

PRIORITIZATION OF SMALL BUSINESS ENTERPRISE OWNER CONCERNS ABOUT THE AFFORDABLE CARE ACT USING THE ANALYTIC HIERARCHY PROCESS

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ABSTRACT

For almost a century, Americans lacked a comprehensive health care system. Upon the passage of the Affordable Care Act (ACA) in 2010, politicians, media, and lobbyists provided conflicting and confusing interpretations of the law. With such varied opinions, small business enterprise (SBE) owners became concerned about the potential adverse financial effects of the ACA. In this paper, we researched the problem by applying the Analytic Hierarchy Process (AHP) to create a ranking of the concerns of the SBE owners toward the ACA. A sample of 50 SBE owners representing 5 specific industry groups in Richmond, Virginia, was used to obtain a cross-sectional view of the concerns which allowed us to ascertain their uniformity or variability across these industry groups. The AHP sample data set was obtained via a pairwise comparison questionnaire. The AHP analysis revealed that the topmost SBE owners concerns were insurance premium, quality of care, and tax burden. In addition, these concerns were non-uniformly ranked among the industry groups. However, the highest and lowest concerns in each industry group were the same across the industry groups.

Keywords: AHP; Affordable Care Act; small business enterprise owners

1. Introduction

In the 20th century, several U.S. presidents—President Theodore Roosevelt, President Harry Truman, and President William Clinton—attempted but were unsuccessful in their efforts to create a comprehensive health care system (Oberlander, 2012; Parks, 2011). However, in 2010, President Barack Obama signed the Affordable Care Act (ACA) into law (U.S. Department of Health and Human Services, n.d.). Despite several challenges, the U.S. Supreme Court upheld the law in 2012 (Curfman, Abel, & Landers, 2012).

Several studies, research articles, and books alluded to concerns about the adverse financial impact of the law on businesses (Geyman, 2012; Hellander & Bhargavan,

2012). However, the relatively new literature lacked studies that quantify the intensity of specific business owner's concerns toward the ACA. We focused in particular on small business enterprises (SBEs) since many of the concerns reviewed in the latest research articles were identifying these concerns as pertinent mostly to such small businesses. More importantly, the lack of quantification of the importance, weighting, or ranking of the SBE owner's concerns relative to each other provided the motivation for this research to measure the intensity of such concerns. Once these concerns were identified, we then developed a ranked hierarchy treating them as criteria in the application of the Analytic Hierarchy Process (AHP) technique (Ishizaka & Labib, 2011).

The first issue facing the researchers was that a standard definition of an SBE was cumbersome to obtain. Eyal-Cohen (2013) provided definitions based on securities law, health care coverage, labor and employment, patent law, and internal revenue code and described the small employer as an employer hiring up to 100 employees. For the purpose of this research, we considered an SBE as a business in the United States that employs up to 50 full-time equivalent (FTE) employees (Healthcare, n.d.).

The second issue was to identify and apply the proper multi-criteria decision-making (MCDM) technique. For this purpose, several MCDM techniques were considered such as AHP, ELECTRE, MACBETH, and PROMETHEE. The findings of theoretical and experimental validation, Ishizaka, Balkenborg, and Kaplan (2011) revealed no single MCDM method was better than another method. However, we selected AHP for its ability to compare quantitative or qualitative criteria and check the consistency of judgments (Aminbakhsh, Gunduz, & Sonmez, 2013). The AHP method involves a qualitative approach for determining the objective (Level 0), criteria (Level 1) and sub-criteria (Level 2 or below), structuring these into a hierarchy, and ranking each within the corresponding hierarchy levels. Furthermore, the AHP method requires a quantitative approach for pairwise comparison, consistency checking, and aggregation of judgments.

The identification and prioritization of SBE owner's concerns highlight key perceptions of SBE owners about the impact of the ACA on their businesses. From this research, we revealed the crucial concerns that various government agencies and organizations should be focusing on to alleviate or ease the SBE owner's concerns. The research is significant as it renders a systematic approach to decision-making using the AHP technique. Since no such studies were previously conducted, the research provides an avenue to future researchers for a broader sample and a framework for similar complex decision-making problems.

2. Literature review

2.1 Health care reform

Plans for health care reform started in 1912 when President Theodore Roosevelt attempted to provide health insurance to U.S. citizens (Parks, 2011). His efforts did not succeed because of opposition from political leaders, businesses, and the insurance industry to socialized medicine (Parks, 2011). However, public-private partnership did evolve to provide health insurance to U.S. citizens (Parks, 2011). After World War II, several presidents, including Harry Truman, Richard Nixon, James Carter, and William Clinton, tried to pass a universal health insurance law (Oberlander, 2012). Again, mistrust

in U.S. federal government control, political opposition, and opposition from business and industry contributed to the failure of passage of a health insurance law (Gable, 2011; Oberlander, 2012).

The passage of the 1965 Medicare and Medicaid Act allowed U.S. government programs to insure the more vulnerable elderly and low-income population (Oberlander, 2012). In 2006, Massachusetts implemented health care reform that provided a framework for comprehensive health care. Eventually, in 2010, following acrimonious and political wrangling of lawmakers, the ACA became a law (Oberlander, 2012).

According to Gardner (2012), the ACA encompasses a vision to invest in new infrastructure for improving the quality and reducing the cost of health care. In addition, improving the quality of information, infrastructure, and incentives are all primary objectives of the ACA (Gardner, 2012). Moreover, Gardner recommended changing the provider-payer system from a fee-for-service to value-based service for successful implementation of the ACA. Taking a contrasting view, Wilensky (2012) remarked that U.S. health care encountered 3 key problems: millions of uninsured people, high costs of health care, and diminishing quality of care. The ACA addressed only the first problem by expanding health care coverage to uninsured people.

Geyman (2012) argued consumer-driven health care was ineffective in controlling cost and contributed to restricted access, underutilization, and lower quality of health care. Consumer-driven health care relies on the premise of the moral hazard theory, which implies patients will over-utilize health care services without cost-sharing arrangements and so will contribute to rising cost of services. Geyman identified 3 issues which health care reform should address: (a) management and administration cost, (b) rising cost of health care, and (c) access to and quality of care.

2.2 Small business enterprise

In attempting to provide a legal definition of a small business, Eyal-Cohen (2013) asserted that there was a lack of a standard definition in both business and industry. According to Eyal-Cohen, legal definitions of a small business vary in sections of the law. For a legal definition, a firm's size was not an important measure (Eyal-Cohen, 2013). Thus Eyal-Cohen provided a comprehensive definition of a small business based on securities law, health care coverage, labor and employment, patent law, and internal revenue code. Eyal-Cohen described the small employer as an employer hiring up to 100 employees. However, as stated in Healthcare (n.d.), SBEs can have only up to 50 FTE employees.

Miller, Eibner, and Gresenz (2013) conducted a study of the impact of financial regulatory arbitrage of employment-based, self-insured plans on employees. These programs received the exempt status from the provisions of the ACA and were not under the purview of state health insurance regulations. Miller et al. (2013) evaluated employee concerns about: (a) employer's financial stability, (b) health benefits and claims adjudication, and (c) appeal process. The findings revealed similarities of health benefits between self-insured and fully insured plans. According to Miller et al. (2013), the ACA would improve appeal processing for both types of insurance plans.

Kapur, Karaca-Mandic, Gates, and Fulton (2012) examined the relationship between the size of a small business and small group health insurance regulations for offering health insurance to its employees while controlling health insurance costs. Remarking on these regulations, Kapur et al. (2012) noted small group insurance reform regulated insurance policies based on a business size threshold, from 2 or 3 employees to 25 or 50 employees. To ascertain the quality of jobs that included health care coverage, Litwin and Phan (2013) revealed start-up business owners did not provide health and retirement benefits. The probability of providing such benefits slightly improved following 6 years of business operation (Litwin & Phan, 2013).

2.3 SBE owner's concerns

Speculating how many employers would stop offering health insurance coverage to their employees, Buchmueller, Carey, and Levy (2013) examined theoretical and empirical evidence of health insurance changes since the enactment of the ACA. Employer-sponsored health insurance had 3 advantages over the individual market: (a) no income tax on insurance premiums, (b) adverse selection mitigation, and (c) economies of scale. However, the complexity of the law that SBE owners misunderstood rendered small employers confused and indecisive about relevant provisions of the ACA (Buchmueller, Carey, & Levy, 2013).

Addressing the issues of health care and financial planning attributed to the ACA, Cordell and Langdon (2011, 2012) remarked that the rules for tax savings from various pretax accounts would change. Small business employers would either offer health coverage or pay additional nondeductible tax for every full-time employee (Cordell & Langdon, 2012). The individual mandate tax could prevent SBE owners from adding another FTE.

In a survey of U.S. small businesses, Jacobe (2013a) reported 48% of the SBE owners thought the ACA was inadequate for their business. A Gallup survey conducted in April 2013 with 603 SBE owners also revealed 52% of employers said the ACA would reduce quality of care, and 55% thought cost of health care would increase (Jacobe, 2013a). In another survey, Jacobe (2013b) reported key concerns of SBE owners were health care costs (54%), taxes on businesses (53%), and U.S. government regulations (46%).

Lepard (2013) presented a legal issue with the contraceptive coverage mandate of the ACA and religious rights of corporations. In the absence of a final decision, Lepard recommended that the U.S. Congress should either include for-profit corporations in the religious employer exemption or require the U.S. government to provide free contraceptive coverage. Similar to Lepard's argument, Loewentheil (2014) argued for religious accommodations based on the free exercise rights whenever such accommodations impose any burdens on others. Loewentheil (2014) used the example of contraceptive coverage mandate of the ACA to explain the failure of existing principles supporting religious accommodations. Loewentheil (2014) proposed a theoretical framework, balancing the burdens on both religious rights of objectors and supporters.

Consolidating results from several studies, McMorrow, Blumberg, and Buetgens (2011) reported effects of the ACA on SBEs. They pointed out administrative costs and limited ability to spread risks adversely affected small businesses because of the ACA. However, tax credits were helpful to SBE owners to provide health insurance to their employees.

Miller (2011) remarked that the cost of health insurance coverage during a 10-year period ending in 2009 increased by 123% for small to medium-sized businesses. During the same period, insurance coverage dropped from 65% to 59% for small to medium-sized businesses and from 56% to 46% for very small businesses. Miller (2011) commented that several factors such as subsidies and premiums could affect the ability of SBE owners to provide health insurance coverage based on the ACA. Miller (2011) pointed out that an increase in health insurance coverage of small business employees would depend on available subsidies and insurance premiums.

In reviewing the impact of the ACA on employer-sponsored health insurance plans, Tacchino (2013a) explained that rising insurance premiums and play-or-pay tax requirements of the ACA became an opportunity for employers to reevaluate their existing plans and offer coverage through health insurance exchanges. Specifically, Tacchino (2013b) reviewed criteria for identifying employers impacted by the tax and the method of calculating potential employer tax liability. SBE owners either met the requirements or incurred a tax liability for FTEs without health insurance coverage or unaffordable minimum essential health insurance coverage.

3. Methodology

For the purpose of prioritizing the SBE owner's concerns, we used the AHP technique. In general, researchers can apply the AHP method to solve decision-making problems that involve (a) the selection of an alternative, (b) the prioritization of factors or criteria, or (c) the evaluation of homogeneous criteria (Al-Hawari, Al-Bo'ol, & Momani, 2011; Saaty & Shang, 2011; Talib, Rahman, & Qureshi, 2011). More importantly, researchers can use AHP to address decision-making problems that involve a mix of qualitative and quantitative criteria (Ishizaka & Labib, 2011). In order to be able to model and solve prioritization problems with the AHP technique, researchers rely on the judgment of pairwise comparison criteria using a ratio, verbal, or graphical scale (Talib et al., 2011). The AHP method begins with a qualitative approach for determining the objective, criteria, and sub-criteria and structuring these into a hierarchy. Furthermore, the AHP method requires a quantitative approach for pairwise comparison, consistency checking, and aggregation of judgments.

We used the following 8 steps of the AHP method for conducting the study of the research problem as shown in Figure 1.

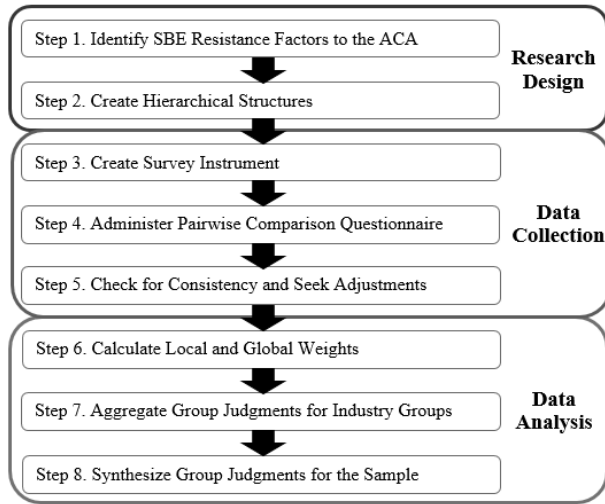


Figure 1. Steps of the Analytic Hierarchy Process (AHP) method

In Step 1, we identified the following 9 SBE owner's concerns from the reviewed literature:

- Administrative Cost
- Complexity of ACA
- Insurance Premium
- Penalty
- Plan Choice
- Quality of Care
- Religious Objection
- Reporting Burden
- Tax Burden

In Step 2, we created an AHP structure with these 9 SBE owner's concerns for further research. We used freely-available online software, AHP-OS, to form and display the hierarchical structure as shown in Figure 2 (Goepel, 2013). The software attaches initial values capturing the default local and global priorities of the SBE owners concerns at each level of the hierarchy. Level 0 of the hierarchy represents the overall goal of the AHP analysis, Level 1 represents the aggregate concerns or criteria, and Level 2 represents the specific concerns or sub-criteria of the AHP hierarchy.

Level 0	Level 1	Level 2	Global Priorities
Prioritize SBE Concerns	Health Insurance Cost 0.5	Administrative Cost 0.25	12.5 %
		Insurance Premium 0.25	12.5 %
		Penalty 0.25	12.5 %
		Tax Burden 0.25	12.5 %
	Health Insurance Coverage 0.5	Complexity of ACA 0.2	10.0 %
		Plan Choice 0.2	10.0 %
		Quality of Care 0.2	10.0 %
		Religious Objection 0.2	10.0 %
		Reporting Burden 0.2	10.0 %
			1.0

Figure 2. AHP structure with initial or default priorities

In Step 3, we utilized the identified structure from Step 2 and Figure 2 and created a pairwise comparison survey instrument within the AHP-OS software. The scale of measurement was a ratio scale known as Saaty’s fundamental scale (Saaty & Vargas, 2012). The scale is derived from Thurstone’s scale designed for pairwise comparisons and uses an importance rating on a scale of 1 to 9. That is, in comparing A to B, the comparison requires that the participant decide 2 things: “Is A more important than B or B more important than A?”, and “How much more important is one from the other?”. For example, “A is more important than B” and “7” on the scale from 1 to 9.

With m items to be compared within a given level, a total of $m(m-1)/2$ comparisons are needed. Our pairwise comparison survey consisted of 3 parts. Part 1 contained 2 items at Level 1 thus a total of $2(2-1)/2 = 1$ comparison between the choices “Health Insurance Cost” vs “Health Insurance Coverage”. Part 2 of the questionnaire contained 4 sub-criteria under “Health Insurance Cost” and thus $4(4-1)/2 = 6$ pairwise comparison questions. Part 3 of the questionnaire contained 5 sub-criteria under the “Health Insurance Coverage” node and thus $5(5-1)/2 = 10$ pairwise comparison questions. Thus a total of $1+6+10=17$ pairwise comparison questions had to be answered by each participant. The entire questionnaire captured with AHP-OS software is as shown in Figure 3.

A - wrt Prioritize SBE Resistance - or B?		Equal	How much more?								
<input checked="" type="radio"/> Health Insurance Cost	or	<input checked="" type="radio"/> Health Insurance Coverage	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5	<input type="radio"/> 6	<input type="radio"/> 7	<input type="radio"/> 8	<input type="radio"/> 9
<input checked="" type="radio"/> Administrative Cost	or	<input checked="" type="radio"/> Insurance Premium	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5	<input type="radio"/> 6	<input type="radio"/> 7	<input type="radio"/> 8	<input type="radio"/> 9
<input checked="" type="radio"/> Administrative Cost	or	<input checked="" type="radio"/> Penalty	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5	<input type="radio"/> 6	<input type="radio"/> 7	<input type="radio"/> 8	<input type="radio"/> 9
<input checked="" type="radio"/> Administrative Cost	or	<input checked="" type="radio"/> Tax Burden	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5	<input type="radio"/> 6	<input type="radio"/> 7	<input type="radio"/> 8	<input type="radio"/> 9
<input checked="" type="radio"/> Insurance Premium	or	<input checked="" type="radio"/> Penalty	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5	<input type="radio"/> 6	<input type="radio"/> 7	<input type="radio"/> 8	<input type="radio"/> 9
<input checked="" type="radio"/> Insurance Premium	or	<input checked="" type="radio"/> Tax Burden	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5	<input type="radio"/> 6	<input type="radio"/> 7	<input type="radio"/> 8	<input type="radio"/> 9
<input checked="" type="radio"/> Penalty	or	<input checked="" type="radio"/> Tax Burden	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5	<input type="radio"/> 6	<input type="radio"/> 7	<input type="radio"/> 8	<input type="radio"/> 9
<input checked="" type="radio"/> Complexity of ACA	or	<input checked="" type="radio"/> Plan Choice	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5	<input type="radio"/> 6	<input type="radio"/> 7	<input type="radio"/> 8	<input type="radio"/> 9
<input checked="" type="radio"/> Complexity of ACA	or	<input checked="" type="radio"/> Quality of Care	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5	<input type="radio"/> 6	<input type="radio"/> 7	<input type="radio"/> 8	<input type="radio"/> 9
<input checked="" type="radio"/> Complexity of ACA	or	<input checked="" type="radio"/> Religious Objection	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5	<input type="radio"/> 6	<input type="radio"/> 7	<input type="radio"/> 8	<input type="radio"/> 9
<input checked="" type="radio"/> Complexity of ACA	or	<input checked="" type="radio"/> Reporting Burden	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5	<input type="radio"/> 6	<input type="radio"/> 7	<input type="radio"/> 8	<input type="radio"/> 9
<input checked="" type="radio"/> Plan Choice	or	<input checked="" type="radio"/> Quality of Care	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5	<input type="radio"/> 6	<input type="radio"/> 7	<input type="radio"/> 8	<input type="radio"/> 9
<input checked="" type="radio"/> Plan Choice	or	<input checked="" type="radio"/> Religious Objection	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5	<input type="radio"/> 6	<input type="radio"/> 7	<input type="radio"/> 8	<input type="radio"/> 9
<input checked="" type="radio"/> Plan Choice	or	<input checked="" type="radio"/> Reporting Burden	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5	<input type="radio"/> 6	<input type="radio"/> 7	<input type="radio"/> 8	<input type="radio"/> 9
<input checked="" type="radio"/> Quality of Care	or	<input checked="" type="radio"/> Religious Objection	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5	<input type="radio"/> 6	<input type="radio"/> 7	<input type="radio"/> 8	<input type="radio"/> 9
<input checked="" type="radio"/> Quality of Care	or	<input checked="" type="radio"/> Reporting Burden	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5	<input type="radio"/> 6	<input type="radio"/> 7	<input type="radio"/> 8	<input type="radio"/> 9
<input checked="" type="radio"/> Religious Objection	or	<input checked="" type="radio"/> Reporting Burden	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5	<input type="radio"/> 6	<input type="radio"/> 7	<input type="radio"/> 8	<input type="radio"/> 9

Figure 3. AHP-OS Pairwise Questionnaire of SBE concerns on ACA

3.1 Population and sampling

The AHP analysis was based on a sample of 50 SBE owners representing 5 industry groups in Richmond, Virginia. To begin with, we conducted an online search of small business enterprises within Richmond, Virginia, and provided subcategories of business industries similar to those provided by U.S. Small Business Administration (n.d.). The classification of industries resulted in 5 industry groups (IGs) as shown in Table 1. A total of 150 SBE's were selected to form the sample population.

Table 1
SBE Industry Group Code, Name, and Classification

Code	Name	Industry Group
		Key Industries
IG1	Construction, Housing, & Real Estate	Construction, Housing, Commercial and Residential Real Estate
IG2	Food, Beverages, Consumer Goods, & Services	Food, Beverage, Restaurants, Retail Goods and Services
IG3	Health care, Pharmaceuticals, & Biotechnology	Dental and Medical Clinics, Pharmaceutical, Health care Facilities and Services
IG4	Financial, Legal, & Professional Services	Accounting, Financial, Educational, Legal, and Professional Services
IG5	Remaining Goods & Services	Agriculture, Automotive, Energy, Technology, Transportation and Logistics

Next, a decision on the total sample size and then on the sample size within each industry group had to be made. Beginning with the total sample size, a value of 50 was decided based on a number of considerations. First, the strength of the AHP technique is that it requires no minimum sample size and thus researchers can conduct a study using even a single participant (Ramanathan, 2001). However, this may introduce the single participant’s bias in research findings. On the other extreme, larger sample sizes (in excess of say 50 participants) can introduce a higher chance of inconsistent comparisons across the participants (Aull-Hyde, Erdogan, & Duke. 2006; Saaty & Vargas, 2012). Second, the proximity to the sampled participants within the defined population frame was considered in deciding that a sample size of 50 SBE participants across 5 industry groups of interest was deemed right for this particular AHP application.

Once the total sample size of 50 was decided, the next task was to spread it roughly evenly across the 5 industry groups so that each can receive an equal chance of representation. Once the counts within each IG were decided, the actual sample of SBE’s within each IG was drawn randomly using Excel’s RAND() function. Upon receiving survey results from 10 participants in each industry group, we stopped seeking further participation. The population and sample counts by IG are summarized in Table 2 below.

Table 2
Population and Participation Counts by Industry Group

Industry Group ID	Sample Population	SBE Owners Approached	SBE Owners Participated	Percentage Participation
IG1	30	16	10	10/16 = 63%
IG2	30	19	10	10/19 = 53%
IG3	30	13	10	10/13 = 77%
IG4	30	13	10	10/13 = 77%
IG5	30	18	10	10/18 = 56%
Total	150	79	50	50/79 = 63%

As seen in Table 2, the total sample of 50 was cross-sectional as it roughly represented over 50% of participants across each of the 5 industry groups.

3.2 Data collection and analysis

In Step 4, we administered the pairwise survey to the random participants of the SBE industry groups and ensured their responses were consistent by checking them in real time. Specifically, each participant answered the pairwise comparison question first by choosing the importance of the SBE owners concern, and then by rating its importance on a scale of 1 to 9. The participant finished the survey upon completing each part of the 3-part survey questionnaire to rank the group of concerns. The AHP-OS software automatically calculated the consistency ratio (CR) of the participant's responses for each part of the survey (Goepel, 2013). If the CR was no more than 10%, that part of the survey was acceptable for further analysis. If, however, the CR was more than 10%, the participant followed Step 5 of the AHP method.

In Step 5, the participant reviewed the final responses for possible remnant inconsistencies. The participant could adjust the responses to make them consistent and acceptable. The participant could make the adjustments either by using suggestions provided by the software logic or by changing the judgments slightly using the AHP-OS software (Goepel, 2013). The participant could also conduct iterative adjustments ensuring consistency of judgment to survey questions. Upon ensuring consistent responses by the participant, that part of the survey was acceptable for further analysis.

In Step 6 of the data analysis, we ported the data from AHP-OS software to specialized AHP Excel worksheets for aggregation (Goepel, 2013). Based on the hierarchical structure of the research problem and upon completion of the Step 6 on the collected data, the AHP-OS software yielded 150 matrices—50 2×2 matrices, 50 4×4 matrices, and 50 5×5 matrices—providing local priorities of SBE owner's concerns.

In Step 7, we aggregated the local priorities by industry groups and the sample by using the specialized AHP Excel worksheets (Goepel, 2013).

Finally, in Step 8, we synthesized the local priorities into global priorities by using standard Excel worksheets.

4. Results

In order to elaborate on the analysis results, we begin by demonstrating the consistency of judgment from the responses of a specific participant 1 in IG1 labelled IG1-1. To obtain the global priority weights of individual judgments, researchers apply synthesis of individual priorities that requires a multiplication of local priority weights by weights of all parent nodes (Bhatt & Macwan, 2012). The local priorities at each hierarchy level and the global priority of the concerns resulting from the responses of Participant IG1-1 are provided in the appendix.

Next, the synthesis and aggregation of local priorities of the survey participant's responses in the entire industry group IG1 resulted in the global priorities or overall weights of group judgments by multiplying local priorities at Level 1 and Level 2 of the AHP structure. Table 3 shows the synthesis of global priorities for IG1.

Table 3
Global Priority of IG1 Group Judgments

AHP Factor	Local Priority at Level 1	SBE Owners' Concern	Local Priority at Level 2	Global Priority.
Health Insurance Cost	0.719202	Administrative Cost	0.105585	0.075937
		Insurance Premium	0.591494	0.425404
		Penalty	0.128072	0.092110
		Tax Burden	0.174849	0.125752
Health Insurance Coverage	0.280798	Complexity of ACA	0.135166	0.037954
		Plan Choice	0.277329	0.077873
		Quality of Care	0.399727	0.112243
		Religious Objection	0.121882	0.034224
		Reporting Burden	0.065896	0.018503

Similarly, the synthesis and aggregation of local priorities of survey participant's responses for IG2 through IG5 are provided in the global priorities as shown in Table 4 through Table 7.

Table 4
Global Priority of IG2 Group Judgments

AHP Factor	Local Priority at Level 1	SBE Owners' Concern	Local Priority at Level 2	Global Priority.
Health Insurance Cost	0.646577	Administrative Cost	0.081469	0.052676
		Insurance Premium	0.656658	0.424580
		Penalty	0.138345	0.089451
		Tax Burden	0.123527	0.079870
Health Insurance Coverage	0.353423	Complexity of ACA	0.076807	0.027146
		Plan Choice	0.378897	0.133911
		Quality of Care	0.379973	0.134291
		Religious Objection	0.099916	0.035313
		Reporting Burden	0.064406	0.022763

Table 5
Global Priority of IG3 Group Judgments

AHP Factor	Local Priority at Level 1	SBE Owners' Concern	Local Priority at Level 2	Global Priority.
Health Insurance Cost	0.755880	Administrative Cost	0.097479	0.073682
		Insurance Premium	0.654540	0.494754
		Penalty	0.107995	0.081631
		Tax Burden	0.139986	0.105812
Health Insurance Coverage	0.244120	Complexity of ACA	0.159254	0.038877
		Plan Choice	0.284469	0.069445
		Quality of Care	0.399977	0.097643
		Religious Objection	0.081127	0.019805
		Reporting Burden	0.075173	0.018351

Table 6
Global Priority of IG4 Group Judgments

AHP Factor	Local Priority at Level 1	SBE Owners' Concern	Local Priority at Level 2	Global Priority.
Health Insurance Cost	0.645745	Administrative Cost	0.094409	0.060964
		Insurance Premium	0.629278	0.406353
		Penalty	0.107846	0.069641
		Tax Burden	0.168468	0.108787
Health Insurance Coverage	0.354255	Complexity of ACA	0.087786	0.031099
		Plan Choice	0.267709	0.094837
		Quality of Care	0.518829	0.183798
		Religious Objection	0.057251	0.020282
		Reporting Burden	0.068425	0.024240

Table 7
Global Priority of IG5 Group Judgments

AHP Factor	Local Priority at Level 1	SBE Owners' Concern	Local Priority at Level 2	Global Priority.
Health Insurance Cost	0.568874	Administrative Cost	0.072226	0.041088
		Insurance Premium	0.659648	0.375257
		Penalty	0.112333	0.063903
		Tax Burden	0.155793	0.088627
Health Insurance Coverage	0.431126	Complexity of ACA	0.093800	0.040440
		Plan Choice	0.223619	0.096408
		Quality of Care	0.520412	0.224363
		Religious Objection	0.107506	0.046349
		Reporting Burden	0.054663	0.023567

Displaying the rankings for the AHP hierarchy by industry groups based on global priorities as shown in Figure 4, the insurance premium was found uniformly to be the highest concern of SBE owners, with ranges between 38% and 50% in each industry group.

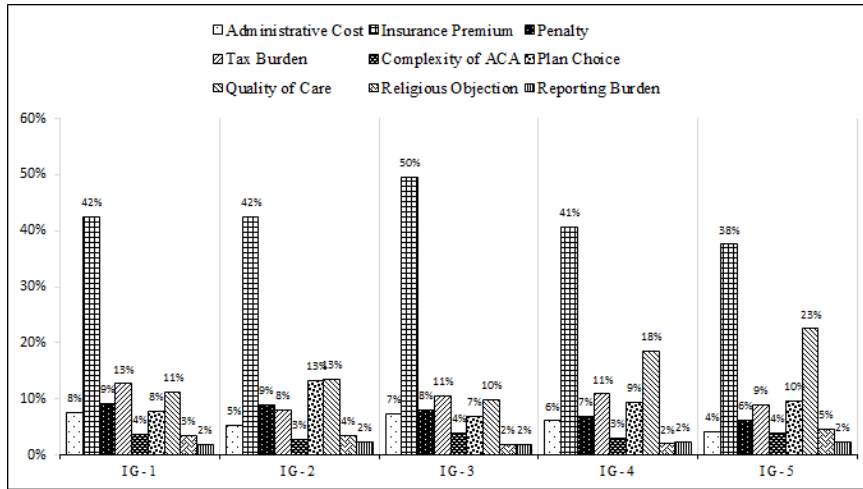


Figure 4. Global priorities of group judgments for industry groups

Reporting burden was the lowest concern of SBE owners consistently at 2% in each industry group. The ranking order of the remaining concerns varied in each industry group exhibiting the diversity of SBE owner’s opinions. Ishizaka et al. (2011) remarked that the reliability of the AHP technique is very high when consistent highest and lowest priority determination is established among participating groups. The results of SBE owner’s opinions confirmed the remarks of Ishizaka et al. (2011) by identifying insurance premium and reporting burden as the highest and the lowest priority respectively in each industry group.

Finally, the synthesis of aggregated local priorities of all participants (industry groups IG1 through IG5) resulted in the global priorities or overall weights of group judgments by multiplying local priorities at Level 1 and Level 2 of the AHP structure. Table 8 shows the global priorities for all participants.

Table 8
Global Priority of All Participants Group Judgments

AHP Factor	Local Priority at Level 1	SBE Owners’ Concern	Local Priority at Level 2	Global Priority
Health Insurance Cost	0.670218	Administrative Cost	0.089940	0.060280
		Insurance Premium	0.639574	0.428654
		Penalty	0.118023	0.079101
		Tax Burden	0.152463	0.102183
Health Insurance Coverage	0.329351	Complexity of ACA	0.107826	0.035512
		Plan Choice	0.286489	0.094355
		Quality of Care	0.447566	0.147406
		Religious Objection	0.091796	0.030233
		Reporting Burden	0.066324	0.021844

Synthesizing the local priority weights into composite or global priority weights, Figure 5 provides the overall picture of all SBE owners’ concerns in Richmond, Virginia. The insurance premium was the highest concern of all participants at 43% while reporting

burden was the lowest concern at 2%. The gap between the insurance premium and reporting burden was over 21 times considering all concerns. The SBE owner's concerns following insurance premium were quality of care, tax burden, and plan choice.

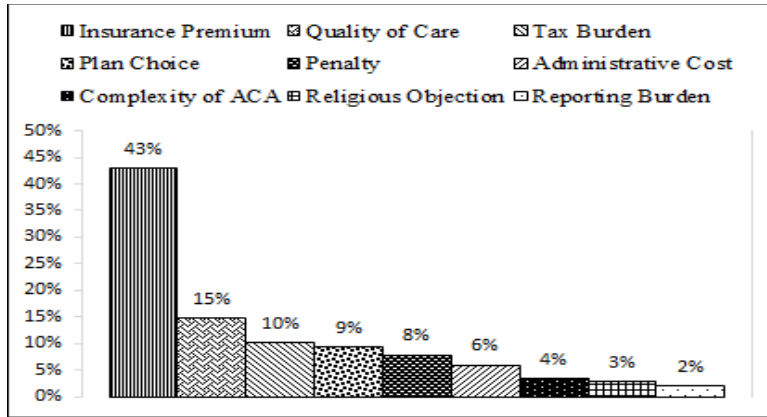


Figure 5 Ranking of SBE owners' concerns to the ACA

In fact, the insurance premium was almost 3 times a bigger concern than the next concern, quality of care. Moreover, the bottom 3 concerns complexity of ACA, religious objection, and reporting burden accounted for less than 10% of overall SBE owner's concerns. Insurance premium (43%) and quality of care (15%) were the only 2 concerns bigger than the average (11%) of all SBE owners' concerns.

5. Conclusions

The application of AHP began with the identification of known SBE concerns about ACA by utilizing a thorough literature review. From this literature, it was determined that SBE owners exhibited 9 specific concerns. These concerns were encapsulated in a pairwise comparison survey and administered to a sample of 50 SBE owners in Richmond, Virginia. Next, the application of AHP on the collected surveys provided a structure and ranking of these 9 ACA concerns to essentially verify their order of importance.

Specifically, the AHP analysis of the survey results revealed the following key findings:

- Among health insurance cost concerns, the insurance premium was the top-ranked concern followed by the tax burden.
- Among health insurance coverage concerns, quality of care was the top-ranked concern followed by plan choice.
- Among all participants, the top ranked concern was insurance premium followed by quality of care, tax burden, and plan choice. In addition, the bottom ranked concerns were the complexity of ACA, religious objection, and reporting burden.

- Among industry groups, the overall rankings of the concerns were not uniform. However, the insurance premium was the top-ranked and reporting burden, the bottom ranked concern of SBE owners in each industry group.

The recommendations to SBE owners, business organizations, U.S. government officials, and researchers are to consider the efficacy of the findings for seeking better ways to reduce SBE owner's concerns. The prioritization of SBE owner's concerns to the ACA also provides an opportunity for the U.S. health care industry to consider the key concerns for reducing their impact on businesses in the future. U.S. government officials could use these findings to disseminate useful informational materials to the business community for improving the perceptions of SBE owners. Because of the changes to health insurance coverage from the ACA, SBE owners could also utilize a representative voice to highlight those issues that are crucial to the financial success of a business. SBE owners could leverage this voice to influence the provisions of the ACA benefiting the entrepreneurs, employees, and society. SBE owners could seek to redress their concerns from appropriate authorities and find ways to mitigate any financial risks attributable to the concerns.

To further the study, researchers could conduct studies with a broader sample drawn from a population from various locations and other industry groups such as oil, manufacturing, and transportation, which were not prevalent in Richmond, Virginia. Researchers could also perform a correlational study involving key SBE owner's concerns and profitability. The findings from such further research could reveal the impact on profit margins of SBEs from key concerns to devise better approaches for mitigating risks. In addition, researchers could apply some simpler rank-generation techniques such as competition, ordinal, or fractional ranking techniques for comparison to AHP. If the techniques yield similar results, then researchers need not apply a complex MCDM technique such as AHP to similar research problems. Finally, given that insurance premium was the top-ranked SBE concern toward the ACA, researchers could further consider its sub-factors to understand the impact of the dominant sub-factor on profit margins.

We conducted the study to address the problem of prioritizing SBE owner's concerns and to foster a more shared understanding across industry groups and more importantly within a particular industry group. Examining the concerns about the ACA with the Analytic Hierarchy Process (AHP) filled a gap in the literature by ranking the concerns. The quantitative research study was conclusive, descriptive, and cross-sectional. The findings revealed the top ranked SBE owner's concern was insurance premium followed by quality of care and tax burden. The findings from this study offer SBE owners benefit to focus on critical concerns for reducing business costs of health care. Moreover, business organizations, researchers, and policymakers could channel SBE owner's voice for positive social change to address business concerns seeking improvements from the ACA.

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APPENDIX

The following tables resulted from the responses of participant 1 in IG1 labelled IG1-1. The responses to pairwise comparison questions by this particular participant for survey Part 1 were consistent with CR=0% indicating no inconsistencies at all. Next, the AHP analysis of the participant's responses for Part 1 of the survey yielded the 2x2 matrix. The normalized principal eigenvector or local priority shows the local ranking of the survey Part 1 at Level 1 of the AHP hierarchy.

A 2x2 Matrix from Participant IG1-1 Response to Survey Part 1

AHP Criteria	Health Insurance Cost	Health Insurance Coverage	Normalized Principal Eigenvector	Local Priority
Health Insurance Cost	1	5	0.833333	83%
Health Insurance Coverage	0.2	1	0.166667	17%

CR = 0.00

Next, the survey Part 2 for IG1-1 showed a CR=7% and a 4x4 matrix as follows. The normalized principal eigenvector or local priority shows the local ranking of survey Part 2 at Level 2 of the AHP hierarchy.

A 4x4 Matrix from Participant IG1-1 Response to Survey Part 2

SBE Owners' Concern	Administrative Cost	Insurance Premium	Penalty	Tax Burden	Normalized Principal Eigenvector	Local Priority
Administrative Cost	1	0.2	0.333333	0.333333	0.073637	7%
Insurance Premium	5	1	3	5	0.549502	55%
Penalty	3	0.333333	1	3	0.247618	25%
Tax Burden	3	0.2	0.333333	1	0.129244	13%

CR = .07

The survey Part 3 yielded a 5x5 matrix as follows. The normalized principal eigenvector or local priority shows the local ranking of survey Part 3 at Level 2 of the AHP hierarchy.

A 5x5 Matrix from Participant IG1-1 Response to Survey Part 3

SBE Owners' Concern	Complexity of ACA	Plan Choice	Quality of Care	Religious Objection	Reporting Burden	Normalized Principal Eigenvector	Local Priority
Complexity of ACA	1	5	4	0.5	5	0.304375	30%
Plan Choice	0.2	1	0.5	0.2	5	0.088876	9%
Quality of Care	0.25	2	1	0.2	5	0.119499	12%
Religious Objection	2	5	5	1	9	0.452127	45%
Reporting Burden	0.2	0.2	0.2	0.111111	1	0.035124	4%

CR = 0.08

A synthesis of normalized principal eigenvectors or local priority weights following the AHP hierarchical structure yielded the global priority weights of the responses of participant IG1-1 as follows.

Global Priority of Participant IG1-1 Judgments

AHP Factor	Local Priority at Level 1	SBE Owners' Concern	Local Priority at Level 2	Global Priority.
Health Insurance Cost	0.833333	Administrative Cost	0.073637	0.061364
		Insurance Premium	0.549502	0.457919
		Penalty	0.247618	0.206348
		Tax Burden	0.129244	0.107703
Health Insurance Coverage	0.166667	Complexity of ACA	0.304375	0.050729
		Plan Choice	0.088876	0.014813
		Quality of Care	0.119499	0.019917
		Religious Objection	0.452127	0.075354
		Reporting Burden	0.035124	0.005854