



LUND UNIVERSITY

## **Forensic Accounting Education**

**A study of curriculums in consideration of employer expectations**

by  
Weina Huang  
Max Ihlas

Lund University School of Economics and Management  
Department of Business Administration  
BUSN69 Degree Project in Accounting and Finance  
Spring 2017

Supervisor: Kristina Artsberg  
Examiner: Susanne Arvidsson

## Abstract

- Seminar date:** 31st of May 2017
- Course:** BUSN79 - Degree Project in Accounting and Finance
- Authors:** Weina Huang, Max Ihlas
- Advisor/s:** Kristina Artsberg
- Five key words:** Forensic Accounting, Education, Professional requirements, Curriculums, Contextual differences
- Purpose:** To investigate if the forensic accounting education offered by universities provides the knowledge and skills that are required by the forensic accounting profession.
- Methodology:** First, a qualitative content analysis of curriculums, with a mix between a deductive and inductive approach, is conducted. Second, an inductive quantitative content analysis of job advertisements is administered.
- Theoretical perspectives:** The collection of data follows a framework that was developed through the literature review on previous studies about the educational field of forensic accounting, the skills and knowledge of practitioners, job-related activities etc. Subsequently, the framework was adjusted to consolidate relevant factors that were identified during the data collection process.
- Empirical foundation:**
1. The curriculums of graduate and postgraduate forensic accounting degrees, which were retrieved through the universities' websites, from the United States (US), the United Kingdom (UK), Australia and China,
  2. The job advertisements of forensic accounting related jobs in the US, UK, Australia and China, which were retrieved from the job search engine 'indeed.com'
- Conclusions:**
1. Although the degrees provide a strong theoretical background, they lack the development of practical skills which are required by the profession.
  2. While bachelor programs provide more practical courses and basic accounting courses, the master degrees focus on the forensic accounting knowledge. Overall, they both lack the development of practical attributes.
  3. The US curriculums are the most adapted and closest to professional requirements since the forensic accounting field is the most developed in the US.

## **Acknowledgements**

We would like to express our sincerest gratitude to our supervisor Kristina Artsberg, who has supported our thesis with exceptional guidance and valuable comments.

Additionally, we would like to thank our families and friends for their encouragement.

Lund, 23rd of May 2017

Weina Huang

Max Ihlas

## Table of Contents

<b>1. Introduction</b> .....	<b>1</b>
<b>1.1 The Background of Forensic Accounting</b> .....	<b>1</b>
<b>1.2 The Definition</b> .....	<b>2</b>
<b>1.3 An Outlook</b> .....	<b>3</b>
<b>1.4 The Problem</b> .....	<b>4</b>
<b>1.5 The Research Question</b> .....	<b>5</b>
<b>1.6 Outline of the thesis</b> .....	<b>5</b>
<b>2. Methodology</b> .....	<b>7</b>
<b>2.1 Research Strategy</b> .....	<b>7</b>
<b>2.2 Research Design</b> .....	<b>7</b>
<b>2.3 Research Methods</b> .....	<b>8</b>
2.3.1 Method for Literature Review.....	8
2.3.2 Method for Data Collection.....	9
2.3.3 Method for Data Analysis.....	10
<b>2.4 Sources of Data</b> .....	<b>11</b>
<b>2.5 Criteria for the Research</b> .....	<b>12</b>
2.5.1 Reliability.....	12
2.5.2 Validity.....	12
<b>2.6 Method Limitations</b> .....	<b>13</b>
Limited amount of job advertisements.....	13
Subjectivity.....	14
<b>3. Literature Review:</b> .....	<b>16</b>
<b>3.1 Difference to Auditing</b> .....	<b>16</b>
<b>3.2 Difference to Fraud examinations</b> .....	<b>18</b>
<b>3.3 Role of the Forensic Accountant</b> .....	<b>19</b>
<b>3.4 Qualities and Characteristics of Forensic Accountants</b> .....	<b>21</b>
<b>3.5 Preventive &amp; Detective Methods</b> .....	<b>23</b>
3.5.1 Fraud Detection Methods.....	23
3.5.2 Fraud Prevention Methods.....	24
<b>3.6 Cultural Context</b> .....	<b>25</b>
<b>3.7 Education</b> .....	<b>28</b>
<b>3.8 The Curriculums - Our Framework</b> .....	<b>28</b>
<b>4. Findings</b> .....	<b>32</b>
<b>4.1 Curriculum Findings</b> .....	<b>32</b>
<b>4.2 Job Advertisements</b> .....	<b>36</b>
4.2.1 The Framework for the Job Advertisements.....	37
4.2.2 The Job Advertisement Findings.....	40
<b>5. Discussion</b> .....	<b>45</b>
<b>5.1 Curriculums vs Job Advertisements</b> .....	<b>45</b>
5.1.1 Basic (Accounting) Knowledge.....	47
5.1.2 Forensic Accounting Knowledge.....	47
5.1.3 Other Important Skills.....	48
5.1.4 Technical Skills.....	50
<b>5.2 Type of Degree</b> .....	<b>51</b>
<b>5.3 Contextual differences</b> .....	<b>54</b>
<b>6. Summary and Conclusion</b> .....	<b>58</b>
<b>6.1 Theoretical Implications</b> .....	<b>59</b>
<b>6.2 Practical Implications</b> .....	<b>60</b>

<b>6.3 Future Research.....</b>	<b>60</b>
<b>6.4 Limitations .....</b>	<b>60</b>
<b>7. Reference List .....</b>	<b>62</b>
<b>Appendix A - Key terms used for recording attributes stated in job ads.....</b>	<b>67</b>
<b>Appendix B - List of all individual Job names.....</b>	<b>68</b>

# **1. Introduction**

In the following passages, we would like to introduce the field of forensic accounting. This rather new branch of accounting is often unfamiliar to academics since the research is relatively limited compared to other accounting areas. Therefore, we will first elaborate on the background and relevant history. Then, we are going to present a definition to highlight the dimensions of forensic accounting. Afterwards, we briefly describe the state of the field and express what developments could be expected. Based on the discussed information we will problematize the lack of cross-national studies regarding forensic accounting education. Finally, after the disclosure of our research question, we will conclude this chapter with an outline of the remaining parts of the thesis.

## **1.1 The Background of Forensic Accounting**

In the field of accounting, 'forensic accounting' is a relatively new domain, although, some of its ideas and techniques have already been around for centuries. For a long time, forensic accounting has not been considered as distinct from auditing or the traditional accounting practice (Smith, 2015). While researchers now recognize a distinction between auditing and forensic accounting, there is also a dispute if forensic accounting constitutes an individual profession as suggested by Özkul and Pamukçu (2012). Alternatively, it could likewise only represent an important niche in the accounting profession, which is likely to become an individual profession in the future (Huber, 2012). This lack of consensus probably stems from the complementary history that forensic accounting shares with the traditional accounting and auditing professions. Initially, during the first half of the 20th century, it was the accountant's as well as auditor's responsibility to safeguard the assets of a client and, hence, it was also their duty to ensure that there is no occurrence of fraud committed by the client's employees (Smith, 2015). However, when standards for the auditing practice were beginning to evolve, auditors were expected to provide assurance to the third party financial statement users of their clients. Thus, auditors had to become more independent than it has previously been the case. During the 1930s, the audit profession restrained from its early emphasis on fraud and focused instead on a standardization of audit procedures for the issuance of an opinion on financial statements (Smith, 2015). According to Smith (2015), the auditor's responsibility for assuring the absence of fraud was appropriately rejected in 1951 by the release of the "Codification of Statements on Auditing Procedure" (p.9) by the American Institute of Certified Public Accountants (AICPA). In this release, it is stated that an auditor's work is not designed to identify defalcations. After this statement, other organizations such as the Committee on Auditing Procedures (CAP) joined

the response to the concern that companies were becoming too big for the extensive responsibilities of auditors (Smith, 2015).

Furthermore, Smith (2015) argues that during that decade the expectation gap developed considerably because the expectations of the public remained the same while the accounting profession limited the auditor's responsibility. As a result, there was new room for other professions to fill this critical gap. During this time, the term 'Forensic Accounting' was formulated by Max Lourie in 1953 (Smith, 2015). Lourie originally used this terminology, 'forensic', to refer to the presentation of financial criminal evidence in court (Smith, 2015). Nowadays, forensic accountants are not solely investigating defalcations for the presentation of evidence in court after the request of an attorney (Washavsky, 2013), but they provide a much larger set of services. According to Warshavsky (2013) some other typical types of litigation services of forensic accountants are: the valuation of a business during a shareholder or partner dispute; asset-tracing procedures for matrimonial dissolutions; the determination of damages after a breach of contract; or the investigation of claims of fraud during bankruptcy procedures. Moreover, forensic accountants are not only responsible for investigating cases in hindsight but are likewise offering their support in the proactive prevention of fraud and other crimes. Even the prevention of cybercrimes is now part of the new expanded territory of the forensic accounting field (Smith, 2015). Currently, the type of employers for forensic accountants range from the 'Big Four' accounting firms, which have established forensic accounting departments, to other private consulting companies as well as "lawyers, law enforcement agencies, insurance companies, government organizations or financial institutions" (ACFE F.A. Career Path, 2017).

## **1.2 The Definition**

The extent of services that one may expect from forensic accountants depends on the definition that one uses to describe the domain. Since forensic accounting is a relatively new field there have been many attempts by researchers to find the best fitting definition. The broader a researcher's definition, the broader is his or her perspective on the field. If, for example, one defines the forensic accounting function as an investigation into the breach of trusted relationships (Smith, 2015), the forensic accountant's work would be limited to the work of fraud examiners. This restricted perspective constitutes a mistake as fraud examinations are only one domain of forensic accounting. Instead, Huber and DiGabriele (2014) suggest understanding forensic accounting as a social field that is dependent on its social context. This broader research extent is more likely to offer practical guidance as it allows the inclusion of

future issues, such as cybercrime, into the forensic accounting field. Huber and DiGabriele (2014) define forensic accounting as:

*"a multidisciplinary field that encompasses both a profession and an industry, where civil or criminal economic and financial claims, whether business or personal, are contested within established political structures, recognized and accepted social parameters, and well-defined legal jurisdictions, and informed by the theories, methods, and procedures from the fields of law, auditing, accounting, finance, economics, psychology, sociology, and criminology."* (p.45)

This definition illustrates that forensic accounting is not just a mix between accounting and law. Forensic accounting is a multidisciplinary field that goes far beyond the traditional accounting field. Yet, it bears likewise many similarities to other domains of accounting, for example auditing. Applying this broad perspective allows the forensic accounting professionals to meet the emerging demand that has previously not been met by the traditional accounting profession since the restricted of an auditor's responsibility.

### **1.3 An Outlook**

The fact that auditors are not adequately equipped to deal with fraud has also been reported by the Public Company Accounting Oversight Boards (PCAOB) who found that auditors would not be able to effectively adjust their procedures in response to an increased possibility of fraud (Hoffman & Zimbelman, 2009). This failure of auditors to adequately address fraud has ultimately led to many corporate scandals. According to Özkul and Pamukçu (2012), these scandals have lowered the public's trust in the accounting profession which in turn has been pivotal for the forensic accounting domain. Since the traditional accounting profession has failed to adequately prevent and detect scandals, forensic accounting has become a quickly growing field, which is expected to grow from \$4.5 billion revenue in 2013 to \$6.3 billion by 2018 (Chiang, 2013). As a result, there is an increasing number of researchers interested in this domain. Nevertheless, as their perspectives vary, due to the social context, there are many different research approaches that follow various legal, taxation, cultural, ethical, and economic contexts. Overall, the forensic accounting literature is predominantly North American. Since forensic accounting has started in the mid 20th century, it developed very quickly into a domain of accounting which many of the formal accounting organizations recognize. Some of the supportive organizations of forensic accounting include: the Association of Certified Fraud Examiners (ACFE), the Association of Certified Fraud Specialists (ACFS), the American



Institute of Certified Public Accountants (AICPA) and the National Association of Certified Valuation Analysts (NACVA) (Özkul & Pamukçu, 2012). Among the possible certifications that forensic accountants can obtain to prove their competences are the Certified in Financial Forensics (CFF), Certified Forensic Accountant (Cr.FA), Certified Forensic Investigator (CFI), Chartered Certified Forensic Accountant (CCFA) and the Forensic Certified Public Accountant (FCPA) (Smith, 2015).

Though despite the continuous growth in demand for forensic accountants, the profession is neither regulated nor is there an actual agreement on the requirements that should be met by forensic accountants (Huber, 2013). In the future, Huber (2012) argues that the currently "fledgling profession" of forensic accounting will evolve into a formally accepted profession, once an oversight body, e.g. government or independent private agency, is established. After all, the prevention and investigation of financial crimes have always and will always be an essential endeavour that should be pursued by accountants.

#### **1.4 The Problem**

Considering these developments (the restriction of an auditor's responsibility for the detection of fraud; the occurrence of famous fraud cases and corporate scandals which raised the demand for forensic accountants; and the growth of the domain beyond fraud and litigation into new areas, such as cybercrime), we would expect the demand for appropriate bachelor and master degrees to increase. For that reason, some researchers have already set out to investigate and find suitable curriculums for future forensic accountants. However, similarly to the rest of forensic accounting research, these curriculum studies have solely focused on one country: Davis, Farrell and Ogilby (2013) on the US; Razaee, Ha and Lo (2014) on China; Johnson-Rokosu (2015) on Nigeria. While the authors may provide some anecdotal comparisons between two countries, there is still an overall lack of evidence and understanding, how the field of forensic accounting develops worldwide. This constitutes a problem because it may further stray the view on the field apart. In this respect, the lack of consensus on the requirements for a forensic accountant, and how these differ to those of accountants and auditors, is just one problem caused by the rapid development of the field. Additionally, the shortage of cross-country studies leads to a lack of applicability as the findings from one country may lead to complete different findings in another. The field of forensic accounting should be understood as a social field and, hence, its context changes in every country. Particularly, as forensic accounting is a rather new field, the various countries may be at different development stages.

Overall, the problem we see with the current field of forensic accounting is that due to the rapid development of the field, quick growth in demand for forensic accountants and lack of consensus among researchers, there is a high likelihood that universities have difficulties to understand and adapt to the forensic accounting profession. Especially, if we bear in mind that most forensic accounting research is conducted in the US. Thus, the universities from other countries will lack a country specific theoretical foundation for the formulation of forensic accounting curriculums. As a result, it is unclear if the newly composed forensic accounting degrees provide content that is suitable and required for being a forensic accountant. Therefore, we would like to provide a cross-national analysis of the forensic accounting education offered by universities and investigate how these degree's contents match the professional requirements. For that reason, we will likewise record the requirements for forensic accountants that are stated in job advertisements in the United States (US), the United Kingdom (UK), Australia and China, since the ads outline the desired attributes, skills, knowledge areas etc. As a result, our study aims to highlight, to what extent the forensic accounting degrees offer the educational foundation that is required of forensic accounting professionals.

## **1.5 The Research Question**

Correspondingly we formulated the following research question:

1. What knowledge and skills do forensic accounting degrees provide and do these, match the attributes that are required by the profession?
  - How do these findings differ between graduate and postgraduate degrees?
  - How do these findings differ between countries?

## **1.6 Outline of the thesis**

### Chapter 2: Methodology

In this section, we will discuss our methodology. Hence, we elaborate on the chosen research strategy, research design, research method, the sources of data, criteria for our research and problems of our method, and explain why we have made these decisions.

### Chapter 3: Literature Review

This chapter comprises an extensive literature review concerning the following topics: the differences of forensic accountants and auditors; the differences of forensic accountants and fraud examiners; the role of forensic accountants; required qualities and characteristics of practitioners; the detective and preventive methods used by the profession; the differences between countries; and the educational aspects of forensic accounting. We decided to maintain a rather broad literature review since it is essential to understand the various elements of the profession. With the use of the reviewed literature and the subsequent findings, we will conclude this section with a formulation of a framework that we later utilize for the analysis of the curriculums.

### Chapter 4: Findings

This part of our thesis presents our findings. Additionally, we discuss other relevant information concerning our sample and data collection.

### Chapter 5: Discussion

This chapter encompasses our discussion and analysis of the findings. First, we utilize the data from the job ads to analyse the findings from the curriculums. Second, we will explore the differences in results between the bachelor and master degrees in our sample. Third, we investigate how the findings differ between the US, UK, Australia and China.

### Chapter 6: Conclusion

In the conclusion section of our thesis, we will summarize our study and discuss the theoretical and practical implications of our findings as well as the limitations of our study.

## **2. Methodology**

In this section, we will elaborate on our chosen research strategy, research design, research method, the sources of data, criteria for our research and problems of our method.

### **2.1 Research Strategy**

According to Bryman and Bell (2011), the research strategy refers to the overall orientation of a research study and can be divided into two distinctive directions: quantitative research and qualitative research. To investigate what knowledge the forensic accounting curriculums offer, and how these differ between countries, we consider the qualitative research to be a better choice as it tends to be of an inductive nature and can be conducted by interviews, observations, ethnography, focus groups or text analysis. However, it should be noted, that whilst our method is inductive, it also shares deductive components because we draw from findings of current literature to develop a starting framework that will then be adjusted during the data collection. As stated by Bryman and Bell (2011) it is not uncommon to use an iterative strategy, where one does not solely focus on the theory, deductive, or the data, inductive, during the data collection but rather contrasts them both to ensure a well-adjusted research method. The investigation is based on the focus group ‘universities’, and provides us with an objective view of the current educational state in the field of forensic accounting.

Since the data about the educational needs must be analysed with data concerning the professional requirements for forensic accountants, we must integrate a secondary component for the collection of recruitment data to our research strategy. While the curriculum investigation will be the result of a qualitative method, our research regarding the professional requirements follows a quantitative approach as we record the frequency of the desired characteristics and attributes in the sample of advertisements. The quantitative approach enables an easier comparison and analysis of the qualitative data from the curriculums. Compared to the qualitative part of our study, this part will follow an inductive approach as it will be constructed regarding the data collected for the curriculum analysis.

### **2.2 Research Design**

Bryman & Bell (2011) explain that the research design provides studies with a framework for the data collection and analysis. They consider that research designs can be categorized in five different types: experimental design; cross-sectional design; longitudinal design; case study design and comparative design. In this study, we apply a type of comparative design which requires data collection from two or more contrasting cases while using identical methods. A

more obvious form of this design is called 'cross-cultural' or 'cross-national' research. It mainly focuses on the logic of comparison between different cases, especially data from two or more nations, so that one can develop a better understanding of a social phenomenon. In our study, we believe that it is essential to use a cross-national research on different universities' curriculum settings in addition to the job postings for relevant positions. After all, we have to understand the current situation of the forensic accounting education in the light of the professional requirements around the world, in order to determine if the education provides the knowledge and skills that are not provided by other degrees and necessary for the forensic accounting profession.

## **2.3 Research Methods**

This part consists of three sections: literature review method, data collection method and data analysis methods.

### **2.3.1 Method for Literature Review**

Since it is critical to develop a better understanding on forensic accounting, we did a preliminary literature review by searching for the relevant keywords 'forensic accounting' and 'forensic accountant' in databases such as LUBsearch, Google Scholar and via regular Google searches. We searched likewise some foreign databases in Chinese and German to broaden our comprehension of the field. According to the preliminary collection of articles, we found that most articles, related to the domain of fraud examination, thus, we added “financial fraud” and “fraud” as keywords to the extended literature research. After we have gained a brief understanding of this research field, by reading the articles that explained some general problems in this area, we carried out a deeper inquiry by searching for more professional and authoritative articles through an exploration of the content of some classic and famous journals in the accounting and auditing fields such as Accounting Review, Accounting Horizons, Journal of Accounting Research, Harvard Business Review etc. Whenever the title of a research paper shows an obvious link to our topic of interest we also read the abstract to subjectively assess if the content should be part of our literature study or not. We also extended our research to the reference lists of related articles. The articles that met our subjective criteria of relevance are presented in the literature review section.

After the comprehensive research we categorized the articles into different topics: the difference to auditing as well as fraud examinations; the role of forensic accountants; qualities and characteristics of forensic accountants; preventive & detective methods; the cultural context

and, finally, education. Our literature review will be organized according to these categories. Additionally, the last section of our literature review will assess the research that specifically addressed forensic accounting curriculums and upon that insight we formulate a categorization framework that builds on both the previous research findings and our data about forensic accounting education.

### 2.3.2 Method for Data Collection

The data in this study will be collected through documentation research. This collected documentation is composed of the forensic accounting curriculums from the universities, and job advertisements for forensic accountants from companies.

From the curriculums and study descriptions we derive the forensic accounting courses that are currently taught as part of forensic accounting degrees at universities in the US, UK, Australia and China. For each individual degree, we assess the course title and description and consequently categorize the course into one of the following four categories: 'Basic Accounting Knowledge' (BAK; likewise referred to as Basic knowledge); 'Forensic Accounting Knowledge' (FAK); 'Technical Skills' (TS) and 'Other Important Skills' (OIS). While the BAK category resembles the traditional accounting knowledge that should be part of any degree, the remaining three categories resemble the forensic accountant's distinct knowledge areas and skills. A more elaborate explanation of the categories will follow in the end of the literature review, since these categories were formulated based on the literature review and the composition of the curriculums in our sample. After we collected the data and information we needed from the curriculums, we created a form that lists the forensic accounting curriculums in universities around the world. We then utilized this form to find the commonalities and the differences among the degrees which we could then compare to previous findings to decide on suitable categorizations for the various courses.

A suitable alternative approach to our documentation research of curriculums would be to do interviews with educators, professors, academics or recent graduates, who have just started working as forensic accountants. These interviews would give us an insight on how they view the current educational field. Especially the insight of the recent graduates could be exceptionally useful as they should know best to what extent their forensic accounting degree has prepared them for the job. Nevertheless, we did not conduct any interviews. Firstly, the small number of studies that has been conducted in the educational field of forensic accounting have mostly used surveys and interviews, hence, our approach would then be very similar. Secondly, we consider the interview approach much more suitable if conducted locally. The

comparison of the educational aspects and investigation of contextual differences between countries would, however, require us to find and reach out to people in several countries. Thirdly, the time constraint makes this whole approach even more challenging to navigate, as after all, we would depend on the response of strangers. In general, our type of documentation research will allow us to independently collect more data in a shorter period.

In a similar fashion to the data collection of curriculums, we likewise use the job advertisements to identify the employer's requirements for a forensic accountant. To enable an easier comparison, we categorize the attributes and characteristics that are required in the job ads according to the same framework as the curriculums. The various attributes, which we found, and their assigned category will be more elaborately discussed in the findings section of the job advertisements.

Compared to alternative approaches to examine the professional requirements for forensic accountants, such as interviews and surveys, we likewise consider online job advertisements as a more applicable data source. On the one hand, it is the easiest method to obtain a broader data set which we consider more representative of the market situation than a much smaller sample of interviews. On the other, these job advertisements most effectively mirror the current labour market situation for forensic accountants as we believe that it represents the modern practice of finding and hiring for jobs. Furthermore, we have not found a single study in the field of forensic accounting that has investigated the various job advertisements posted by forensic accountant employers. Instead, researchers have, in the same manner as for curriculums, focused on interviews and surveys with professional, academics and professors (McMullan & Sanchez, 2010; Davis, Farrell & Ogilby, 2013; Rezaee, Ha & Lo, 2014). Hence, our research method will provide a new perspective on the professional requirements of forensic accountants.

### 2.3.3 Method for Data Analysis

For our data analysis we use the method of comparison. From the curriculum data collection, we have the degrees' courses listed according to their categorization. As a result, we can calculate ratios and see how much importance, based on the average number of courses, the universities attach to the four different categories. These ratios are then in turn subdivided into the four countries of our sample as well as into bachelor and master degrees, to enable a more thorough analysis and understanding of the curriculum compositions. Overall, these outcomes

highlight what additional knowledge and skills the forensic accounting degrees provide and how these differ across countries and degree types.

Since, our intention is to investigate how these degree unique courses help to close the potential gap in forensic accounting education, we must analyse the content of the curriculums in the light of the professional demands, too. Therefore, we calculate the percentage ratios of the four categories, mentioned in the ads, based on the occurrence or non-occurrence of each individual attribute, of the category. Consequently, we can observe and visualize in how many advertisements the individual attributes, and hence the four categories, are on average required or desired. With these results, we know which categories and individual attributes are the most requested by individual employers. Hence, we are able to analyse if the forensic accounting education offered by universities is actually demanded by current employers and if the curriculums do not provide enough courses for any of the four categories. Correspondingly, we will compare these results with findings from previous research.

## **2.4 Sources of Data**

Regarding the initial selection of countries, we use our subjective assessment dependent on our experience, opinion, estimated amount of demand for forensic accountants and the approximate number of educational degrees. Our final data collection was sourced from the US, UK, China and Australia.

For our data collection of curriculums, we started in China. Since we were interested in the best representations of forensic accounting education, we initially searched for bachelor and master degrees at the top ten law and accounting schools in China. The individual courses of the various curriculums were sorted into the four categories BAK, FAK, TS and OIS. Once we attempted to utilize the same 'top ten' strategy in the US, we realized that apart from China, it is rather uncommon that the most famous universities offer forensic accounting courses. Therefore, we used bachelor and master degree databases to identify the remaining curriculums from US, UK and Australia for our sample. Additionally, it should be noted, that not all degrees bear the label 'forensic accounting', although this was naturally our key term for the search. Instead they have synonym terminologies such as "M.S. in Criminal Justice", "Economic Crime Investigation", "Master of Fraud and Financial Crime".

If we would investigate more demanded jobs than forensic accountant positions, we could search on the individual websites of large international companies. However, as there is already only a limited amount of jobs offered in this growing field, it easier and quicker to use a job portal. To find the job advertisement for forensic accountants we decided to utilize the meta



search engine 'indeed.com' to search for 'forensic accountant' jobs. This search portal is one of the largest job engines in the world and provided sufficient job notices for forensic accountants in the US, UK, Australia and China. The only problem with the use of indeed.com or other search engines is that one can occasionally find duplicates or highly similar job advertisements. Since we cannot rely on our memory to identify these misleading findings, we additionally conducted a cross check of the web links to the job advertisements to eliminate any notice that was recorded twice. Furthermore, any ad that was the same apart from the location, as it is the case when a large company searches for a forensic accountant on several websites, it was also omitted. If the job ad is suitable for our purposes, we retrieve the stated job requirements and categorize them in the same manner as the curriculums to simplify a later comparison. The ad collection consisted first of a small sample with 15 company postings. According to this preliminary sample it was possible to identify commonalities that could be summarized into categories that followed both the previous theory reviewed as well as the findings and categorization of the curriculum data. This in turn enables a subsequent analysis of the curriculums with the frequency data from the job advertisements.

## **2.5 Criteria for the Research**

This section is split into the 'reliability' and 'validity' criteria.

### **2.5.1 Reliability**

Bryman and Bell (2011) refer to 'reliability' as the repeatability of the research results. On the one hand, our research is based on the literature review. The literature we present is mainly from well-known published journals, including some top journals in the accounting and auditing field, such as Accounting Horizons, Accounting Review, Harvard Business Review, International Journal of Accounting, International Journal of Auditing, Journal of Accounting and Economics and Journal of Accounting Research etc. Hence, our theoretical background should form a good basis for a reliable study

On the other hand, our results are based on curriculums from various universities around the world and the recruitment needs posted by dozens of employers, which makes our results more reliable since it considers a great variety of educational offers and recruitment demands.

### **2.5.2 Validity**

Two of the main types of validity presented by Bryman and Bell (2011), which are reflected in our study, are 'internal validity' and 'external validity'.

Internal validity has a parallel concept proposed by Lincoln and Guba (1985) called 'credibility'. It refers to the acceptability of the research results to others. Our data is publicly available information from universities' websites and companies' websites, which makes our results easy to access and examine.

Lincoln and Guba (1985) also present a parallel concept for external validity named 'transferability', which indicates that the results of the study could be widely applied to various contexts. This means that our findings should also be applicable to other contexts, in this case, at different universities in other countries. Our reviewed literatures from well-known journals and data collection from universities around the world, provide in our opinion adequate information about the phenomenon and circumstances of current curriculums in forensic accounting. Although, our findings could differ in other countries, as the context changes, it still provides a more transferable result than many other studies in the field of forensic accounting as we conduct a cross-country study compared to, the more popular approach of, data collection from only one country.

## **2.6 Method Limitations**

Although, we consider our approach the most suitable method regarding our purpose, we identified and encountered two potential problems. On the one hand, there is only a limited and small number of job advertisement available, since the overall demand is much lower than for more traditional jobs such as accountants, auditors and controllers. On the other hand, our data collection is affected to some degree by our subjectivity.

### Limited amount of job advertisements

The final sample size of 91 ads is considerably lower than initially anticipated as indeed.com presented above 300 matches for the US and 150 matches in the UK on the 2nd of May. Nevertheless, most of these ads and some data from these ads were omitted from our sample due to the following reasons:

(1) *Not a Forensic Accounting job* - Some positions are simply shown because the word forensic is used in the description. However, often the company utilizes the limitless amount of space, as it is online, for their advertisements to present a lot information about its various departments, which includes a forensic division. Hence, these jobs show up but have little or nothing to do with the tasks of a forensic accountant. (See Appendix B for a list of all included job names and labels)

(2) *Not sufficient data* - Even though the employers have usually the ability to make the description as long as one desires, some of the job notices offer little more information than the minimum degree in Accounting or Finance in addition to a minimum amount of years' experience in the field of forensic accounting. As this information does not support our analysis of curriculums, as it focuses on the required skills, we have omitted these postings.

(3) *Too generic attributes* - While some attributes, such as oral and written communication skills, organizational abilities and leadership proficiency, were mentioned most of the time, they hardly represent unique attributes that are distinctly different from that of accountants or auditors. Even though we understand their importance, these characteristics are omitted from the actual analysis as they are too general to categorize them into our predefined educational categories of the curriculum's courses. Instead, as we clarify in the discussion, these skills should simply be part of the taught courses rather than the focus of the curriculum.

## Subjectivity

During several steps of the research method there is a potential of subjective influences. For example, what should be considered to be an insufficient amount of information in an ad and, hence, when should it be omitted. However, as we have defined the applicable key words for the job search and categorization of attributes, we have tried to limit this subjective bias (See Appendix A for the list of key terms used for attribute data collection). Subsequently, there is no distinction between desired and required attributes as the difference is often subject to judgement or not even stated. Therefore, all attributes were considered to be simply desired and the more attributes a potential candidate can offer, the better are the chances of being hired. Additionally, it should be noted that we have not made a differentiation between the various job levels, such as junior or senior. Most advertisements do not display these labels and only refer to the years of experience, whilst not specifying if these years of experience refer to the years at university studying a degree, working as a forensic accountant or general work experience in form of internships. Although the experience is one of the essential attributes of forensic accountants, according to Prabowo (2013), the assessment of experience in our case would require our judgement while offering little insight into the educational requirements. Hence, the level of experience and position levels were excluded from our analysis. Considering the curriculums, the main problem regarding our subjective influences was the categorization of the courses as we often had to decide the classification based on the name. However, to lower the risks that we wrongfully assume a different content than the actual content of the course, we read the individual course descriptions and decide together which category would be the

most accurate representation of the course content. Nevertheless, in some cases there was no course description or only a very limited course description available and, thus, the categorization of the individual courses is subjectively based on the limited information.

### **3. Literature Review:**

Forensic accounting is a multidisciplinary field with varying definitions and a great variety of other subjects that are being pursued by researchers. In the following sections, we are going to discuss and clarify the differences of forensic accountants and auditors as well as fraud examiners; further expand on the role of forensic accountants; outline the required qualities and characteristics of the practitioners; present the detective and preventive methods used by the profession; discuss the differences among countries and cultures, review the research about the educational aspects and conclude with the formulation of a framework for our subsequent data collection and analysis that is partially based on the reviewed literature. This literature review is extensive and does arguably not solely include information that is relevant for our analysis. Yet, we believe that for most people the field of forensic accounting is rather unfamiliar and, hence, we think that this information is practical for an improved understanding of our study.

#### **3.1 Difference to Auditing**

As it will become apparent in the literature, a clear majority of forensic accounting research focuses on the topic of fraud. For this reason, many may mistakenly assume that fraud examination is a synonym for forensic accounting. Another false assumption would be that forensic accounting is a part of auditing. This assumption is often made due to following circumstance: if a fraud is detected and taken care of, it will ultimately also lead to a more material and accurate representation of the financial data of a company. In this context, it appears that the responsibility of a forensic accountant is already covered by an auditor. After all, an auditor's responsibility is to "obtain reasonable assurance about whether the financial statements are free of material misstatement, whether caused by error or fraud" (PCAOB AU110, 2017). Hence, an auditor's main goal is to provide an opinion, on the overall financial statements, that is based on reasonable evidence which has been gathered through audit tests and procedures. Correspondingly, during the traditional financial auditing activities, the auditor should keep an open mind for the potential of fraud. As guidance, the Statement on Auditing Standards (SAS) No.82 from 1997 and SAS No.99 from 2002 provide auditors with a checklist of risk factors to consider when making fraud risk assessments. Because of these common auditing practices, it could happen that an auditor discovers a fraud. However, this is only likely if the fraud is detectable within the 'reasonable' auditing approach. The public's misconception that auditors are supposed to detect every potential mistake, and with that also any occurred fraud, is due to the expectation gap. This means that an auditor's service fee does not provide

sufficient funds to finance thorough investigations as the calculated service fee only assumes the necessary amount of work for reasonable assurance and not full assurance which would require a much more detailed analysis. Therefore, auditors are less likely to consider the possibility of fraud after their fraud risk assessments have not led to any concerning findings. Thus, while the auditor might discover concerning evidence or raise the concern about fraudulent behaviour, it is the forensic accountant's responsibility to actually investigate the case. Consequently, the later would begin a forensic investigation once there has been "sufficient predication that a fraud has or may have occurred" (Golden, Skalak & Clayton, 2006, p.20). Appropriately, it is the forensic accountant's duty to gather conclusive facts that may either contest or justify any allegations while the auditor solely collects reasonable assurance to provide credibility to the financial statements (Golden, Skalak & Clayton, 2006). As the forensic accountants regularly work on the request of an attorney, it is their duty to provide evidence beyond a reasonable doubt, just as it is the case for any other crime.

For a simplified clarification the authors, Golden, Skalak & Clayton (2006), provide the analogy of an auditor as a patrolman and the forensic accountant as a detective. When a patrolman is on duty, he or she checks on the community for any signs of inappropriate behaviour. To select a route for the particular shift, the patrolmen make judgments that are based on their past experiences regarding the community's problematic and important areas. After all, the patrolmen cannot observe every place at once and would possibly also not have sufficient time to visit every area during any one route. In the same manner, auditors, who are responsible to inspect a company for improper financial statements, likewise rely on their judgement to make the best possible use of their paid service time. In contrast to the patrolman, the detective is only on duty if there is a suspicion or evidence of a crime. For the corresponding investigation, the detective utilizes a different set of skills, which are more based on the experience and knowledge about crimes than about the 'community'. Although this analogy may support the simplification that forensic accountants only investigate fraud cases, while they additionally provide litigation support and advisory services, it should clarify the difference in objectives and purposes between the two professions.

Just like the detective, a forensic accountant's knowledge needs to encompass more domains. For example, the distinct investigative practices, such as the forensic accounting interview that has similarities to police interrogations (Singer, 2015), may benefit from a familiarity with the psychology of criminals. Furthermore, the evidence and facts that the forensic accountant

gathers, as part of the investigation, must be useful for a testimony in court and are, hence, subject to a different set of standards than for financial audit evidence that only must reasonably justify an audit opinion. Compared to the financial auditing standards that are established by organisations such as the Securities and Exchange Commission (SEC), the forensic accounting standards develop from courts of law (Gray, 2008). For this reason, the ACFE suggests "education in criminal justice or law enforcement" (ACFE F.A. Career Path, 2017, para. 4) in addition to a degree in the field of accounting or finance. With this supplementary expertise, it can be easier for a forensic accountant to find a job, as possible employees do not only comprise public accounting firms but also law enforcement agencies and government organizations.

Overall, this distinction between the audit profession and forensic accountants should convey, why we believe that traditional auditing courses and degrees do not adequately prepare students for the forensic accounting profession, since the jobs exhibit contrasting responsibilities and with that require different skill sets and knowledge backgrounds.

### **3.2 Difference to Fraud examinations**

With a restricted definition for the forensic accounting profession one may conclude that forensic accountants are basically fraud examiners, whose sole objective is to investigate, prevent and provide testimony in fraud cases. This simplified perspective on the forensic accounting profession, possibly stems from the fact that forensic accountants often use their investigative skills to deal with a vast amount of fraud cases. Although, most know about the famous scandals of Enron and WorldCom, it is much less known what exact effect fraud has on the overall economy, as frauds may remain undiscovered or companies prefer not to report their occurrences. Nevertheless, there are many estimations and investigations on their impact. For example, the Report of the Nations on Occupational Fraud and Abuse by the Association of Certified Fraud Examiners (ACFE), which analysed 2410 cases of occupational fraud in 114 countries, found that the median loss for companies was \$150,000, whilst 23.2 percent of the cases instigated losses above \$1 million (ACFE, 2016). These statistics demonstrate that companies cannot afford to ignore the potential risks of fraud that are inherent in their businesses, especially if one considers that in the worst-case scenario a fraud might even lead to the ruin of the largest corporations.

Potentially for this reason, DiGabriele and Huber (2015) found that among their reviewed forensic accounting literature, 45.1 per cent was concentrated on fraud. Although, fraud is

certainly one if not the largest subject in the forensic accounting domain, it is not the only one. According to Wells (2003), "Forensic accounting work is done by accountants in anticipation of litigation and can include fraud, valuation, bankruptcy and a host of other professional services" (p.1). In contrast, fraud examiners exclusively deal with antifraud matters and their work can also be conducted by non-accountants (Wells, 2003). Hence, a forensic accountant could use the investigative skills needed to act as a fraud examiner in a fraud case, yet this does not constitute the only possible domain of a forensic accountant. In contrast, a fraud examiner could potentially not have the necessary qualifications to work as a forensic accountant.

Since fraud builds one of, if not the main component of a forensic accountant's work, fraud specific jobs are likewise part of our sample. However, we do not include fraud examiner degrees in our curriculum sample as they generally should not aim to provide a well-rounded forensic accounting background but instead only focus on the fraud aspects of the field.

### **3.3 Role of the Forensic Accountant**

One of the research papers that deals with the issue of fraud, examined how the rapid advancements in the information and communications technologies (ICTs) would require proactive approaches to deal with the increased rate of fraud frequency and losses (Simeunovic, Grubor & Ristic, 2016). Consequently, the authors found that the combined use of fraud auditors and digital investigators, whose abilities differ greatly from those of traditional financial auditors, are a beneficial pro-active fraud approach that counteracts the concerning trend of fraud. This has led to an observed shift from a focus on a reactive approach, for example through investigations during the audit process, to a proactive approach, by utilizing adequate controls and an appropriate workplace culture (Nigrini, 2011; Özkul & Pamukçu, 2012). On the one hand, this change can be explained by the findings of the ACFE (2016) as they demonstrate that companies, which use proactive data analytics, would halve the time of frauds from 24 to 12 months as well as lower the median loss by 60%. On the other hand, data shows according to Simeunovic, Grubor & Ristic (2016) that proactive control measures would detect fraud more than twice as often as financial auditors would during their audit procedures. The reduction of the cost caused by fraud is coherent with idea that it is easier and more efficient to stop fraudulent activities in their track as the actual loss is reduced or does not even occur. Nevertheless, as Simeunovic, Grubor & Ristic (2016) argue it appears that the knowledge of financial auditors is not sufficient anymore to ensure a secure internal control system that proactively deals with fraud. The authors claim that this is because the anti-forensic activities



also become more sophisticated which requires constant adaptations by the forensic accounting profession.

If a fraud has already occurred and damages are already irreversible, forensic accountants are likewise indispensable as they are well equipped for conducting thorough investigations, which constitute the reactive approach. Compared to forensic accountants, it can be difficult for traditional accountants to fully comprehend in what sequence the fraud took place and who was involved, especially if a fraud is covered up well and hidden within the organization. Once the forensic accountants have gathered sufficient information they can serve as expert witnesses in court and, hence, improve their client's chance of winning the lawsuit (Ponemon, 1995). While the forensic accountants serve as witnesses, it is not their responsibility to testify whether fraud has occurred or not, but solely to provide evidence for a court's decision (Özkul & Pamukçu, 2012). Moreover, the testimony can be challenged if it is believed that it does not meet certain requirements such as overall reliability and relevance (Ponemon, 1995). In this regard, PricewaterhouseCoopers (2013) found that although many financial expert's, economist's and accountant's testimonies are challenged, less than half are excluded for their lack of reliability or relevance. Thus, it appears that forensic accountant's services can postulate significant value by not only effectively preventing the occurrence of crime but also enabling and supporting the legal procedures for compensation of the concerned company.

Although, forensic accounting appears to provide already significant benefits Huber (2012) notes that it still lacks the necessary standards and regulatory bodies to finally establish forensic accounting as a sole profession. For this reason, the developed countries have already reacted by establishing institutions that provide the presumed essential education that is important for discovering and investigating fraud (Mojsoska & Dujovski, 2015). Colleges and universities have started to integrate forensic accounting into their traditional accounting curriculums that have previously been lacking this critical aspect (Huber, 2012). According to Seda and Kramer (2014), the primary facilitators for this inclusion of forensic accounting topics into the accounting curriculums have been the "corporate fraudulent financial reporting scandals, such as Enron" (p.3). However, Huber (2012) notes that the most essential skills for forensic accountants are developed on the job and, hence, the field's certifications also require sufficient amounts of practice. As more forensic accountants are utilized by agencies of the government and the private sector, it is likely that the financial reporting efforts improve in faithfulness, relevance and understandability as it has been found by Lucy, Okoh, Nnaemka (2016).

Comparably to Huber (2012), the authors likewise indicate that the profession is still lacking an appropriate oversight from an accounting body. In this regard, Lucy, Okoh and Nnaemka (2016) even recommend that the Nigerian government should make the forensic accountant's audits compulsive for companies as this could lead to overall improvements of financial statements (, 2016). This suggestion would probably also be supported by Nwakoby, Peace and Jane (2016) who found that forensic accounting is an effective tool to combat the financial crimes of the Nigerian banking sector. Nevertheless, to ensure that the forensic accountants can effectively contribute to an improvement in quality assurance of financial reporting, it is advised to first complete a forensic training as the accountants are otherwise not adequately equipped with the necessary skills and knowledge (Lucy, Okoh & Nnaemka, 2016).

With this exploration of the general role of forensic accountants, we intend to emphasize the variety of responsibilities in addition to the fraud element, since these will also reappear in the form of attributes, such as 'interviewing' and 'testimony' skills, in our ad sample. Furthermore, this section should highlight the potential future developments of the field with an establishment of standard and regulatory bodies; an increase in supply of forensic accounting education; possibly the formulation of laws which may make the work of forensic accountants a mandatory service; and as a result, an overall improved economy due to reduced occurrence and effect financial crime.

### **3.4 Qualities and Characteristics of Forensic Accountants**

While the researchers in the field of forensic accounting agree that a forensic accountant's skills and abilities differ greatly from that of an accountant, as they have unlike responsibilities, they still lack a consensus on the most essential attributes. For example, Davis, Farrell and Ogilby (2013) found that while attorneys, CPAs and professors would agree on 'analytical' as the key characteristic, they would disagree on the core skill between the 'oral skills' and the 'forensic ability to simply information'. Nevertheless, all respondents would agree that the possession of relevant credentials would be important, although they would not draw a difference between the new 'Certified in Financial Forensics' (CFF) credential, which is issued by the Association of Certified Public Accountants (for CPAs), or the old 'Certified Fraud Examiner' (CFE) credential.

Other researchers have taken a broader approach. For example, Prabowo (2013) sorted the attributes into 3 broader categories, namely; mentality, method and experience, whilst

investigating the educational requirements for the 'problem-based' competence of a forensic accountant. The experience part is an essential addition as this attribute coincides with Huber's (2012) statement, that the most essential skills are not necessarily developed during the education phase but more likely during the performance of actual forensic accountant activities. These comments about the necessity of practical work would also explain, why most forensic accounting professionals, surveyed by McMullan and Sanchez (2010), recommend interested graduates to first gather work experience in an audit department before applying for a forensic accountant position. However, in addition to that most the survey respondents likewise stated that a bachelor degree would suffice for finding a job in the forensic accounting field. Due to this demand for practical abilities we, therefore, question if forensic accounting degrees, regardless if bachelor or master, can actually provide the prerequisites for a forensic accountant job.

One aspect that researchers and professionals seem to agree about regarding the education for forensic accountants, is that the traditional classroom setting is superior over an online educational program (Davis, Farrell & Ogilby, 2013). As the West Virginia University (2007) concludes in its curriculum analysis, the "hands-on experience is the most effective manner to teach students the required skills" (p.46). Thus, the university would propose to include compulsory forensic accounting internships or other practical activities such as case studies in a university's curriculum. Correspondingly, Van Akkeren, Bucksby and MacKenzie (2013) found that the Australian forensic services firms would likewise require practical skills in addition to the standard accounting qualification that is part of the bachelor or master degree. While the researchers appear to agree on the necessity of work experience or at least practical abilities, McMullen and Sanchez (2010) concluded after surveying 150 fraud and forensic professionals that the highest level of education necessary would only be the bachelor's degree. Thus, for the theoretical background it may not be necessary to acquire a master but it could be crucial to get work experience in a similar profession, for example auditing, as suggested by professionals (McMullan & Sanchez, 2010).

Overall, with this section we want to emphasize that, although there may be a lack of consensus on the required skills, it appears that a minimum education level in the form of a graduate degree is an essential qualification. In addition, the practical skills, such as analytical and problem-solving abilities, which are mostly developed as part of the work experience, are just as

important or even more so, depending on the study. Hence, it is interesting for the investigation of the curriculums, to examine how the practical aspects are integrated into the degree.

### **3.5 Preventive & Detective Methods**

As we have previously found out, there are many similarities between forensic accounting, fraud examination and auditing. This has led to DiGabriele and Huber's (2015) finding that even in the research field of forensic accounting, "forensic accounting is often equated with fraud examination or fraud auditing" (p.100). Thus, some of the papers that are reviewed in this section describe methods that are utilized by auditors during their auditing procedures. Nevertheless, these same methods apply likewise to the forensic accounting profession and are, hence, relevant for this literature review. Current studies about methods of forensic accounting could be classified as methods for detecting fraud and methods for preventing fraud.

#### **3.5.1 Fraud Detection Methods**

To detect fraud, we should first know the reason why an individual or organization commits fraud. SAS No.99 states the symptoms of fraud ('red flags'), which are generally described as the 'fraud triangle'. The fraud triangle presents three conditions when fraud occurs: first, there is an incentive or pressure that provides a reason to commit fraud; second, there is an opportunity for fraud to be perpetrated; third, the individuals committing the fraud possess an attitude that enables them to rationalize the fraud (Hogan et al., 2008). Correspondingly, the fraud triangle could be a useful model for detecting the fraud problems, but Boyle et al. (2015) suggest that the traditional fraud triangle model is incomplete in its specifications and, hence, it could affect auditors' fraud risk judgments in a negative manner. They find that using alternative fraud model practice aids, for example, the fraud diamond model (Wolfe & Hermanson, 2004), which involves the individual 'capability' as the fourth component of the fraud triangle model, can support auditors with improved fraud risk assessments. Additionally, some of the studies indicate that using models, such as logistic regression models, or expert systems have positive impacts on improving auditors' ability to detect fraud and determine appropriate audit procedures (Bell & Carcello, 2000, Eining et al., 1997).

Another method for detecting fraud is the use of questionnaires or checklists provided by some of the auditing standards, such as SAS No. 82 and No. 99. However, studies suggest that the use of questionnaires or checklists is dysfunctional for a fraud case. Pincus (1989) found that the use of red flag questionnaires had no significant impact on fraud risk assessment for the

fraud case by a field experiment on 137 accountants at a large CPA firm. An additional result from his study is that non-questionnaire users show better performance and assess the fraud risk significantly higher than the questionnaire users. Similarly, Asare and Wright's study (2004) suggests that the use of the checklist had little association with the effective diagnosis of the fraud. They also find that auditors with a standard audit program designed a relatively less effective fraud program than those without this tool, but were not more willing to seek consultation with fraud experts. This suggests that standard programs may impair auditors' ability to respond appropriately to fraud risk.

In addition to that, another approach called Benford's Law (Nigrini, 2012) can be applied. Benford's Law is an observation about the frequency distribution of the first digits in many sets of numerical data in real life. The law states that in many naturally occurring data sets, the leading number is likely to be small. Although, Benford's law cannot detect the frauds directly, it can be used as an indicator of accounting and expenses fraud in forensic accounting and auditing fields (Mark Nigrini, 1999; Peshori, 2015).

Unlike most of the methods that are used in current studies, Lee, Churyk, and Clinton (2013) build a qualitative prediction model by using content analysis (CA) to examine narrative disclosures that were evidenced as significant differentiators between fraud and non-fraud firms in annual reports. For the sample, their model could accurately determine between the fraud and non-fraud companies. Thus, the researchers believe that the qualitative prediction model could lead to more accurate results than others model regarding the prediction of fraud.

Lastly, the goal of any anti-fraud program is to prevent fraud, not just to detect it. For that reason, the passage of the Sarbanes-Oxley (SOX) Act of 2002 puts into law tenets intended to prevent fraud. Detection is, however, inevitably tied to prevention, and the two together provide the system of antifraud controls.

### 3.5.2 Fraud Prevention Methods

Compared to the detection of fraud, there is quite a limited number of prevention methods. According to Singleton and Singleton (2010), the successful fraud prevention method needs to look at the organization's culture (corporate governance structure, realistic financial goals, policies and procedures etc.) and try to change it, if necessary. The authors hold the opinion that the first fraud prevention measure that should be considered, is the perception of detection because most of the fraudulent criminals tend to have some specific personal moral principles. For example, the fear of jail, humiliation and loss of family ties is usually a sufficient

discouragement for many potential fraudsters, since they consider the crime not worth its cost. Singleton and Singleton (2010) also list some ways for increasing the perception of detection such as surveillance, anonymous tips and surprise audits etc. In their book, several approaches for preventing fraud are categorized as classic approaches and other measures. The classic approaches include, first, the directive approach, for example by saying "Don't steal. If you do, and we catch you, you'll be fired." (p.178). Second, for the preventive approach there are various means to screen out the potential fraudsters, including background checks for criminal records or credit reports. Another example for the preventive approach is simple internal control. Third, the observation approach expects management to supervise employees' suspicious behaviour or activity and monitor cash or portable inventory in person or by other means, for example a camera. Fourth, the investigative approach is based on investigative results and follows up on discrepancies of inventory, goods, materials, supplies, and product costs etc. Last, the insurance approach requires adequate insurance coverage to cover losses that might occur due to a fraud. Next to the classic approaches, the other measures include the remaining methods: such as background checks, regular audits, internal controls and invigilation. Additionally,, there are evidently other measures and approaches that can be utilized. As suggested by Bierstaker et al. (2006), firewall, virus and password protection, likewise offer suitable protection against crime regardless if the threat is internal or external. Furthermore, the implementation of COSO concepts (Nurhayati, 2016), can likewise be used to both prevent and detect fraud.

Similarly to previous sections, we have included this exploration of the various methods used by forensic accountants, such as the auditing standards on fraud, the internal control and the COSO framework, since they show that certain subjects of traditional accounting curriculums will likewise be useful as part of the forensic accounting degrees. At the same time, this section should illustrate that some of the topics, e.g. the psychological perspective of criminals or the protection against cybercrime, are much less likely to be taught as part of traditional accounting degrees.

### **3.6 Cultural Context**

Since the United States has a long history, it is currently in the world's leading position concerning the field of forensic accounting. For the US, we would believe that forensic accounting has gradually developed into a profession. Although this profession is still arguably small, there is already a great number of employers that require the services of forensic

accountants, including the big four accounting firms, which currently all provide forensic accounting services. Due to this rapid advancement of the field, most forensic accounting publications likewise occurs in the US. For example, the US is host to the world's first forensic accounting professional journal, 'Forensic accounting', which was founded in 2000. Additionally, there are more than 10 kinds of forensic books currently published in the United States, including one of the earlier works, "Fraud Auditing and Forensic Accounting: New Tools and Techniques" (Bologna & Lindquist, 1995), and newer publications such as "Financial Investigation and Forensic Accounting" (Manning, 2010) etc. In view of the already well researched aspects of forensic accounting, some researchers have started to investigate the educational elements (Ramaswamy, 2005; Mc Mullen & Sanchez, 2010) and other related aspects such as certifications (Huber, 2011 & 2012). Based on the advanced position of the United States, the comparison can be made to present the cultural differences of the forensic accounting field in other countries.

In this regard, Australia is a well-fitting example. Here, various institutions collaborate to combat the financial crime activities in unity, hence, these organizations require competent professional. Due to this demand, there are several graduate and postgraduate degrees offered across the country. "As a result of these factors, the amount of loss due to fraud is by far less in Australia than in the USA and UK" (Özkul & Pamukçu, 2012). While the forensic accounting field in Australia is certainly in a good position, we note that these comparisons of overall losses between countries can be misleading since they depend on a variety of factors such as, the state and size of the economy, general culture and tendencies for crime.

The forensic accounting field in the UK likewise bears some differences to other countries. For example, in contrast to the US, the UK values expert witnessing and asset valuation as much less important (Hegazy et al., 2017). The reason for this divergence are with no doubt the distinctive litigation practices and other contrasting practices and regulations. This reflects a different emphasis in the work of a forensic accountant in the UK. Therefore, we would assume that the predominant background and skills of those operating in this field also differ to the US. Whether or not this is the case, any assumption that forensic accounting is the same everywhere, is refuted by the findings of Hegazy et al. (2017) in addition to other, yet limited, existing literature describing the forensic accounting field in jurisdictions other than the US.

In this regard, Nigeria is a less practical example, since it offers similar research to the US regarding the education and training elements at universities (Johnson-Rokosu, 2015) and the public sectors (Okoye & Gbegi 2013). These studies are not only aimed at improving the existing accounting curriculum but also the knowledge and skills of currently practicing forensic accountants as well as auditors. While some of the educational aspects of forensic accounting are potentially more explored in Nigeria than elsewhere, a comparison with most other countries, with a forensic accounting field, becomes problematic due to the different stages in the development of the overall economy.

Compared to the previously mentioned countries, the Japanese forensic accounting field mainly focuses on the topic of system reform as Japan is currently at a different development stage in the field. Japan adopted a forensic accounting system which was influenced heavily, not only by the experiences of UK and the United States, but also by its own social, economic and cultural constraints. This is due to the 'strong government versus weak business' relationship between government and enterprises, which has led to a situation where the independence and impartiality of auditors is weakened by the Japanese traditional cultural identity and fraud manipulations are reinforced by governance (Yin & Xin, 2010).

As for China, in addition to the international research trends, they also apply forensic accounting in their booming digital business world, which is subject of business-to-business fraud in online shopping platforms (Guo & Hu, 2012). Recently, there have similarly been studies that investigated the gap between the accounting practice and the education in China (Rezaee, Ha & Lo, 2014). The results of the researchers' survey, suggested that the forensic accounting field is going to continue with its growth in China and that, hence, more universities would integrate and establish forensic accounting courses.

Considering this section, it is important for us to emphasize how the research field differs because of the contrasting development stages of the forensic accounting field for the reviewed countries. Forensic accounting is a rather new domain and not widely adapted, thus, it is likely that there are similar differences across the curriculums.



### **3.7 Education**

With the exposure of financial scandals in recent years, the awareness of fraud and fraudulent financial reporting is increasing. The success of fraud detection and prevention are based on the professional forensic accounting knowledge, techniques, skills and comprehensive capabilities. Thus, the elements of fraud and forensic accounting education attract more and more attention by the public, especially by educators and practitioners, and as a result the supply in education is increasing (Huber, 2012). However, currently there is a very limited number of universities that provide forensic accounting education as shown by the study of Daniels, Ellis and Gupta (2013), who find that most business schools do not provide a separate course or program in fraud or forensic accounting. However, the survey conducted by Rezaee, Crumbley and Elmore (2004) showed already nine years earlier that educators and practitioners are considering to integrate forensic accounting courses into the traditional accounting curriculum. Therefore, it appears that there is an interest to expand the education supply, yet, most universities prefer either to gradually change the current curriculums or to observe the results at other universities before they offer full forensic accounting degrees

Regarding the gaps in education, Albrecht et al. (2011) present three failures committed by educators which lead to financial statement fraud: first, insufficient ethics training to students; second, lack of knowledge about fraud; third, ineffective teaching methods of accounting education. Additionally, the researchers suggest that educators should focus more extensively on the development of students' analytical skills.

Considering these findings, we believe that the field of forensic accounting is only gradually developing whilst the demand for educated forensic accountants is steadily increasing at a higher rate. Consequently, it is important for us to investigate how the newly established forensic accounting degrees help to close the gap between the educational supply and professional demands.

### **3.8 The Curriculums - Our Framework**

The idea of a primary framework for the analysis of a forensic accounting curriculum, which is used in our study, is based on the following research and our recorded data.

Regarding the general position of curriculums, Seda and Kramer (2014) indicate that there is a lack of consensus between academics and educators. Although, they did not provide conclusive findings on the dissimilarities, their paper highlights that the educational sector appears to be

mirroring the profession's lack in unity. This lack of consistency in curriculums may lead to forensic accountants that are highly educated in one aspect of the field, e.g. fraud examination, but have deficiencies in the remaining areas, such as psychology or law, or lack the necessary practical skill sets. After all, it is difficult to judge which knowledge and skills are the most essential ones for any given tasks.

Most studies on forensic accounting education are confined to professional topics in forensic accounting areas, especially on financial crime, fraud detection and prevention. The National Institute of Justice supported West Virginia University to work on a project that aimed to develop a model educational curriculum in fraud and forensic accounting. In this project, their curriculum consisted of three main areas: “(1) Criminology, legal environment, ethical issues. (2) Fraud prevention, deterrence, detection, investigation, and remediation. (3) Forensic and litigation advisory services, including research and analysis” (West Virginia University, 2007). Similarly, Curtis (2008) emphasizes that criminology, law, legal and regulatory environments and ethics are essential components in forensic accounting curriculums. Rezaee, Crumbley and Elmore's survey (2004) on the essential contents of a forensic accounting curriculum also coincided with the opinions mentioned above, since among 49 topics, “Fundamentals of fraud” and “Financial statement fraud” ranked as the two most important subjects. Therefore, essential attributes of forensic accounting curriculums are, clearly, the forensic accounting specific knowledge courses that focus on fraud, criminology, legal frameworks, even psychology etc. We decided to categorize all these subjects as 'forensic accounting knowledge' (FAK). This category builds the knowledge based forensic accounting category of our framework.

However, as a forensic accountant, it is not enough to have only forensic accounting knowledge. Students need to have comprehensive capabilities to handle the practical work. Although these capabilities have already been investigated, there are not many articles about other knowledge or skills that is required in this area. However, according to McMullen and Sanchez's survey (2010), some areas of forensic accounting which are perceived by the profession as important are: basic accounting skills; level of education/degrees obtain; written communication skills; verbal communication skills; analytical skills; prior audit experience; personality traits; computer forensic skills; background in criminal justice/law enforcement; interviewing skills; experience with Benford's Law; and professional designations. From this study, we find some new elements of forensic accounting education, which are of significant importance for curriculum settings. From the survey's result, we can see that 'basic accounting skills' ranked as the second highest valued attribute. Again, it quite apparent that basic accounting knowledge should be required for anybody who seeks to work as a forensic accountant, since this requires

accounting background and general knowledge about accounting systems. Even more important than the basic accounting knowledge is the 'analytical skill' which is an essential attribute for most forensic accounting activities, e.g. data analysis, forensic investigations, asset tracing, risk assessment etc. Although 'communication skills' might potentially not be that different from other accounting jobs, the professionals suggested that this would still be an important characteristic, since forensic accountant's work is often dependent on a good competence of social interaction.

Another study by DiGabriele (2009) explores the question “what skills are necessary and important to a forensic accountant”. The skills that both academics and practitioners agree to be very important are: deductive analysis, unstructured problem-solving, investigative flexibility, analytical proficiency, communication skills, legal knowledge and composure. The results also include basic knowledge, legal knowledge, analytical skills and communication skills, as they have likewise been highlighted by previous studies.

Overall, we summarized these skills as 'basic accounting knowledge' or simply 'basic knowledge' (BAK), 'technical skills' (TS) and 'other important skills' (OIS). Basic accounting knowledge is the knowledge that everybody needs to acquire before it is possible to learn the actual 'forensic accounting knowledge', since the basic accounting knowledge builds the fundament of forensic accounting. In some cases, the basic knowledge may, however, not be entirely based on an accounting background since forensic accountants can also originate from a law background that is part of forensic accounting degrees at law schools. Nevertheless, it is more common that forensic accountants have, as the name suggests, a basic accounting background. Technical skills include all different analysis tools and computer based skills for among other data processing and data analysis. Other important skills are the skills and characteristics that can reflect one's comprehensive capabilities in different situations, which are important but not necessarily essential for the profession. Examples are the type of skills that are frequently desired, such as communication skills, interviewing skills and some important characteristics such as composure, or a good mental state.

To conclude, we believe that there are four important components that a complete forensic accounting curriculum framework needs to consider: basic accounting knowledge, forensic accounting knowledge, technical skills and other important skills. While the BAK and FAK categories should include all the knowledge based subjects, the TS and OIS categories will incorporate the more practical based skills. Considering the practical skills, it should also be remembered from previous studies that it may be a possibility that for many employers it will

not suffice to have a degree in forensic accounting but in addition they might require practical work experience in a related field (Van Akkeren, Bucksby & MacKenzie, 2013). Therefore, it will be interesting to see to which degree the curriculums are able to provide and teach practice based skills.

## 4. Findings

In the following part, we are first going to discuss the data recorded for the curriculums. Then we will elaborate on the arrangement of the job advertisement data and, afterwards, present those results.

### 4.1 Curriculum Findings

Our sample, organized according to country and type of degree, bachelor and master, is illustrated below in Table 1. In total, we investigated 23 forensic accounting related curriculums. We use the terminology 'related' since not all degrees, which do depict a curriculum focused mainly on forensic accounting courses, is called a 'forensic accounting' degree. From our literature review, we know that the concept of forensic accounting is often mixed with fraud examination and financial crime. For that reason, we have decided during our data collection, to include related degrees, such as "M.S. in Criminal Justice" or "Economic Crime Investigation". As long as the degrees have a forensic accounting based curriculum composition, it is suitable for our analysis. Otherwise our sample would be even smaller without the inclusion of such degrees.

*Table 1: Sample Presentation*

	Number of Bachelor Degrees	Number of Master Degrees
<b>US</b>	3	9
<b>UK</b>	0	5
<b>Australia</b>	0	2
<b>China</b>	2	2
<b>Total</b>	5	18

During the data collection of curriculums in the US, China, Australia and UK, we found that forensic accounting degrees and majors are not only taught in accounting schools or management schools but some of them are offered at law schools such as "China University of Political Science and Law". To a certain extent, these categories lead to different types of curriculums. In accounting school or business school, courses are more focused on accounting, auditing and management control theories and practices. Here, the related law courses only account for a low average percentage of the curriculums. In contrast, law schools emphasize the knowledge of various laws, such as company law, economic law, tax law and bankruptcy law. Correspondingly, the knowledge of accounting, auditing, management control are not considered with great importance.

According to our utilized framework for the forensic accounting curriculum, we categorize all courses which were included in the curriculums into four parts: basic accounting knowledge (BAK), forensic accounting knowledge (FAK), technical skills (TS) and other important skills (OIS).

Our BAK category includes the knowledge of accounting, management, auditing and law, since that is the fundamental knowledge every accountant should acquire. Examples of these courses are: Advanced Accounting Theory; Internal Control and Audit; Primary Financial Management; Economic Law; and Tax Law etc. Basic accounting courses are essential for forensic accounting learning especially in bachelor programs as those students first must understand the various elements of accounting. In master programs, universities prefer courses like 'Risk Management' or 'Corporate Governance', which require more extensive knowledge. However, the preferences for BAK courses may likewise vary between different types of schools. For instance, in accounting school, the basic courses are 'Accounting Theory' or 'Auditing Theory' while in law school the basic courses consist more of law based courses such as Crime Law, Tax Law or Company Law. Regarding the BAK and FAK categories we decided to make an adjustment to our framework and included the ethics courses as part of BAK instead of FAK, although, researchers have suggested that ethics would be an important subject for forensic accountants. While we agree that ethics are indeed essential, we would not suggest that ethics are much less important for traditional accounting professions. Therefore, we believe that ethic courses fit better to the BAK category than FAK category.

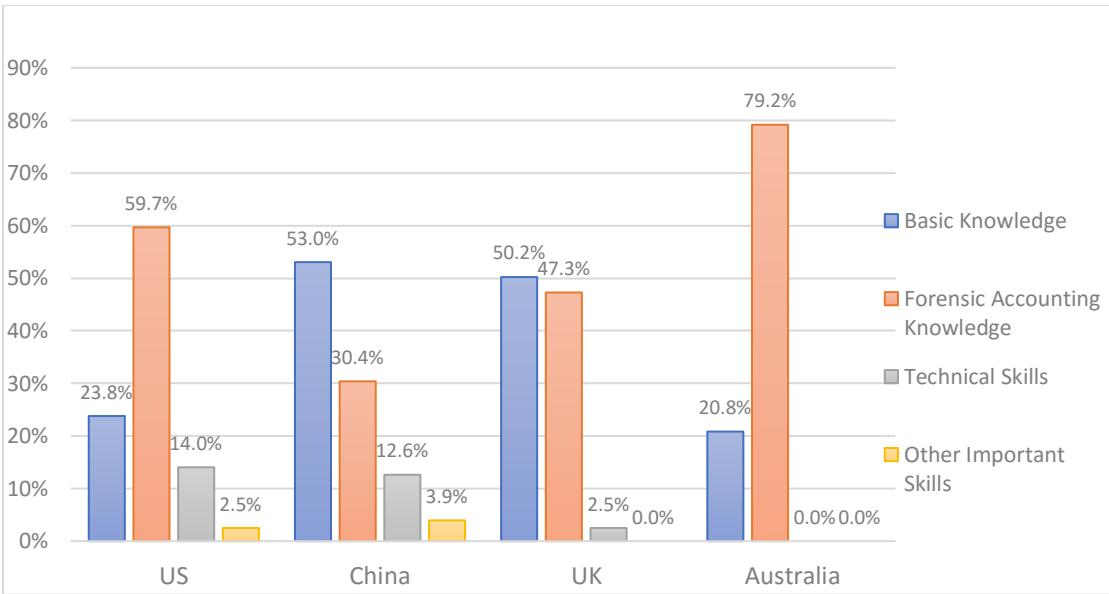
Our FAK category comprises the courses that can specifically be connected to the knowledge requirements of forensic accountants. Thus, these courses are essential for the students who are planning to work as a forensic accountant and who want to distinguish their education towards the forensic accounting field. FAK courses encompass topics such as: Evidence Investigation; Examination Skills; Fraud Investigation; Forensic Auditing; and Forensic Accounting etc. These are naturally the courses that differentiate forensic accounting from other professions. The third category, TS, constitutes mainly all the IT related skills that students need to acquire for dealing with practical cases. Thus, courses included are: Computer Application Foundation; Accounting Information System; Fraud Data Analysis, Data Base Management etc. In general, these technical skills are often used as a tool for data analysis which has become an important part of forensic accountant's work.

The last category, OIS, encompasses the courses that focus on the remaining skills, which are important for professional. These courses are for example: Judicial Writing; Communication; Interviewing and Interrogation; Presentation Techniques; Investigative Psychology etc. Although, some of the skills may not be relevant for every forensic accountant, they can be potentially highly relevant for others. For example the interviewing and interrogation skill will be essential for a forensic investigator but less so for a forensic data analyst.

Our analysis of the curriculums will be concerned with percentage number of courses in each of the four categories. The more courses the universities provide for one category in relation to the other categories, the more important this category is for the university. Thus, if a forensic accounting curriculum provides 80% of its courses in the FAK category, then the curriculum focuses extensively on the forensic accounting specific knowledge (as it should be).

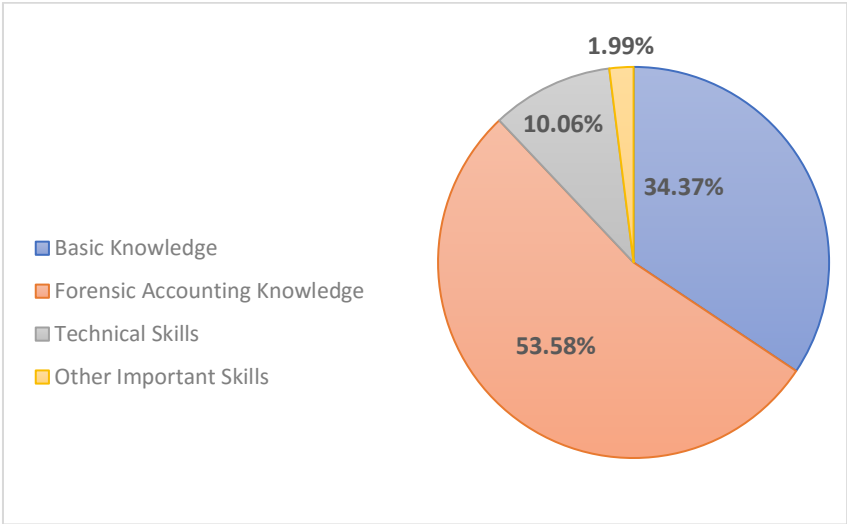
If we compare the overall ratio of the four categories across the four countries, as we can see from Figure 1, the US and Australia focus the most on FAK subjects while China focuses most of its courses around the BAK category. In contrast, the UK follows almost a 50/50 distribution between the two knowledge categories but provides only one practical skill course in the TS category. Compared to the UK, the two master degrees in Australia do not offer any practical skill courses. In contrast, both China and the US provide on average 16.5% skill based courses as part of their curriculums.

*Figure 1: The ratio of courses for each educational category in the US, China, UK and Australia*



The overall average ratios we calculated for each category are shown in Figure 2 below. According to our data, the forensic accounting knowledge accounts for the largest number of courses with an overall contribution of 53% to the curriculums. On second place, the BAK category contributes 34% of the curriculum courses. In contrast to the two knowledge based course categories, the more practical and skill focused courses receive considerable less attention during the composition of the curriculums. For some degrees, there are in fact no TS or OIS courses. Therefore, there is generally a high focus on theoretical teaching and less consideration of practical courses. Nevertheless, we cannot preclude that practical activities are part of the knowledge based courses and, thus, they may be taught part of some of BAK and FAK courses but likely only to a limited extent.

Figure 2: Average ratio of all four educational categories



There are also some differences between the graduate and postgraduate degrees. From our sample we can observe that most of forensic accounting degrees are master or post graduate degrees with 18 out of 23 curriculums. This makes sense, since forensic accounting is a subject that has many basic prerequisites that are usually taught as part of traditional accounting degrees. Hence, a bachelor program has to include the basic knowledge in addition to the other forensic accounting specific courses. Therefore, as we can observe from Figure 3, the bachelor courses focus more extensively on BAK courses with an average composition of 56.97%, and only 22.7% for FAK courses. In contrast, as shown in Figure 4, the master programs intend to provide most courses in the FAK category with 62.16% and include less courses for the basic



knowledge with only 23.09%. Interestingly, the bachelor programs provide generally more practical courses in addition to the knowledge based subjects.

Figure 3: Education category ratios for bachelor degrees

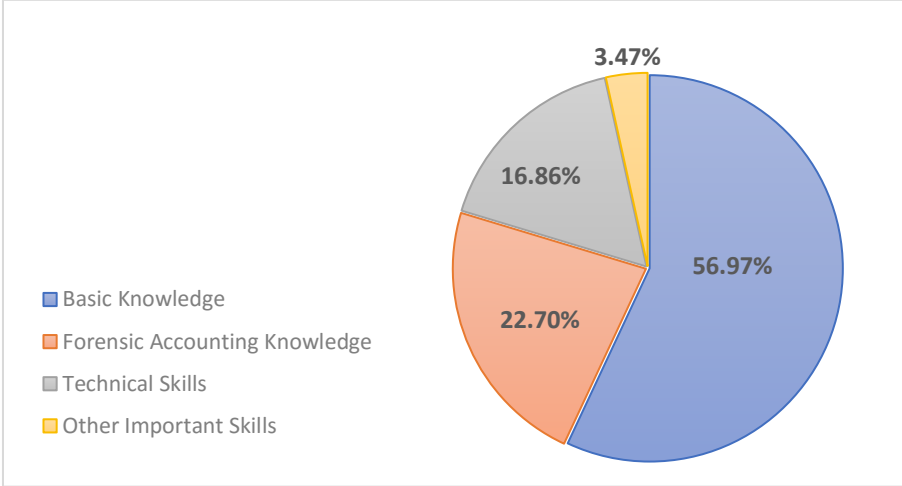
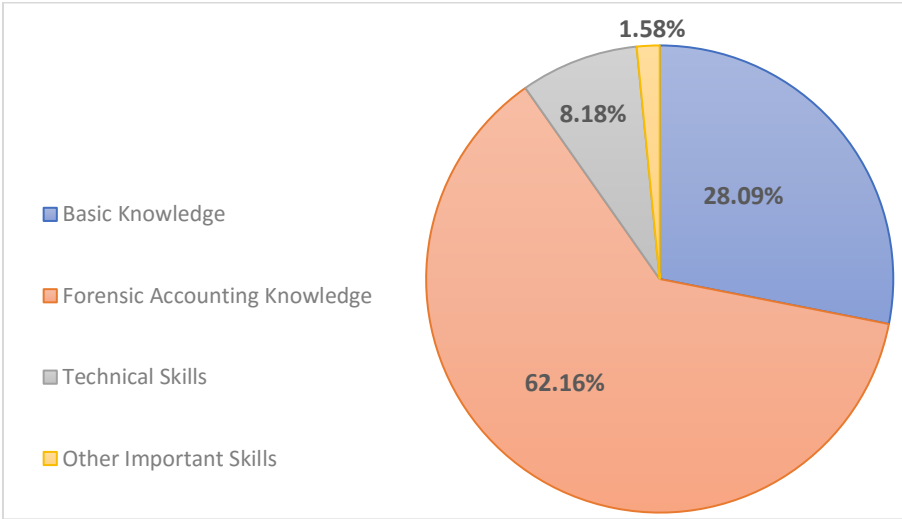


Figure 4: Education category ratios for master degrees



### 4.2 Job Advertisements

Since the US is the most developed market for forensic accountants, it builds the largest portion of our sample with 45 out of 91 unique job advertisements, while the remaining 29 were collected from the UK (19), Australia (14) and China (13).

The 91 unique job opportunities that were recorded for this study were derived from 47 individual companies. Accordingly, 21 jobs were offered by larger companies or institutions that were looking for more than one forensic accountant. For example, PwC was looking for a 'Forensic Accounting Service Manager', an 'Advisory Forensics Manager' and an 'Investigations

Manager'. The remaining 23 jobs did not provide the name of the companies. These advertisements were mainly found in Australia and the UK as many employers from there used recruitment organizations for their hiring process to keep their company name anonymous.

Regarding the general requirements that are not specifically part of the analysis, all but two job ads stated that the minimum level of education should be a university's degree. While many did not make a distinction between the bachelor or master level, most employers, 59 in total, indicated that a bachelor degree would suffice to meet the minimum requirement. In this regard, 'Accounting' was always the first preference, whenever a company specified the required subject area for a degree, which was 45.1% of the time. The other mentioned subjects were: Finance = 31.9% of the time; Business administrations and other business subjects = 22%; Economics = 19.8%; and a law background = 6.6% of the time. The remaining companies solely remarked that a degree would be necessary for the position or that the candidate should be qualified or close to being qualified with a certification. On this subject, a total of 16 different certifications was mentioned. Overall the most frequently desired certification was the CPA (Certified Public Accountant), which occurred in over 50% of all the ads.

Another interesting discovery is that a few of the forensic accountant positions are offered by governmental organizations or other contractors to the government that require a top-level clearance or TS/SCI clearance for the applicants in order to be even considered for the job.

#### 4.2.1 The Framework for the Job Advertisements

For the curriculums, we have identified 4 categories to sort the courses: Basic Knowledge, Forensic Accounting Knowledge, Technical Skills and Other Important Skills. To directly analyse the curriculums with the support of the advertisements, we categorized the requirements found in the job ads in the same manner. However, we decided to leave out the basic knowledge category since all job ads require as a minimum qualification either, a degree in Accounting and related fields, or a general background in accounting which was developed through several years of work experience. Thus, if one would include the basic knowledge category, it would have a 100% frequency and skew the data. After all, the Technical Working Group on Education in Fraud and Forensic Accounting (TWG), which investigates the educational field of forensic accounting, also recognizes that basic accounting knowledge should be considered as a requirement for studying forensic accounting (West Virginia University, 2007). Especially the master degrees for this subject should offer the knowledge and skills which distinguish the forensic accountant from the traditional accountant, rather than advancing the general accounting knowledge.

Considering the attributes that belong to the three remaining categories that are relevant for the job advertisements, we decided on the setting displayed in the table below:

*Table 2: Required attributes recorded from job ads categorized according to the curriculum framework*

Forensic Accounting Knowledge	<ol style="list-style-type: none"> <li>1. Analytical</li> <li>2. Forensic examination skills</li> <li>3. Problem solving</li> </ol>
Technical Skills	<ol style="list-style-type: none"> <li>4. Presentation</li> <li>5. Data analysis</li> <li>6. Database</li> <li>7. Internet Research</li> </ol>
Other Important Skills	<ol style="list-style-type: none"> <li>1. Client management &amp; Sale</li> <li>2. Interpersonal (Team)</li> <li>3. Testimony</li> <li>4. Interviewing</li> </ol>

The individual attributes and the reason for their categorization will be explained in the following paragraphs. The key words that were used for the search of the individual attributes are outlined in Appendix A.

### The Classifications

Forensic Accounting Knowledge:

➤ Analytical

When Albrecht et al. (2009) identified the main problems why traditional accounting education fails to appropriately prepare students for the forensic accounting profession, the lack of analytical skill was mentioned among the three principal issues. This statement is also supported by McMullen and Sanchez's survey (2010) that showed that the analytical skill was the most important skill for the forensic accounting professionals. As analytical abilities are essential attributes for forensic accountants and are part of any forensic investigation, we consider this attribute a component of the forensic accounting knowledge category.

➤ Forensic examination

This attribute refers to the various field related knowledge subjects that are expected to be developed during a forensic accounting degree and that are separate from a traditional accounting degree. As outlined by Prabowo (2013), in his categorization of the crucial attributes, some examples include; evidence collection, investigation methods and fraud detection.

➤ Problem solving

The ability to solve problems has been found to be the third most important skill for a forensic accountant, according to McMullen and Sanchez's survey (2010). In this regard, Prabowo (2013) has described the profession as one with a problem-based nature that requires a puzzle solving mind. Similarly to the analytical attribute, this skill should be taught as part of the forensic accounting knowledge category.

Technical Skills:

➤ Presentation

This attribute refers to the experience with the use of presentation software, such as Microsoft's PowerPoint, as well as the ability to hold a public presentation. The audience for a presentation of a forensic accountant may be the client, the team members, the boss or the court while giving testimony. This skill has been defined as public speaking in McMullen and Sanchez's survey (2010) and ranked with a modest level of importance. Since this attribute is often mentioned as the experience with presentation tools, hence a technical characteristic, we have decided to categorize it as a technical skill.

➤ Data analysis

The experience and knowledge of how to conduct data analyses has been rated as the fourth most important characteristic (McMullen and Sanchez, 2010). Compared to the data assessments of traditional accountants, the data analyses conducted by forensic accountants are likely to follow different purposes and have, thus, a dissimilar focus.

➤ Database

While this attribute stands partly in relation to the previous attribute, database refers essentially to the experience of working with different database systems. For students this knowledge could be developed as part of workshops or internships completed during the degree.

➤ Internet Research

Even though the ability to use internet research tools appears to be a relatively common capacity, it has specifically been mentioned by several ads. Additionally, the experience with

research tools is likely to go beyond common tools, such as google, and, hence, we value it important enough for an inclusion.

#### Other Important Skills

##### ➤ Client management & Sale

Despite this attribute's apparent irrelevance for the forensic accounting profession and lack of previous comments in the research field, this attribute has frequently been mentioned as a desired quality in the recorded ads. This characteristic includes any experience with client management but also includes client negotiation skills and marketing capacities.

##### ➤ Interpersonal

Whereas client management focuses on the communication and interaction with clients, the interpersonal attribute encompasses any sort of communication, regardless if with team members, client's employees, who are potential suspects, and the court. Although this requirement to be part of many social interactions is similar to the audit profession, we consider it still different to the forensic accountant's required skill set. As it is argued by Ramamoorti (2008) "the interpersonal and behavioral dynamics" are often undervalued during fraud prevention and detection efforts.

##### ➤ Testimony

As mentioned in the literature review, it is not unusual for a forensic accountant to be required to give a testimony and provide evidence in court. For this reason, testimonies are part of West Virginia University's model curriculum (2007) and our analysis.

##### ➤ Interviewing

The ability to conduct interviews with potential suspects has been found to be the fifth most important skill, according to the forensic accounting profession (McMullen and Sanchez, 2010). Again, this skill may be comparable to auditor's interviews, yet the forensic accountant's interview or interrogation follows mostly a unlike purpose, especially during an investigation for fraud or other white collar crimes.

#### 4.2.2 The Job Advertisement Findings

First, we investigated how important the three different educational categories are to the employers. This is measured for each individual attribute based on the amount of advertisements that mention the attribute in respect to the candidate's requirements or desired qualifications. Thus, if 50 out of a hundred ads refer to each of the three attributes of forensic accounting knowledge (analytical; forensic examination; problem solving), then 50% of the

positions would require forensic accounting knowledge as it represents the average of its three attributes.

In this regard, Figure 5 shows in how many job advertisements on average, displayed in percentages, the attributes for the three categories were mentioned. As it can be observed from the graph, the forensic accounting knowledge attributes are the most frequently mentioned requirements with an average over just 50%. After that the other important skills category occurs on average in every third ad, while technical skills occur in 27.7% all ads. The detailed composition and individual frequencies of all recorded attributes will be displayed in subsequent figures.

In respect to the FAK category, there is a strong variance between the 3 subcategories as it is displayed in Figure 6. 72.5% of all recorded ads describe the ideal candidate as a highly analytical person. With 20% less than that, the knowledge about forensic examination accounts for 51.6% of all positions. The least required forensic accounting knowledge attribute is the skill of problem solving with a frequency of 35.2%.

*Figure 5: How frequently were the education categories desired?*

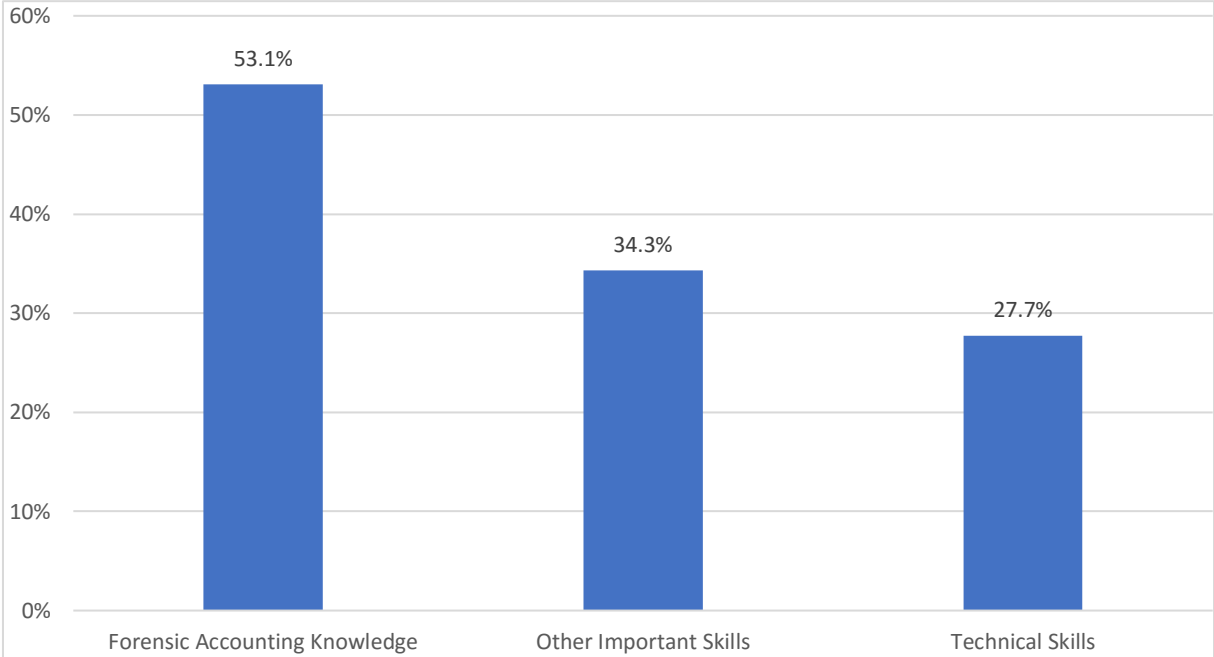
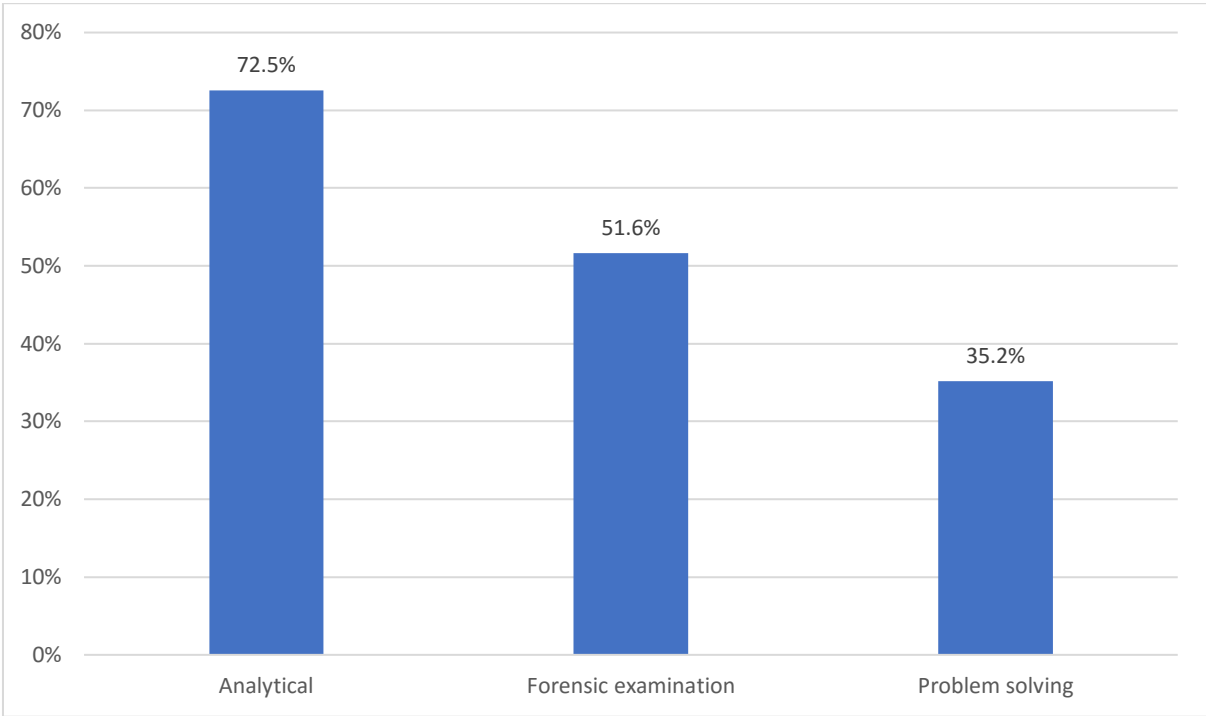


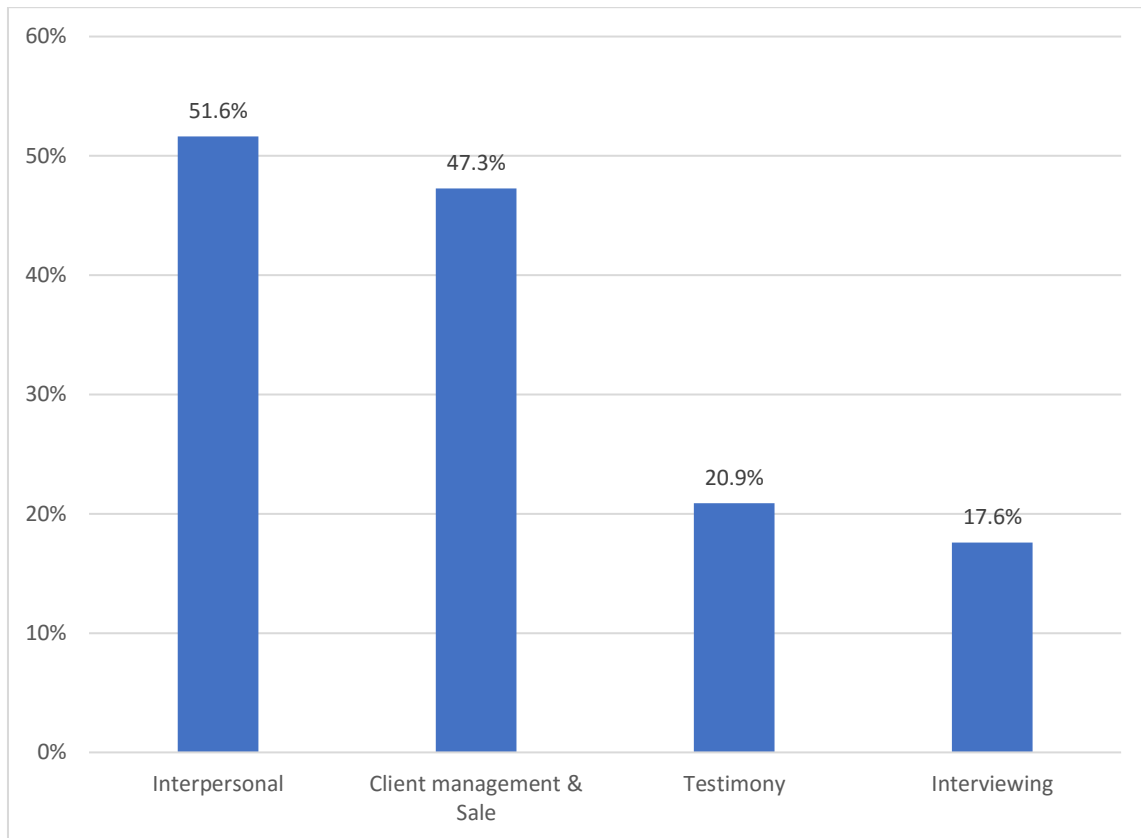
Figure 6: What subcategories of Forensic Accounting Knowledge were the most requested?



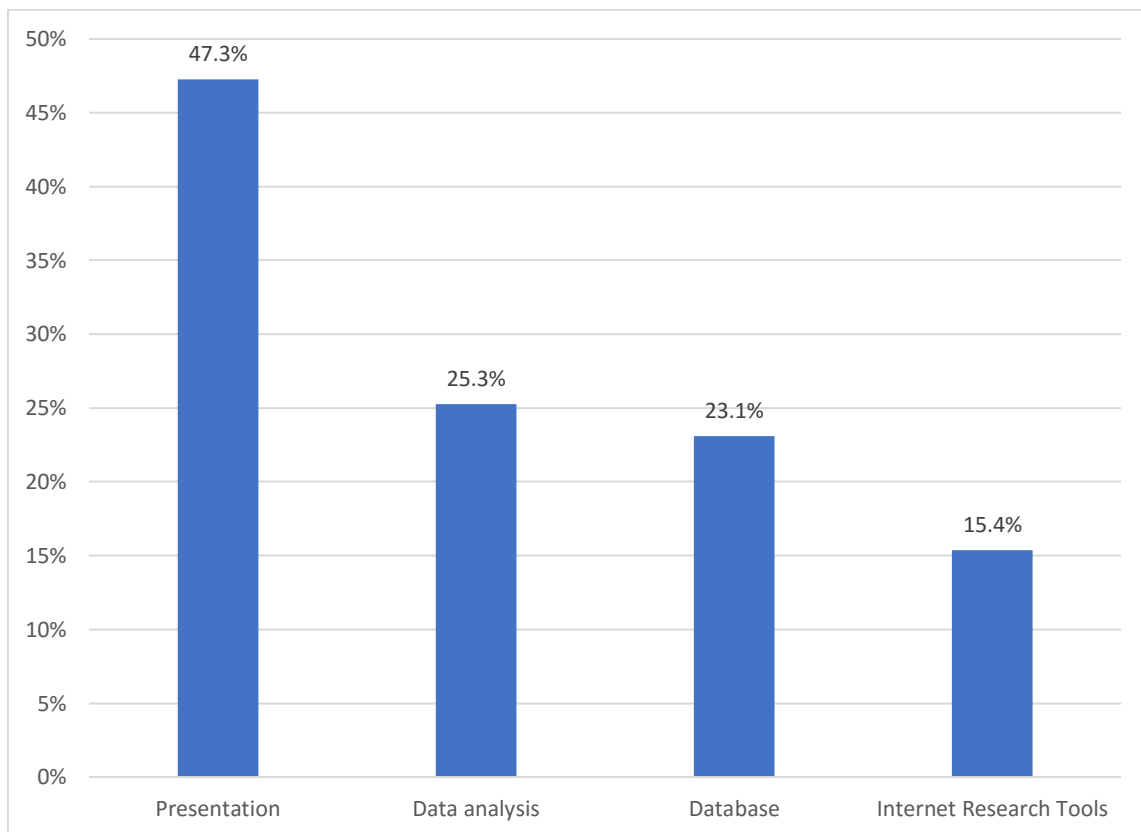
The individual frequencies for the attributes of the other important skills category are displayed in Figure 7. One of the most critical attributes is the ability to deal with and manage clients. A bit more importance is likewise put on interpersonal skills that go beyond the client and include team work and other interpersonal tasks. Additionally, it is interesting to know that a fifth of all advertisements also desired that the applicants would have the necessary knowledge to hold testimonies and present evidence in court. Finally, in 17.6% of the ads, the employers stress that the candidates might have to conduct interviews or interrogations as part of their potential job.

While the technical skill is the least required educational category, as shown in Figure 8, the ability to work with presentation tools and hold presentations is considered to be a valuable skill in almost half of the sample. The other three remaining attributes all rank in-between 25% and 15% with data analysis at 25.3%, database at 23.1% and internet research tools at 15.4%.

*Figure 7: What subcategories of Other Important Skills were the most requested?*



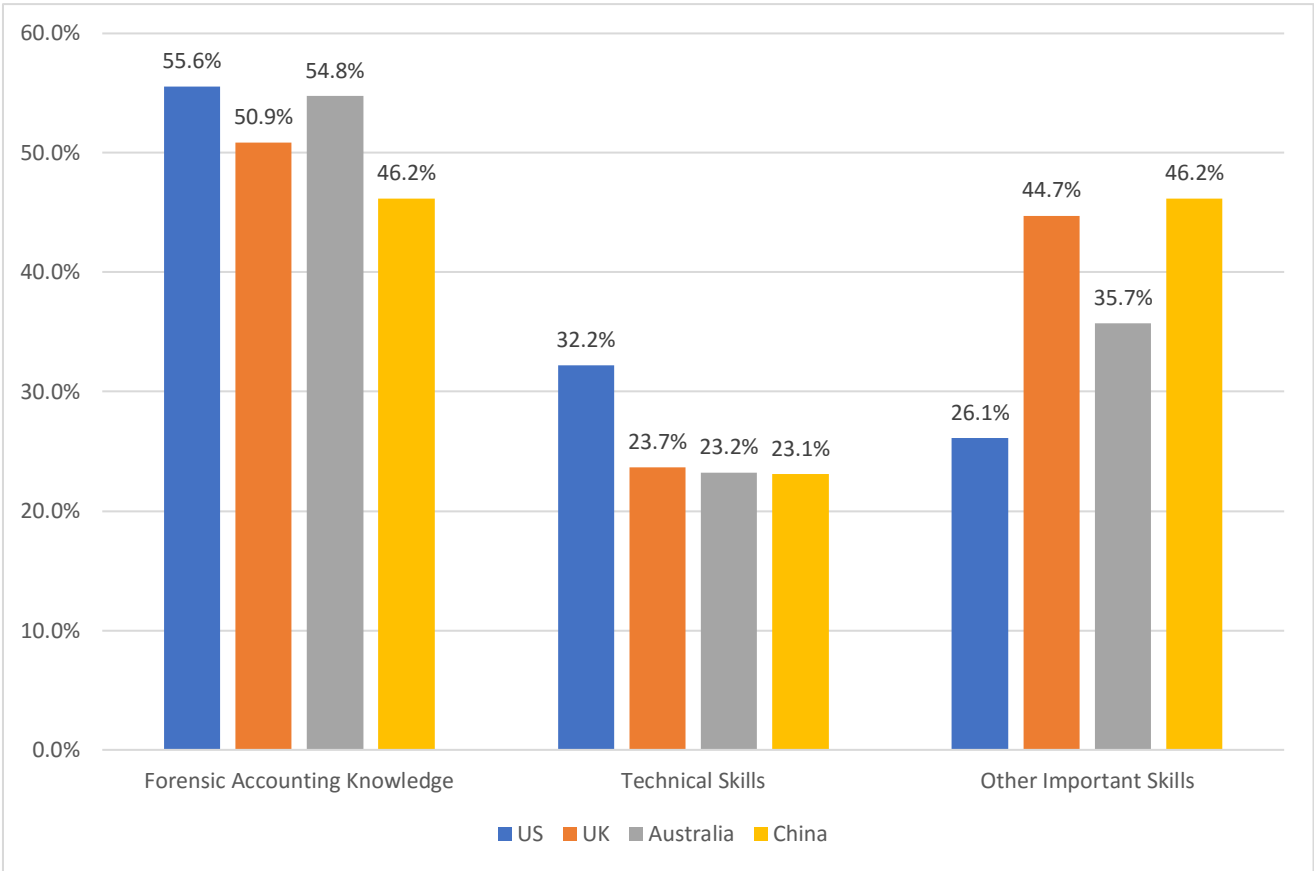
*Figure 8: What subcategories of Technical Skills were the most requested?*





The last figure that is used for the analysis of the curriculums, Figure 9, portrays the overall differences between the four countries of our sample. In our case the amount of advertisements recorded for each of the countries is very limited and arguably not representative of the market. Hence, our interpretation of the data is very restricted. Nonetheless, it is interesting to note that while the US stresses the forensic accounting knowledge as well as the technical skills the most, it also appears to value the other important skills the least.

Figure 9: The differences in frequency between the US, UK, Australia and China



## **5. Discussion**

In general, our findings suggest that there are some adaptations in university's curriculums regarding the findings of previous research in the field of forensic accounting. However, according to the results of our study, which uses the advertised requirements as a benchmark, the curriculums still lack a series of subjects and characteristics that are desired and even demanded by the forensic accountant employers. In the following paragraphs, we will, firstly, discuss how the universities focus extensively on the theoretical aspects of basic accounting knowledge and forensic accounting knowledge while the employers seek high levels of practical attributes in their potential candidates. Secondly, we are going to discuss how the curriculum's compatibilities differ between the studied bachelor and master degrees. Thirdly, we discuss the contextual differences in our findings that among others illustrate the superior curriculum design in the US corresponding to the greatest demand for forensic accountants.

### **5.1 Curriculums vs Job Advertisements**

The problem that education in forensic accounting is too heavily based on theoretical aspects and it would benefit from the inclusion of practical subjects and exercises has already been highlighted by other academics. For that reason, the West Virginia University (2007) proposes activities, such as obligatory internships, workshops and case studies, that provide hands-on experience for the students, since this is the most efficient method to develop the necessary skill set to deploy theory in practice. If students focus extensively on the theory, they may develop an 'inattentional blindness', which may constrain their abilities to think critical and solve problems (Kleinman & Anandarajan, 2011). Since these are among the most essential skills for forensic accountants, it is apparent that experience is a valuable attribute for any forensic accountant. Following this proposition, some required skills are much more likely to be established on the job than during the education phase (Huber 2012). This premise can likewise be derived from McMullen and Sanchez's survey (2010) which found that according to professionals, the best way to become a forensic accountant would be to start in the audit department of a firm rather than to start as a forensic accountant intern or apply directly after the degree to the forensic accounting unit.

However, in contrast to the professional demands for practical skill mentioned in research and our sample of job advertisements, our findings show that there is little focus on the skill categories compared to the basic and forensic accounting knowledge categories. This in turn

suggests that there is a high likelihood for a lack in practical activities and experiences in the degrees.

First, let us compare the overall distribution for the three forensic accounting specific education categories in our curriculum sample with the frequencies from the job advertisements. The results are shown in Table 3. In addition to the previously presented ratios, we have also adjusted the ratios for both the job advertisements and the curriculums to enable an easier comparison. For the adjusted variables, we have excluded the BAK category since this ratio is skewed for the advertisement data. Additionally, we have projected the remaining three ratios for the FAK, TS and OIS categories to be equal to a 100 percent, since this matches the data collection of the curriculums. If the values would not be adjusted, a comparison would be misleading as the percentages for the job ads represent a frequency of being mentioned and not a ratio compared to the remaining categories.

*Table 3: The distribution for the four educational categories compared*

	BAK	FAK	TS	OIS
Curriculums	34.37%	53.58%	10.06%	1.99%
Adjusted Curriculums		81.63%	15.33%	3.03%
Job Ads	100%	53.11%	27.75%	34.34%
Adjusted Job Ads		46.10%	24.09%	29.81%

The comparison between the curriculum data and ad's data show that the attention to technical skill and other important skills during the forensic accounting degrees does not match the professional requirements. Especially if one recognizes that some 'forensic accounting degrees' do not offer a single subject in the skill categories, it can be questioned if the degree instructs the desired attributes of forensic accountants. It is understandable that education at university principally focuses on theory based subjects, the two knowledge categories, as any practical activities are likely to require more resources. For example, it is easier to teach students the theory with a teacher giving lectures and then evaluate the students' progress with a final written exam than to supervise case studies, workshops and group work. Nevertheless, the theoretical approach to forensic accounting is not a problem as the theoretical background is also a

necessity for the work of a forensic accountant. For that reason, the basic accounting knowledge is required in almost every ad by setting an Accounting or related degree as a minimum requirement for an application. The actual problem is just that most universities appear to reject the practical aspects altogether, if we assume that they are not adequately addressed as part of the knowledge based courses.

Unrelated to the job advertisements, our research coincides with the general finding by Rezaee, Crumbley and Elmore (2015) which suggests that there is still no sufficient coverage for forensic accounting education, since we had difficulties to find adequate numbers of suitable forensic accounting degrees. Furthermore, it seems that the proposed lack of consensus in the education field (Seda & Kramer, 2014) is still not resolved, as can be seen in the varying ratios of the curriculums across countries and between type of degrees.

#### 5.1.1 Basic (Accounting) Knowledge

The fact that on average 34.37% of the curriculum courses focus on the basic accounting knowledge, is not a surprising finding. On the one hand, basically all recorded advertisements required such a background in accounting. On the other hand, previous research has likewise suggested that professionals value good accounting competences. For example, Bobbie, Ellis & Gupta (2013) found that 'internal control' and 'ethics', which are both part of the BAK category in our study, were ranked with one of the highest importance values. Similarly, McMullan and Sanchez's survey (2010) found that the basic accounting knowledge is the second most significant attribute. Therefore, the relatively high number of courses in the BAK category do not necessarily mean, that the courses, especially the master degrees which assume basic knowledge as a prerequisite, miss the opportunity to communicate essential qualities for a forensic accountant.

#### 5.1.2 Forensic Accounting Knowledge

Aside from the basic accounting knowledge category, which is often part of the bachelor degree leading up to the forensic accounting master, the forensic accounting knowledge is the most desired attribute by the employers with a recurrence of 46.10%. For that reason, the curriculums consist mostly of FAK courses. While on average, 53.58% of the courses deal with forensic accounting knowledge, the adjusted ratio goes as high as 81.63%. This suggests that the theoretical background for a forensic accountant is likely to be covered by most degrees.

Considering the FAK attributes stated in the job ads, it is still arguable that the two attributes besides forensic examination, **analytical** and **problem solving**, are not actually theory based attributes but more of practical nature. Nevertheless, we still consider them to stand in high correlation with most forensic accounting knowledge subjects (e.g.: Fraud Inspection Method, Site investigation, Financial Forensics and Investigation, Asset Tracing and Recovery, Prosecuting Financial Crime). Compared to other practical attributes that will be discussed in later sections, they are expected to be deeply ingrained in most forensic accounting curriculums. After all, the research by DiGabriele (2009) and McMullen and Sanchez (2010), likewise found that the analytical proficiency as well as problem solving abilities are the most demanded characteristics by professionals. Our findings also confirm this as the analytical attribute was the most mentioned of all recorded skills. With an almost as high as 50% representation in the curriculums, it can be expected that students develop the most essential attributes of a forensic accountant in one way or another.

In comparison to the analytical and problem solving skills, **forensic examination** was only 51.6% of the time explicitly addressed. Nonetheless, the assumed target group of the forensic accounting ads has an obvious knowledge and potential practical background in the field of forensic accounting. Due to the broad spectrum of subjects of forensic accounting it is unlikely that our simplified search terms for the data collection captured all referrals accurately. Hence, it is likely that the actual frequency is even higher than 51.6%. Although it is not necessary to mention, the researchers clearly agree that the forensic accounting knowledge subjects with topics concerning criminology, legal environment and fraud are of utmost importance for the educational background (Rezaee, Crumbley & Elmore, 2004; also see West Virginia University, 2007; Curtis, 2008).

### 5.1.3 Other Important Skills

While there is some attention to technical skills with a 10.06% representation (15.33% adjusted) in the curriculums, the OIS category is almost completely neglected, with only 1.99% (3.03%), despite the adjusted average demand of 29.81% for OIS in the job ads. However, like the analytical and problem solving attribute, there is again a chance that the part of the attributes is already represented in other courses. For example, the **interpersonal skill**, with an overall frequency of 51.6% in the ads, could be a component of the knowledge category subjects in the form of group work activities and case studies. Nevertheless, as Ramamoorti (2008) argues, the "interpersonal and behavioral dynamics" are often undervalued regarding fraud prevention and

detection. Hence, it may be practical to integrate courses that specifically address this issue in the form of a course. This is only likely to be the case for Florida Atlantic University's master degree's course "communication".

In contrast to the interpersonal skill, **the client management and sale** category is much less likely a part of the knowledge courses. In addition to that, this attribute is likewise not addressed in any of the skill courses of the curriculums. In this regard, it should be noted that this attribute has previously not been addressed by other researchers. For this reason, it could be that this attribute is not a job specific one but rather an industry or company type specific attribute. Since the service companies, e.g. the big four, that offer forensic accounting services often provide other services as well, they profit from larger clients that are satisfied by the forensic accounting service and, thus, decide to purchase additional services. Consequently, that might also be an argument, why in McMullen and Sanchez's survey (2010) most professionals advised to start in the audit department of the company. This audit experience would offer practical experience with client interactions which then in turn would later be useful when applying for a forensic accounting position. Whilst our finding is unlikely to suffice to justify an individual course, it could prove practical to integrate client management with the interpersonal attribute and potentially also some of the other skills that were not part of our analysis but mentioned by other researchers, such as oral and written communication or reporting (McMullan & Sanchez, 2010).

The last two attributes of OIS, **testimony** and **interviewing**, are likewise part of the social interaction field, yet much more specific. Whereas their representation in the job advertisements was considerably lower than the previous two attributes, with 20.9% for testimony and 17.6% for interviewing, they are, nevertheless, distinctive for the profession. Especially students, who consider a specific job which requires investigative interviewing skills or frequent court testimonies, would benefit if these two subjects are offered as voluntary courses. After all, interviewing skills was considered the fifth most important attribute by the professionals questioned in McMullen and Sanchez's survey (2010). This consideration has apparently been made by West Virginia University which includes "interviewing and interrogation" as a subject in its curriculum. Similarly, testimony is addressed twice as "expert witnesses and dispute resolution" at two other universities. Additionally, it is not certain if testimony is not already part of some law related courses, such as criminal procedure law and prosecuting financial crime.

#### 5.1.4 Technical Skills

In contrast to the OIS, the technical skills received a more reasonable amount attention in the curriculums with an average of 10.06% and 15.33% adjusted. For some degrees, the balance goes even to a 25% composition which matches the 27.75% and adjusted 24.09% representation in the ads. Similarly, to the testimony and interview skills, the **data analysis** and **database** experiences are less required than the presentation capabilities, yet also form an important skill with an almost 20% representation in the ads. These findings by McMullen and Sanchez's survey (2010) likewise suggest the importance of these attributes. While the data analysis and data base courses are not as represented in the curriculums, it is a great sign that some universities have decided to integrate these subjects, for example: Fraud Data Analysis; Advanced Data Mining; Computer Forensic; Science of Systems. In respect to the technical aspects of the degrees it should be noted that McMullen and Sanchez's survey (2010) found that most professionals, 60.4%, considered an undergraduate degree major in "Computer Information Systems" the most appropriate. Additionally, 48% of that sample suggested that computer forensic techniques are a knowledge requirement for forensic accountants. Whilst our findings suggest a lower importance, this weight of importance on technical skills may depend on the type of job of the forensic accountant. For example the importance would vary between somebody who is primarily a data analyst and somebody who works as an investigator with a focus on social interactions. Thus, in the same manner as interviewing skills may be more practical as voluntary subjects, in case the degree length is restricted as it is the case for a master degree, it could be beneficial to offer some of the technology based courses as voluntary subjects.

Comparable to the client management attribute, the **internet research skill** has also hardly been mentioned in previous literature, however, this skill is clearly more integrated in other courses, since the students are required to research information about businesses, markets, literature etc. If it is not otherwise stated, one can assume that it should be sufficient to have used the internet for research purposes during various assignments and university activities. In case there are certain search tools that are unique to the profession and, thus, experience in these is advisable for students, then these tools could be integrated into the current curriculums. A possible example of these unique search tools could be governmental databases and systems since these organizations frequently employ and need forensic accountants. Currently, there are already "research method" courses listed as part of the curriculums. Whilst it can be assumed that these

refer mostly to the research tools required for a dissertation, they could potentially likewise include other important aspects of this skill or could integrate the industry specific tools if necessary.

Similar to the interpersonal and analytical skills, the **presentation** skill is mostly developed as a component of the other courses, for example, in the form of obligatory presentations. Again, this skill is not addressed explicitly in the curriculums but it can be expected that several universities have adopted a more interactive teaching approach which requires presentations by students. Although this skill does not require a separate course, the representation in the ads shows that this skill is in high demand with a 47.3% average frequency.

## **5.2 Type of Degree**

An interesting finding from McMullan and Sanchez's survey (2010) is that most professionals agree that a bachelor suffices, with 58,5% representation, while 38% believe that a master degree is necessary. Clearly, there is still a lack of consensus on the minimum education requirements, yet in our case the results, 59 out of 91 ads, also suggest that a bachelor degree would be sufficient. Nevertheless, in addition to the degree, many companies expect work experience and a set of practical skills. Similar to our findings, the research by Van Akkeren, Bucksby and MacKenzie (2013) likewise suggests, in the case of Australian forensic service firms, that the employers require practical skills in addition to the theoretical aspects that are part of a bachelor or master degree. Hence, one solution would be that both bachelor and master degrees in forensic accounting integrate the development of practical skills, e.g. internships or case studies, in their curriculum. The following analysis is going to consider the differences between the bachelor and master degrees in our sample. The differences in percentage ratios are illustrated in Figure 10.

Additionally, we would like to address the average number of courses for each separate category according to the type of the degree. The results are listed in Table 4. Since the bachelor degrees naturally have a significantly higher number of courses it can be misleading to solely compare the percentage ratios as the number of courses in the bachelor degree may be greater than for the master yet lead to a lower overall percentage ratio.



Figure 10: The ratio of courses: bachelor and master compared

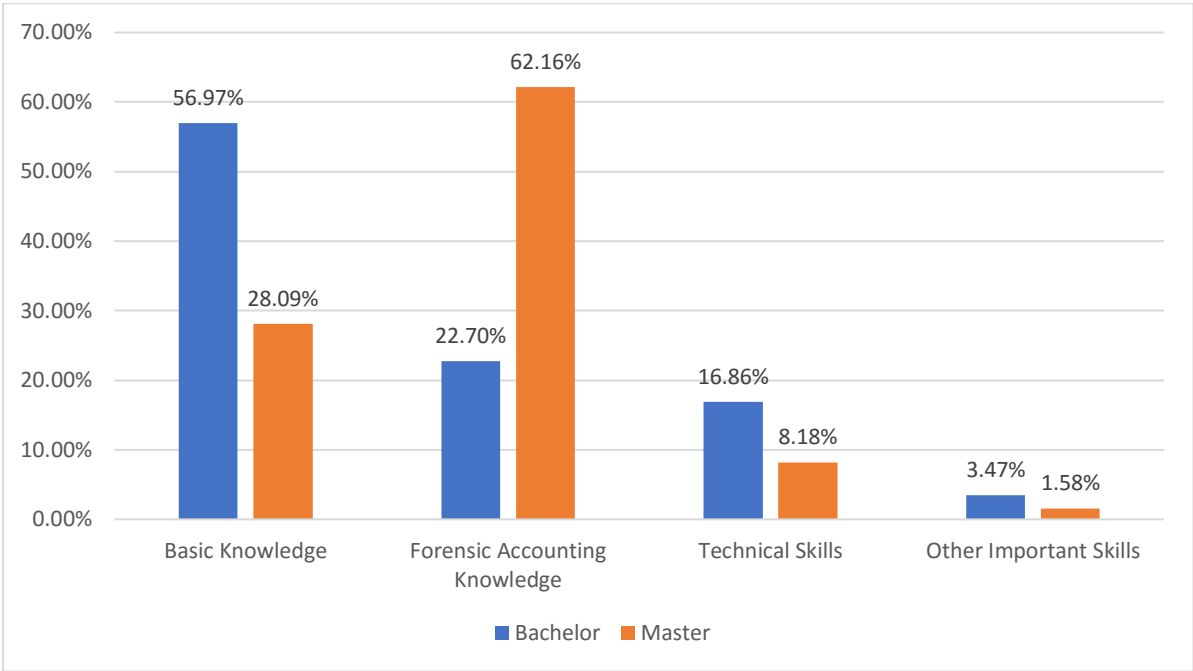


Table 4: Average number of courses for each educational category

	BAK	FAK	TS	OIS
Bachelor Degree	10,40	3,40	3,40	1,00
Master Degree	2,39	4,67	0,78	0,22

Overall, the **bachelor degrees** have a higher focus on basic knowledge with a 56.97% composition and an average of 10,4 courses per curriculum. This is understandable as the students lack the necessary background to start right away with FAK subjects. Nevertheless, the more forensic accounting knowledge the students learn during the bachelor degree, the better are the chances that they find a forensic accounting job. While the 39.46% difference between the bachelor and master focus on FAK subjects suggests that the bachelor curriculums lack sufficient content of forensic accounting knowledge, the average number of courses exposes that they differ by a little bit more than 1 course. Hence, the course contents may suffice as a theoretical background. Considering the practical requirements of the profession, the bachelor curriculums surprisingly appear to offer more practical course content than the master degrees. This is likely to be the result of the expanded time that is available to bachelor degrees which allows educator to include more courses, which in contrast may be considered as non-essential by master degree educators. In case the practical background provided by a bachelor

degree does not suffice, it is according to our findings unlikely that a master degree would fill those educational gap. Thus, it would be more recommendable to find a job, e.g. in audit as suggested by professionals (McMullan & Sanchez, 2010), and gain experience after having finished a forensic accounting bachelor degree.

Compared to the bachelor degree, it is less coherent if the **master degrees** include many basic accounting knowledge courses in the curriculum. Instead the basic accounting knowledge should be expected as a prerequisite to enter a master degree as it is suggested by West Virginia University (2007). Thus, it would be more beneficial if the master degrees focus on the three forensic accounting specific education categories. After all, it can be anticipated that most applicants desire to build on their previous accounting or finance degree and wish to acquire and develop skills that will prepare them for a career in forensic accounting rather than to repeat or slightly expand their basic accounting knowledge. For this reason, it might be better to aim for a similar course ratio than it is implied by the job ads. If there are interested students who do not have the required background, they could simply go to summer school and catch up. This in turn would benefit all the master students committed to the forensic accounting degree. The lower necessity to teach basic accounting knowledge courses and focus more on FAK and skill courses would explain why most forensic accounting degrees are post graduate/master degrees. Our surprising finding that the skill category ratios are even lower for master degrees implies that for the great majority of forensic accounting courses the ratio of TS and OIS courses is even lower than our averages of 10.06% and 1.99% respectively, as there are more master than bachelor degrees. This is rather unexpected since the master degrees should provide the knowledge and skills that are demanded by the profession. While this finding indicates that forensic accounting bachelor degrees may be more beneficial regarding the practical skills, there are also some explanations why these findings are not entirely reliable. On the one hand, there are only five bachelor degrees which are compared to 18 master degrees in our sample. On the other hand, the considerably lower amount of time spent on a master degree only allows for the inclusion of essential subjects, whereas a bachelor curriculum can include practical subjects such as 'Presentation Techniques', 'Professional Writing', 'Communication' and an obligatory internship. Therefore, a master degree may instead integrate the development of practical skills into its knowledge based courses.

Overall, this comparison between the bachelor and master degree suggests, that in order to match the professional requirements, the bachelor programs must adapt the curriculums only

slightly. For example, by lowering the number of basic courses and increasing any of the three forensic accounting categories, preferably the practical skill categories TS and OIS. However, the number of basic accounting courses should also not be too low as the students may otherwise lack the base to understand the FAK subjects. Considering the master degrees, they might not only have to lower the basic accounting courses but eliminate them altogether, if one assumes the already present accounting background from a bachelor degree. Instead, the master degrees could focus on a larger ratio of TS and OIS courses in the curriculum.

### **5.3 Contextual differences**

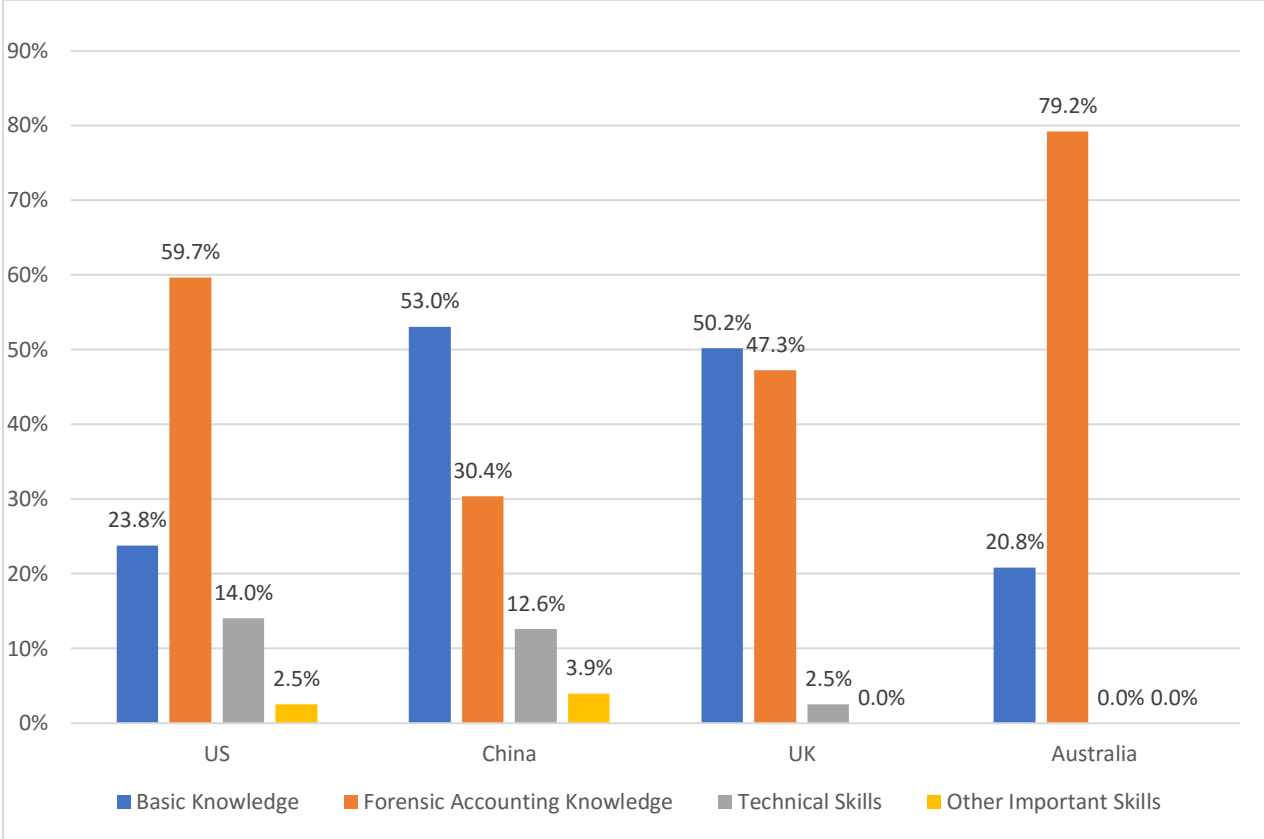
In the light of the country specific differences, there is little research that would support an analysis. This could potentially be the case because there is currently little data about the forensic accounting education and work field to work with. The following analysis is going to analyze these discrepancies.

As it can be observed from Figure 11, there is a clear difference regarding the importance of practical courses between the US and China, which allocate about 15% of their curriculums to these categories, and the UK and Australia, which offer only one TS course as part of the seven different master degrees in our sample. Although the 5 curriculums recorded for the UK are all master degrees, they show about a 50:50 distribution between the BAK and FAK category. As emphasized previously, the basic accounting knowledge should generally not constitute a significant portion of a master degree (West Virginia University, 2007). Compared to the UK, Australia's master degrees focus more extensively on the FAK category with almost 80%, yet also lack the courses in TS and OIS, if one assumes that they are not integrated into the knowledge subjects. In comparison, Chinese universities have adapted many more TS and OIS courses but similarly to the UK still has to strive for more FAK courses compared to BAK to provide the specifications as required by the profession.

In general, the US curriculums appear to be the most advanced and closest to the market requirements as identified from the job ads. While on average they have about the same number of skill courses, they keep the number of courses in the basic accounting knowledge category to a minimum and instead provide substantially more courses in FAK compared to China. Though there is still plenty of room for improvement, considering the 27.75% frequency of TS and 34.34% of OIS skills requirements in the ads. Nevertheless, the category distribution for

the US is certainly the most balanced with plenty of forensic knowledge background and a fair bit of practical courses.

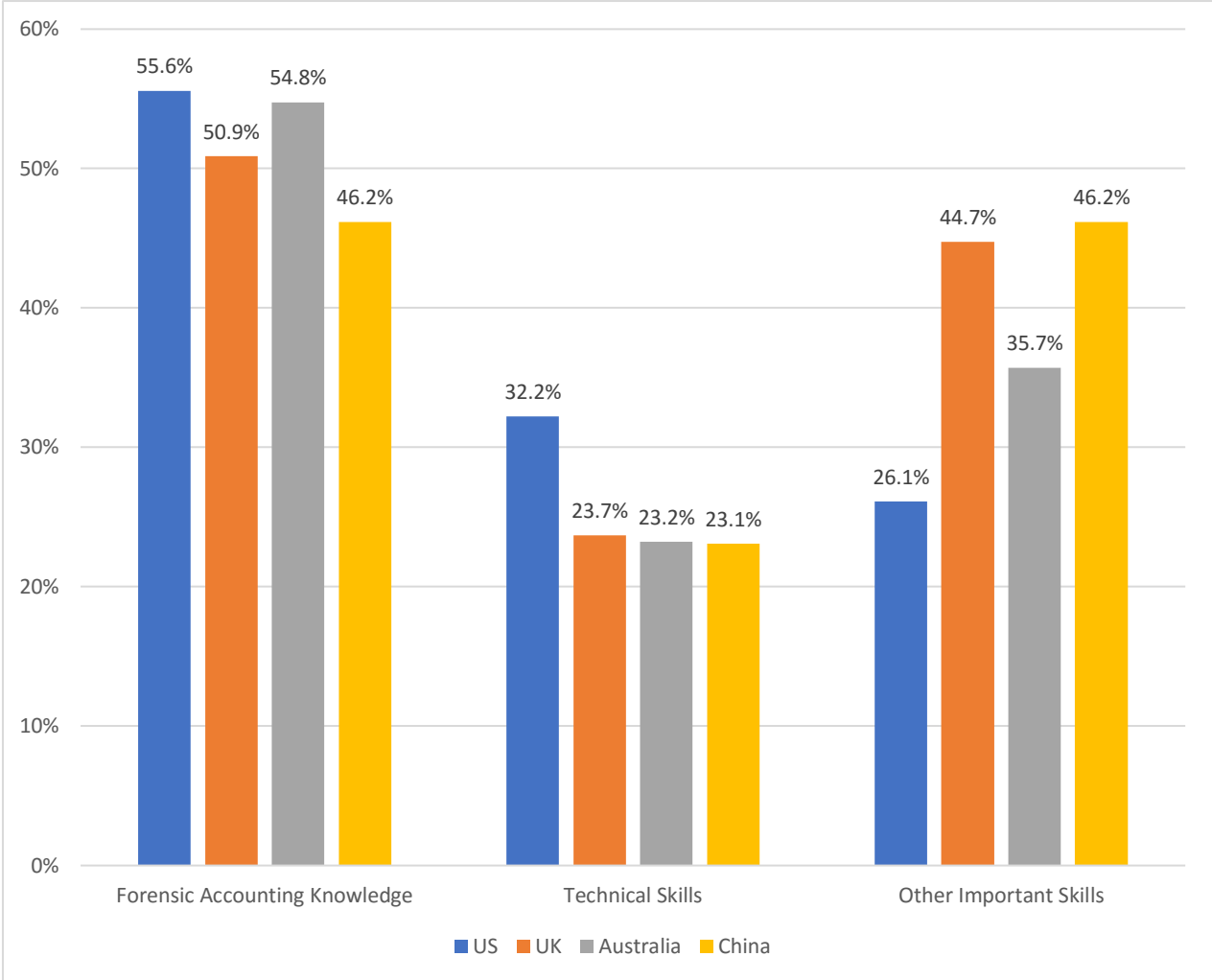
Figure 11: Four knowledge's ratios in the US, China, UK and Australia



In respect to the job advertisements, the differences between the countries are much less apparent. In general, one should note that the available number of suitable ads in the UK, China and Australia was simply too small for a truly representative sample. In contrast, the US has a significantly higher demand for forensic accountants and, hence, this data should be considered more exemplary for the actual market requirements. In general, the data seems to be much more homogenous, compared to the curriculums, as can be seen in Figure 12. All countries' employers demand a high level of FAK attributes and a moderate level of TS attributes. In consideration of the substantial contextual differences, a curious finding is that the US employers require the least amount of OIS. This difference is, however, less the result of differences in interview and testimony abilities but much more of the interpersonal and client management skills demanded both in the UK and China. This is due to the high demand of service companies, such as the big four, for forensic accountants. In contrast, many of the American job advertisements were derived from governmental institutions, such as the FBI, and evidently, they do not work on a client basis, hence, do not require this attribute. The fact

that the US ads represent the highest demand for TS is in turn less surprising, if the US market for forensic accounting is the most advanced, hence, the actual requirements are more clearly defined than in other countries.

Figure 12: The differences in frequency between the US, UK, Australia and China



Regarding our overall result of the curriculum analysis, it appears that the educational field of forensic accounting might present mimetic behaviour, which is the copying of behaviour as standard response to ambiguity, as described in DiMaggio and Powell's (1983) institutional model of isomorphic change. Although there is the potential that the employers likewise just copy each other's job requirements and descriptions as they are themselves uncertain, which would explain the lack of consensus among professionals, the university's curriculums seem to be much more indecisive. While the US and China have included more courses from the skill categories, to adhere to the professional requirements, the UK and Australia occur to have only adjusted their already present accounting curriculums to integrate some FAK subjects.

Nonetheless, to determine for certain to which extent the institutional model of isomorphic change applies, a study over time is required. Additionally, it is probably too early to determine for certain the isomorphic changes as this field is relatively new and may be subject to rapid changes.

## 6. Summary and Conclusion

The field of forensic accounting is a new domain of accounting and, hence, a rather uncharted territory for academics. Since the demand for forensic accountants has been rapidly growing in recent years, due to the inability of the audit profession to prevent corporate scandals caused by fraud, there has likewise been an increasing interest by academics, educators and professionals to provide the necessary education for continued growth of the profession. Although, there has been an expanding body of research about the education, we wonder if the forensic accounting education currently offered by universities provides the knowledge and skills that are desired by the forensic accounting employers. Our scepticism developed from disagreements between researchers and the lack of cross-national studies that would investigate contextual differences. Since the forensic accounting field is beginning to develop around the world, universities will inevitably seek to implement forensic accounting degrees to satisfy the increasing demand for education. Therefore, we aimed to highlight, for universities and academics alike, what type of knowledge and skills the curriculums around the world currently provide and how these potentially differ from the present professional requirements. Appropriately we formulated the following research question:

1. What knowledge and skills do forensic accounting degrees provide and do these, match the attributes that are required by the profession?

- How do these findings differ between graduate and postgraduate degrees?

- How do these findings differ between countries?

Since previous studies have neither compared the current education, offered by educational institutions, with market requirements, or analysed how the compositions of curriculums differ between countries, we decided to develop our own methodology. Nevertheless, some parts of our methods are based on previous research as we considered a mix between an inductive and deductive approach as the most suitable. As a result, we followed a qualitative research strategy for the collection of curriculum data and analysed that considering the job requirement data, which has been collected through a quantitative content analysis.

Regarding our research question, we found that the prerequisites that are demanded by the professionals, according to the job advertisements recorded, are not actually met by the current configurations of bachelor and master curriculums. Although the graduate degrees would on average provide more practical background than the postgraduate degrees, our findings from

the ads suggests that this still does not satisfy the forensic accounting employers. Either the degrees provide too little forensic accounting knowledge, or they offer too few courses that support the development of crucial practical skills, which are categorized as 'technical skill' and 'other important skill' attributes. These findings correspond with the suggestion by professionals that it is recommendable to initially gain work experience in related fields before one applies to a forensic accounting position. An alternative would be for universities to integrate mandatory internships or similarly practice-based activities.

Additionally, we found significant differences between the curriculums, not just regarding the number of degrees offered but also about the category ratios of the curriculums. Overall, the US curriculums matched the job advertisement requirements the most, although the American bachelor and master degrees still lacked both TS and OIS courses. The Chinese curriculums are similarly advanced but provide potentially too many courses from the basic knowledge category. The last two countries, Australia and UK, solely offer a single practical skill course, which evidently does not suffice to meet professional demands. It appears that the Universities from Australia and the UK have solely adjusted their traditional accounting curriculums to include some forensic accounting related subjects. This rather slow and gradual development has also been noted by other researchers.

## **6.1 Theoretical Implications**

Since the academic field of forensic accounting is relatively uncharted, our extensive literature review provides a useful oversight on the current research body. This can be especially practical for anybody who has previously not heard about forensic accounting or is unaware of the academic developments.

Additionally, we have confirmed with previous research that a bachelor degree suffices as a minimum level of education to become a forensic accountant. Nevertheless, we likewise reinforced the notion that practical skills constitute an essential attribute that is usually only acquired through work experience.

Regarding the degree type, we found, that unlike as suggested by West Virginia University (2007), most masters do not necessarily consider the basic accounting knowledge as a prerequisite considering the relatively high number of courses in the basic knowledge category. Furthermore, our basic framework for the categorization of courses and forensic accounting attributes may serve as a starting point for subsequent related analyses.



## **6.2 Practical Implications**

From the employers' perspective, our study might serve as a tool to formulate more fitting requirements in the future since they may have previously lacked the insight into the educational domain of forensic accounting and, thus, not understood the educational background of forensic accounting graduates.

Similarly, from the students' perspective, our study might support the choice of a forensic accounting degree as we highlight the professional requirements and differences among degrees and countries.

Lastly, from the universities' perspective, our findings could likewise help with future creations and configurations of forensic accounting degrees as the ad data suggests potentially more optimal ratios for the courses and their corresponding educational course category.

## **6.3 Future Research**

In general, future research in the field of forensic accounting should pay more consideration to possible contextual differences. Correspondingly, academics should be aware of the rapid development of the field and, hence, how any findings may change or become soon irrelevant. Therefore, we consider it important that more academics focus on the educational sector of forensic accounting since this builds in a way the foundation for future developments of the profession.

Considering our topic, it would be useful to complete a similar study with a broader extent and more data to identify the smaller relationships that we may have sacrificed identifying by applying a broader approach due to our time constraint. As suggested in the alternative approaches section of our methodology, it would, for example, be useful to interview recent forensic accounting graduates who have started their work as forensic accountants.

## **6.4 Limitations**

The greatest limitation of our study is certainly the time constraint which affected our research in several ways. On the one hand, we decided to apply broader categories as part of our framework to include more curriculums and ads in our samples. This in turn has led to less insightful results. On the other hand, we ended up recording less job advertisement than initially anticipated. This is due to the limited amount of job offers, which especially applied in the UK, Australia and China. Thus, it would be possible to collect significantly more ads if it would be possible to check and record the individual entries throughout the year. In this context, time is a significant dependent variable since the supply and type of jobs offered may depend on the

job season, any economic struggles of forensic accounting companies etc. Soon, there may also be many more forensic accounting degrees offered by universities in other countries. In this respect, we were likewise only able to include countries with rather well developed forensic accounting fields due to our data collection methods. If, for example, we would have considered an interview or survey method, it would also have been possible to collect data from much less developed forensic accounting countries. After all, the inclusion of other countries may significantly affect our overall results. In general, our limited amount of data certainly restricts the representativeness of our study.

Furthermore, our data collection was influenced by subjectivity in many aspects, including the formulation of categories, decision on desirable attributes etc. For example, our assessment of the various courses was sometimes solely dependent on the name since a course description was missing.

Lastly, the job advertisements may not be representative of the market demands. On the one hand, there is a chance that duplicates found their way into our sample. On the other hand, there may be interdependencies between specific jobs which also skew the data. Finally, it is unclear who wrote the job advertisement or if the company knows what type of attributes they require. After all, some companies may just copy and paste some of the attributes posted in the ads of their competition.

## 7. Reference List

ACFE (2014) Report of the Nations on Occupational Fraud and Abuse, Association of Certified Fraud Examiners, Retrieved on the 2nd of April from <https://www.acfe.com/rtnn/docs/2014-report-to-nations.pdf>

ACFE (2016) Report of the Nations on Occupational Fraud and Abuse, Association of Certified Fraud Examiners, Retrieved on the 2nd of April from <http://www.acfe.com/rtnn2016/about/executive-summary.aspx>

ACFE F.A. Career Path (2017) Career Paths of a Forensic Accountant. Association of Certified Fraud Examiners. Retrieved on the 10th of April from <http://www.acfe.com/career-path-forensic-accountant.aspx>

Albrecht, W. S., Albrecht, C. O., Albrecht, C. C., & Zimbelman, M. F. (2011). *Fraud examination*. Cengage Learning.

Asare, S. K., & Wright, A. M. (2004). The effectiveness of alternative risk assessment and program planning tools in a fraud setting. *Contemporary Accounting Research*, 21(2), 325-352.

Bell, T. B., & Carcello, J. V. (2000). A decision aid for assessing the likelihood of fraudulent financial reporting. *Auditing: A Journal of Practice & Theory*, 19(1), 169-184.

Bierstaker, J. L., Brody, R. G., & Pacini, C. (2006). Accountants' perceptions regarding fraud detection and prevention methods. *Managerial Auditing Journal*, 21(5), 520-535.

Bryman, A., & Bell, E. (2011). *Business research methods*. Oxford University Press, USA, 3rd edition.

Bologna, J., & Lindquist, R. J. (1995). *Fraud auditing and forensic accounting: new tools and techniques*. John Wiley & Sons Inc.

Boyle, D. M., DeZoort, F. T., & Hermanson, D. R. (2015). The effect of alternative fraud model use on auditors' fraud risk judgments. *Journal of Accounting and Public Policy*, 34(6), 578-596.

Curtis, G. E. (2008). The model curriculum in fraud and forensic accounting and economic crime programs at Utica College. *Issues in Accounting Education*, 23(4), 581-592.

Davis, C., Farrell, R., & Ogilby, S. (2010). Characteristics and skills of the Forensic Accountant. *American Institute of Certified Public Accountants*.

DiGabriele, J. A. (2009). Implications of regulatory prescriptions and audit standards on the evolution of forensic accounting in the audit process. *Journal of Applied Accounting Research*, 10(2), 109-121.

DiGabriele, J. A., & Huber, W. D. (2015). Topics and methods in forensic accounting research. *Accounting Research Journal*, 28(1), 98-114.

- DiMaggio, P., & Powell, W. W. (1983). The iron cage revisited: Collective rationality and institutional isomorphism in organizational fields. *American Sociological Review*, 48(2), 147-160.
- Eining, M. M., Jones, D. R., & Loebbecke, J. K. (1997). Reliance on decision aids: An examination of auditors' assessment of management fraud. *Auditing*, 16(2), 1.
- Fiiia, F. (2013). Forensic accounting: A tool for fraud detection and prevention in the public sector. (A study of selected ministries in Kogi state). *International Journal of Academic Research in Business and social sciences*, 3(3), 1.
- Guo, C., & Hu, X. (2012). Rogue insiders, signature loopholes, and fraud rings: Lessons learned by a Chinese B2B mogul. *International Journal of Accounting & Information Management*, 20(4), 348-362.
- Golden, T. W., Skalak, S. L., Clayton, M. M., & Pill, J. S. (2011). *A guide to forensic accounting investigation*. John Wiley & Sons.
- Gray, D. (2008). Forensic Accounting and Auditing: Compared and Contrasted to Traditional Accounting and Auditing. *American Journal of business education*, 1(2), 115-126.
- Hegazy, S., Sangster, A., & Kotb, A. (2017). Mapping Forensic Accounting in the UK. *Journal of International Accounting, Auditing and Taxation*.
- Hoffman, V. B., & Zimbelman, M. F. (2009). Do strategic reasoning and brainstorming help auditors change their standard audit procedures in response to fraud risk?. *The Accounting Review*, 84(3), 811-837.
- Hollie, D., Nicholls, C., & Yu, S. C. (2011). A Forensic Accounting Examination of Financial Reporting Fraud at the Segment Level.
- Huber, W.D. (2012) Is Forensic Accounting in the United States Becoming a Profession?, *Journal of Forensic & Investigative Accounting*, Vol. 4, No. 1
- Huber, W.D. (2013), "Should the forensic accounting profession be regulated?", *Research in Accounting Regulation*, Vol. 25, pp. 123-132.
- Huber, W.D. and DiGabriele, J.A. (2014), "Research in forensic accounting – what matters?", *Journal of Theoretical Accounting Research*, Vol. 10 No. 1.
- Hogan, C. E., Rezaee, Z., Riley Jr, R. A., & Velury, U. K. (2008). Financial statement fraud: Insights from the academic literature. *Auditing: A Journal of Practice & Theory*, 27(2), 231-252.
- Johnson-Rokosu, S. F. (2015). Integrating forensic accounting core competency into the study of accounting. Case of Nigeria tertiary institutions. *Academic Journal of Economic Studies*, 1(3), 38-64.
- Kleinman, G., & Anandarajan, A. (2011). Inattentional blindness and its relevance to teaching forensic accounting and auditing. *Journal of Accounting Education*, 29(1), 37-49.

Lee, C. C., Churyk, N. T., & Clinton, B. D. (2013). Validating Early Fraud Prediction Using Narrative Disclosures. *Journal of Forensic & Investigative Accounting*, 5(1), 35-57.

Lincoln, YS. & Guba, EG. (1985). *Naturalistic Inquiry* (Vol.75). Newbury Park, CA: Sage Publications

Lucy, Okoh, Nnaemka (2016) Does Forensic Accounting enhance Quality of Financial Reporting in Nigeria?: *An Empirical, Eurpoean Journal of Accounting, Auditing and Finance Research*, Vol. 4, No. 8

Manning, G. A., & CFE, E. (2010). *Financial investigation and forensic accounting*. CRC Press.

McMullen, D. A., & Sanchez, M. H. (2010). A preliminary investigation of the necessary skills, education requirements, and training requirements for forensic accountants. *Journal of Forensic & Investigative Accounting*, 2(2), 30-48.

Mojsoska, S. and Dujovski, N. (2015) Recognizing of forensic accounting and forensic audit in the SouthEastern European countries, *Journal of Eastern-European Criminal Law*, No. 2

Nigrini M., J. (1999). I've got your number: How a mathematical phenomenon can help CPAs uncover fraud and other irregularities. *Journal of Accountancy*, 187(5).

Nigrini, M. (2011). *Forensic analytics: methods and techniques for forensic accounting investigations* (Vol. 558). John Wiley & Sons.

Nigrini, M. (2012). *Benford's Law: Applications for forensic accounting, auditing, and fraud detection* (Vol. 586). John Wiley & Sons.

Nurhayati. (2016). Revealing and Building the COSO Concept and Khalifatullah Fill Ard Philosophy to Prevent and Detect the Occurrence of Fraud Through Forensic Accounting. *Procedia - Social and Behavioral Sciences*. 219. 541-547

Nwakoby, R.A.E., Peace, N. and Jane, O.F.N. (2016) Impact of Forensic Accounting on Combating Fraud in Nigerian Banking Industry. *International Journal of Academic Research in Management and Business*, Vol.1, No.2

Okoye, E. I., & Gbegi, D. O. (2013). An evaluation of forensic accountants to planning management fraud risk detection procedures. *Global Journal of Management and Business Research*, 13(1)

Özkul, F. U., & Pamukçu, A. (2012). Fraud Detection and forensic accounting. In *Emerging Fraud* (pp. 19-41). Springer Berlin Heidelberg.

PCAOB, AU110 (2017) Responsibilities and Functions of the Independent Auditor, Public Company Accounting Oversight Board, Retrieved on the 2nd of April from <https://pcaobus.org/Standards/Auditing/Pages/AU110.aspx>

Peshori, C. K. S. (2015). Forensic Accounting a Multidimensional Approach to Investigating Frauds and Scams. *International Journal of Multidisciplinary Approach & Studies*, 2(3).

Pincus, K. V. (1989). The efficacy of a red flags questionnaire for assessing the possibility of fraud. *Accounting, Organizations and Society*, 14(1-2), 153-163.

Ponemon, L.A. (1995), "The objectivity of accountants' litigation support judgments", *The Accounting Review*, Vol. 70 No. 1, pp. 467-488.

Prabowo, H.Y. (2013) Better, faster, smarter: developing a blueprint for creating forensic accountants, *Journal of Money Laundering Control*, Vol.16, No.4

PricewaterhouseCoopers, LLP. (2011), Daubert Challenges to Financial Experts: An 11-year Study of Trends and Outcomes, PricewaterhouseCoopers, LLP, New York, NY. Retrieved on the 10th of April from <https://www.pwc.com/us/en/forensicservices/publications/assets/daubert-study-2010.pdf>

PricewaterhouseCoopers, LLP. (2013), Daubert Challenges to Financial Experts: A Yearly Study of Trends and Outcomes, PricewaterhouseCoopers, LLP, New York City, NY. Retrieved on the 8th of April from <https://www.pwc.com/us/en/forensic-services/assets/pwc-daubert-challenges-study.pdf>

Ramamoorti, S. (2008). The psychology and sociology of fraud: Integrating the behavioral sciences component into fraud and forensic accounting curricula. *Issues in Accounting Education*, 23(4), 521-533.

Ramaswamy, V. (2005). Corporate Governance and the Forensic Accountant. *The CPA Journal*, v. 75, p. 69-70.

Ramaswamy, V. (2011). New frontiers: training forensic accountants within the accounting program. *Journal of College Teaching & Learning (TLC)*, 4(9).

Rezaee, Z., Larry Crumbley, D., & Elmore, R. C. (2004). Forensic accounting education. In *Advances in Accounting Education Teaching and Curriculum Innovations* (pp. 193-231). Emerald Group Publishing Limited.

Rezaee, Z., Ha, M., & Lo, D. (2014). China Needs Forensic Accounting Education. *Open Journal of Social Sciences*, 2(05), 59.

Samuel F., J. (2015). Integrating Forensic Accounting Core Competency into the Study of Accounting. Case of Nigeria Tertiary Institutions. *Academic Journal Of Economic Studies*, Vol 1, Iss 3, Pp 38-64 (2015), (3), 38.

Seda, M. and Kramer B.K.P. (2014) An Examination of the Availability and Composition of Forensic Accounting Education in the United States and Other Countries. *Journal of Forensic & Investigative Accounting*, Vol. 6, Issue 1, January - June, 2014

Simeunovic, Grubor & Ristic (2016) Forensic Accounting in the Fraud Auditing Case. *The European Journal of Applied Economics*. Vol. 13, No.2

Singer, R. (2015) The Forensic Accounting Interview: A Powerful Weapon Against Fraud and Crime. Florida Atlantic University. Retrieved on the 10th of April from <https://accounting.fau.edu/blog/forensic-accounting-blog/the-forensic-accounting-interview/>

- Singleton, T. W., & Singleton, A. J. (2010). Background of Fraud Auditing and Forensic Accounting. *Fraud Auditing and Forensic Accounting, Fourth Edition*
- Smith, G.S. (2015) The Past, Present, and Future of Forensic Accounting. *The CPA Journal*, Vol 85 No.3, pp. 16-21.
- Van Akkeren, J., Buckby, S., & MacKenzie, K. (2013). A metamorphosis of the traditional accountant: An insight into forensic accounting services in Australia. *Pacific Accounting Review*, 25(2), 188-216.
- Warshavsky, M. S. (2013). The Role of Forensic Accountants in Litigation Cases. *CPA Journal*, 83(6), 58-61.
- Wells, J. T. (2003). The fraud examiners. *Journal of Accountancy*, 196(4), 76.
- West Virginia University (2007) Education and Training in Fraud and Forensic Accounting: A Guide for Educational Institutions, Stakeholder Organizations, Faculty and Students. *Auditor's Report*, 29(2), 1-4. Retrieved on the 2nd of April from <https://www.ncjrs.gov/App/Publications/abstract.aspx?ID=239254>
- Wolfe, D. T., & Hermanson, D. R. (2004). The fraud diamond: Considering the four elements of fraud. *The CPA Journal*, 74(12), 38.
- YIN, N., & SU, X. (2010). Japan's Forensic Accounting System: What Defects Does It Have in Operation and How to Reform It?. *Journal of Nanjing Normal University (Social Science Edition)*, 6, 009.

## Appendix A - Key terms used for recording attributes stated in job ads

Attribute	Key Terms
Analytical	Analytical, detail oriented, systematic, 'an eye for detail'
Forensic examination	Forensic examination, forensic investigation, forensic analysis, forensic inspection, forensic reviews
Problem solving	Problem solving, questioning, judicious
Spreadsheet	Spreadsheet, Excel
Word Processing	Word Processing, Microsoft Word
Presentation	Presentation, PowerPoint
Data analysis	Data analysis, data dissection, data inquiry
Database	Data base, data systems
Internet Research Tools	Research ability, information inquiry
Interpersonal	Interpersonal, team work, social, 'good with people'
Client management & Sale	Client management, dealing with clients, marketing
Testimony	Testimony, court appearances, evidence presentation
Interviewing	Interviewing, interrogation



## **Appendix B - List of all individual Job names**

- Forensic Accountant
- Mission Critical Forensic Accountant
- Forensic Auditor
- Senior Forensic Accountant
- Forensic Accountant Adviser
- Forensic Staff Accountant
- Senior Consultant - Forensic Accounting and Dispute Litigation
- Advisory Forensics Manager LMCC
- Forensic Accountant (Junior Level)
- Forensic Accounting Manager
- District Attorney Forensic Accountant
- Financial Data Exploitation Analyst
- Forensic Principal Accountant
- Forensic Analyst
- Litigation Associate
- Senior Director, Forensic Accounting and Advisory Service
- Corporate Bankruptcy and Reorganization Services Senior Consultant
- Analytics Anti-Money Laundering Senior Consultant
- Investigations Manager
- Forensic, Litigation and Valuation Services Staff
- Risk Advisory Services Manager
- Senior Manager, Risk Advisory Services
- Financial Investigations and Dispute Advisory Services Manager
- Forensic Fraud & Investigations Manager
- Forensic Executive - Surrey Practice
- Forensic Manager
- Forensic Executive
- Forensic Accounting Leader
- Financial Crime & Anti-Money Laundering Senior Manager
- Fraud and Investigations Manager
- Forensic Accountant Analyst
- Forensic/Risk Senior Consultant
- Senior Consultant Risk Accounting
- Manager Forensic Investigations
- Forensic Accounting Senior Associate
- Corporate finance and forensic accounting analyst
- Forensic Senior Manager
- Senior Manager Forensic Technology
- Risk & Financial Crimes Analyst
- Forensic Accounting Service Manager

- Fraud Investigation & Dispute Services Senior
- Forensic Litigation and Financial Crime Specialists
- Fraud Investigator
- Forensic Director
- Fraud Investigation Senior
- Senior Forensics Auditor
- Assurance Fraud Investigation Senior
- Forensic / eDiscovery Financial Advisory Director