departments are generally supportive of automated underwriting due to their potential to generate sales.

Conclusions

While the data from Phase 1 generated a wide-angle view of automated underwriting in the life insurance industry, the interviews for Phase 2 provided a much clearer picture of individual company's experiences. This insight motivates several general impressions about which companies are more or less successful with automated underwriting. First, the interviews contained some genuine success stories with life insurers that are very satisfied with automated underwriting. These companies were among those using automated underwriting for simplified issue and non-medical underwriting, and to a slightly lesser degree, for flagging certain items in the traditional underwriting process. In particular, multi-line insurers found the advantages of automated underwriting particularly compelling for their small- to medium-sized policies and agents not specializing in selling life insurance. The life insurers experiencing less success were among those attempting to replicate medical underwriting with an automated system. These firms found that an often overwhelming amount of work is necessary to implement and maintain the automated systems, and were disappointed that human underwriters still used to review many applications.

These experiences shared during the study were not entirely uniform as both statements of support and opposition were made for automated underwriting in each of the three applications. However, as an overall trend, using systems to automate portions of the underwriting process, such as simplified issue, non-medical underwriting, or monitoring acceptable ranges for individual requirements, is a key to success. Underwriters often have concerns about increased automation, but are generally accepting when they come to understand these targeted uses of automated underwriting allow them to focus their energy on more complex cases where human judgment is most valuable.

Finally, it is interesting to analyze several additional elements of the Phase 1 study in the light provided by the Phase 2 interviews. Consistent with the Phase 1 findings, the insurers interviewed expressed differing levels of satisfaction with their automated underwriting systems. For example, insurers using automation of simplified and non-medical underwriting reported overall satisfaction of 3.5 out of 5 in Phase 1, while insurers using automation as a flag scored 3, and insurers using automation for paramedical and medical underwriting scored 2. These results are also related to how much business is handled by the automated system. As gleaned from the Phase 1 data, insurers using automation for simplified and non-medical underwriting received final or recommended decisions on 80 percent of applicants, while the other classes of automated systems only were able to deliver final or recommended decisions in just over 10 percent of cases. These insights serve as further examples of how automation is more adaptable to certain types of underwriting processes and applications.

Appendix A: Acknowledgments

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Appendix B: Automated Underwriting Discussion Outline

A PDF copy of the interview discussion outline is presented here. This outline was used to guide the discussions with each study participant.

Phase II Automated
Underwriting Researc