



ELSEVIER

Contents lists available at ScienceDirect

Journal of Accounting Education

journal homepage: www.elsevier.com/locate/jaccedu

Accounts receivable: An audit simulation

Mark Edmonds^{a,*}, Tad Miller^b, Arline Savage^a^a University of Alabama at Birmingham, Collat School of Business, Accounting & Finance Department, 1150 10th Ave S, Birmingham, AL 35205, United States^b California Polytechnic State University, Orfalea College of Business, Department of Accounting, 1 Grand Ave, San Luis Obispo, CA 93407, United States

ARTICLE INFO

Article history:

Received 9 October 2017

Received in revised form 1 April 2019

Accepted 1 April 2019

Available online 29 April 2019

Keywords:

Audit

Accounts receivable

Confirmations

Risk

Sampling

Vouch

ABSTRACT

This simulation allows you to confirm accounts receivables electronically. It contains 1000 customer accounts from which you select a random sample. Confirmations are created and then sent to customers. Some confirmations are returned with discrepancies. For confirmations not returned, the simulation creates invoices, bills of lading, and purchase orders necessary for you to perform alternative procedures. Although the simulation requires little class time, you perform several audit procedures that help you gain an understanding of (1) the confirmation process; (2) alternative procedures for receivables; (3) the evaluation of audit evidence; (4) the preparation of work papers; and (5) statistical sampling as a tool to manage risk. The project requires approximately one hour to complete.

© 2019 Elsevier Ltd. All rights reserved.

1. Case

1.1. Background

This is your first week on the job at DC&H, LLP, a large regional accounting firm. As a new staff auditor, you have been assigned the task of completing the accounts receivable confirmation process for Charles Cabinets, a client of the firm. Many of the planning procedures for the engagement has already been completed by your senior. Based on conclusions reached by the audit team, risk of material misstatement (RMM) for the accounts receivable account have been assessed as low, indicating that the auditor believes the company has effective internal controls over the AR process.

Since this is your first time performing confirmation procedures, your senior has been kind enough to walk you through an exercise that uses data from Charles Cabinets. It is important that you understand the importance of accounts receivable confirmations and the process auditors follow in conducting these types of procedures. The next section contains a discussion between you and your senior intended to inform you of the various aspects of the confirmation process. The third section has step-by-step instructions on where to locate the files for this exercise and how to complete the exercise.

2. Discussion with your senior

As this is your first year as a staff auditor, your senior, Ms. Kim, has taken the time to answer some of your questions regarding the confirmation process. The purpose of this discussion is to inform you of the various aspects of the confirmation

* Corresponding author.

E-mail addresses: maedmond@uab.edu (M. Edmonds), cmiller@calpoly.edu (T. Miller), arlsav@uab.edu (A. Savage).

process to make sure you understand the process before beginning your testing procedures. The following sections outline the major questions you have asked your senior and her respective responses.

2.1. What are external confirmations and why are they important?

As you are brand new at the firm, Ms. Kim recognizes that you have little understanding of the confirmation process and why it is important. Ms. Kim explains that to understand what confirmations are, you must first recall what an accounts receivable balance represents. She reminds you that accounts receivable balances represent money owed to your client, Charles Cabinets, by its customers. In order to verify that the amounts owed to clients are valid and recorded accurately, auditors request that their clients sign a letter (e.g., a confirmation) requesting its customers to verify that they do indeed owe your client the amount recorded as an accounts receivable balance. She further explains that it is important to note that while the client signs the confirmation letter, the auditor mails and directly receives the returned responses from the client's customers. This is an important aspect of the process because accounts receivable balances represent assets to the firm and are normally first recorded as part of the revenue recognition process. For this reason, clients may have incentive to manipulate these balances in order to improve their financial position. In order to prevent the client from interfering in the confirmation process and thereby increasing the reliability of the information obtained, auditors request that the letters be returned directly to them.

This concept leads Ms. Kim into her answer to the next part of your question, “why are confirmations an important process to verify accounts receivable balances?” Recall that audit evidence obtained from third party sources (i.e., the client's customers) is more reliable than audit evidence gathered directly from the client. Returned confirmation requests represent externally generated audit evidence, which significantly increases the auditor's ability to rely on this information in making determinations regarding their clients' accounts receivable balances. Ms. Kim reminds you that many of the aspects of this discussion are covered in detail in the auditing standards, specifically [AU-C 505](#), External Confirmations.

2.2. What are management assertions and which assertion is tested via the confirmation process?

As a new staff auditor, you keep hearing the phrase “management assertions” and so you ask Ms. Kim if she will explain what they are and how they relate to the confirmation process. Ms. Kim tells you that management assertions are claims made by the client to the auditor concerning the transactions, account balances, and disclosures within the financial statements. While many management's assertions fall outside the scope of the confirmation process, the primary assertion auditors should be concerned with is *existence*. As it relates to accounts receivable, the existence assertion is a claim that there are no fictitious accounts receivable balances. In other words, all balances represent legitimate customers who do owe to the company the amounts listed as accounts receivable balances. Ms. Kim further explains that it is also important to understand how different assertions affect account balances. For instance, as it relates to existence, if the client were to include a fictitious customer, it would result in the ending account balance being overstated. Therefore, another way of looking at the existence assertion is the potential risk of accounts being overstated.

Ms. Kim then asks you to consider the relationship between accounts receivable and revenue. Given the desire to increase sales, you can see why the client may have incentive to overstate the balance for accounts receivable. She emphasizes that this client incentive is the reason why the existence assertion must be considered when testing the accounts receivable balance. While there are many ways to test to ensure that a customer's account balance is legitimate, the best evidence is gathered by directly contacting the customer and having them confirm that they do owe the company the amount of money indicated by the client. Hence, sending confirmations is the most appropriate method of testing the existence assertion for accounts receivable. In fact, Ms. Kim notes that the auditing standards (AU 505.03) require the confirmation of accounts receivable unless the overall account balance is immaterial, the confirmation procedures would be ineffective (e.g. controls are so weak that the balances on the confirmations would likely be incorrect anyway), or other effective substantive procedures are used (e.g., alternative procedures).

2.3. Are there different types of confirmation requests? What are the advantages and disadvantages of each?

One of the things you are curious about is whether all confirmation requests are the same or if auditors use different types of confirmation requests. Ms. Kim explains that there are two primary types of confirmation requests that auditors can choose from, depending on the level of assurance they wish to obtain from confirmation testing.

The first type of confirmation request, which yields the lowest level of assurance, is called a negative confirmation request. This type of confirmation includes the balance owed to the client and provides the least amount of assurance, as customers are only asked to reply to the request if they disagree with the balance shown on the confirmation. Ms. Kim explains that while these types of confirmations are an efficient means of performing confirmation testing, they provide less assurance because the auditor cannot know if a customer failed to respond because they agree with the account balance listed on the confirmation or for other reasons not related to the customer's balance. Ms. Kim notes that the auditor would only send negative confirmation requests for accounts where the risk of a material misstatement had been assessed as low.

Ms. Kim tells you that the next type of confirmation, the positive confirmation request, provides a higher level of assurance. By asking customers to respond regardless of whether or not they agree with the information on the confirmation,

auditors can narrow the reasons for unreturned confirmation requests. Ms. Kim explains that this is the most commonly used type of confirmation request as it yields a high level of assurance and the most returned confirmation requests.

2.4. How do auditors decide which customer balances to confirm?

Now that you understand the confirmation process and why it is important, you are curious about how auditors decide which customer balances to confirm. Ms. Kim starts by explaining that this part of the process requires judgment by the auditor as there are various methods for selecting which customers to confirm. First, Ms. Kim wants you to understand that auditors only select a sample of customers to confirm, rather than sending confirmation requests to all customers. Auditors only require reasonable assurance that the financials do not contain material misstatements, as opposed to absolute assurance. Auditors generally have two different types of sampling methods for selecting customers, judgmental sampling and statistical sampling. Ms. Kim believes that it is important to understand the difference between these two methods.

She starts by telling you that judgmental sampling, also known as non-statistical sampling, relies on the auditor's judgment to select a sample instead of using a formal statistical method. Since judgmental sampling allows the auditors to make determinations such as the size of the sample, which items to select, and how the results of the sample should be analyzed, it is often considered to be a less objective approach to audit sampling. However, Ms. Kim cautions you that while judgmental sampling is less objective, in some circumstances it provides a better approach because information known about the client may lead the auditors to select accounts that represent higher risk.

Ms. Kim tries to help you easily digest these differences by asking you to view statistical sampling as allowing the computer to select the sample, instead of the auditor using her or his judgment to pick customers to confirm. While there are several different types of statistical sampling, the audit team for Charles Cabinets relies on a commonly used method known as mean-per-unit (MPU) sampling.

Ms. Kim tells you that MPU sampling allows auditors to estimate the value of the population based on a sample. She uses an example to help you wrap your mind around this concept. Assume you have a total population of 1000 customer accounts in accounts receivable, and you take a sample of 100 of them. Adding up the individual values of the 100 customer accounts gives you a total balance of \$5000; therefore, the average customer balance in your sample is \$50 ($\$5000/100$). You can use the average from your sample to estimate the value of the population by multiplying the average customer balance from your sample times the number of items in the population, giving you a balance of \$50,000 ($\50×1000). Ms. Kim explains that while this example is useful in understanding MPU sampling, it is important to understand the concept of sampling risk before considering other aspects of sampling.

Sampling risk refers to the possibility that the conclusions reached by the auditor from the sample are different from the reality existing in the total population. Ms. Kim asks you to recall information you learned in your statistics course to understand how the concepts of sampling risk relate to auditing. In statistics, alpha (or Type I) risk is associated with confidence intervals and beta (or Type II) risk is associated with hypothesis testing. In auditing literature, these correspond with the risk of incorrect rejection (alpha risk) and the risk of incorrect acceptance (beta risk). The risk of incorrect rejection is the risk that the sample supports the conclusion that a material misstatement exists when, in fact, it does not. The risk of incorrect acceptance is the risk that the sample supports the conclusion that a material misstatement does not exist when, in fact, it does (ASB 2016 AU-C Section 530.05).

Ms. Kim recognizes that many new auditors often find this information confusing, so she provides you with a table (Table 1) to make these concepts clearer. Table 1 shows the four possible outcomes discussed previously. The rows in the table represent the possible true state of the accounts receivable balance. Either the accounts receivable balance in the financial statements is fairly stated or it is not. Of course, auditors never learn which row is the true state of affairs, because they only sample the accounts receivable balances. The two columns on the right side of the table show the conclusion the auditor makes based on the sample results. Ms. Kim stresses that auditors never know which row in the table represents the true state of nature, meaning auditors never actually know the actual achieved level of sampling risk. Instead, alpha and beta represent the probability of reaching an incorrect conclusion.

Now that you understand the basics of sampling risk, Ms. Kim takes a minute to explain how these risks impact the audit as a whole. The risk of incorrect rejection means that the auditor concluded from the sample that a material misstatement exists when in actuality it does not exist. This misconception increases the probability that the audit team will expand the scope of the audit or attempt to modify its opinion. This incorrect conclusion will lead to inefficiency and may harm the firm's relationship with the client. Conversely, the risk of incorrect acceptance implies that the auditor concluded from the sample that a material misstatement does not exist when in fact a material misstatement does exist. This could lead the auditor to issue a clean opinion on financial statements that do contain material misstatements. She cautions you that issuing a clean opinion on materially misstated financials could lead investors to take legal action against the audit firm.

As both of these risks have negative impacts on the audit as a whole, you ask Ms. Kim to explain how auditors mitigate these risks. Ms. Kim tells you that generally speaking, the smaller the size of an auditor's sample, the more likely he or she will encounter either of these risks. The more items an auditor selects, the more likely it is that the conclusions reached from the sample will hold true in the population as a whole. However, she cautions you that when samples are larger than necessary, auditors perform excessive procedures, which reduces the engagement's profitability and also imposes an inconvenience on the client. At the extreme, firms that consistently perform excessive procedures price themselves out of the market.

Table 1
Type I and type II errors.

If accounts receivable are actually	Auditor concludes accounts receivable are	
	Fairly presented	Materially overstated
Fairly presented	Correct conclusion	Incorrect rejection α risk or Type I risk
Materially overstated	Incorrect acceptance β risk or Type II risk	Correct conclusion

At this point, Ms. Kim explains that it is important to recall that the auditor sets the planned level of sampling risk, which in turn is used to calculate the appropriate sample size. Therefore, the sample size used by the auditor is intended to reduce sampling risk to an acceptably low level, but not eliminate it entirely. Ms. Kim knows that these terms and concepts are often confusing and reminds you that much of this conversation will make more sense once you calculate the sample size for your client, Charles Cabinets.

2.5. How do auditors respond to a situation in which customers do not reply to confirmation requests? What happens if the customer disagrees with the information on the confirmation request?

As you are thinking about this whole process, it dawns on you that the client's customers have no obligation to reply to the confirmation request. Further, you are confused about the steps the auditor would take if the client's customer disagrees with the amounts shown on the confirmation request. Ms. Kim compliments you on thinking more deeply about the process and tells you that these issues are addressed by performing alternative procedures.

She explains that alternative procedures are additional steps the auditor takes in order to test the existence assertion in the absence of returned or disputed confirmation requests. She reminds you that the first alternative procedure is to send a second request, as a reply to the confirmation request represents the highest quality evidence an auditor can receive to test the existence of accounts receivable. How many requests an auditor wants to send is a matter of auditor judgment, but regardless of how many requests an auditor sends, some customers will not reply. Ms. Kim's response leads you back to one of your original questions: What alternative procedures does an auditor perform if a customer refuses to reply or disputes the information on the confirmation?

Before answering your question directly, Ms. Kim reminds you that it is important to think of the audit timeline to better understand the types of alternative procedures available to the auditor. Recall that the auditor often performs confirmation procedures after the balance sheet date. For example, let's assume that the client's balance sheet date is on December 31, 20X1 and the auditor is conducting confirmation procedures of the December 31 balance on February 1, 20X2. Notice that at least a month has passed since the client's accounts receivable balances were outstanding on December 31, 20X1. Ms. Kim explains that this timing difference means that some of the accounts receivable balances that were outstanding as of December 31, 20X1 may have been paid by the time the auditor is performing confirmation procedures. Therefore, if a customer fails to respond to a confirmation letter, the auditor's best alternative procedure is to check to see whether the balance has been paid. This alternative procedure is known as checking for a "subsequent receipt". If a balance has been paid, an auditor can easily review the subsequent receipt of payment and conclude that the balance must have existed since it was paid in full.

Ms. Kim's response makes sense to you, but leads you to a follow up question, what if the customer hasn't paid the balance yet? Ms. Kim is delighted that you are thinking through the process and explains that under these circumstances, it is necessary to look at the supporting documentation for the transaction that led to the recording in the accounts receivable account to verify that it is a legitimate transaction. The majority of transactions include an audit trail, with common documents including a purchase order, invoice, and bill of lading. A purchase order provides external evidence that there was an agreement between the customer and your client. The invoice provides evidence that your client has billed the customer. Finally, the bill of lading provides evidence that the goods were shipped and the revenue was earned as of the balance sheet date. Ms. Kim explains that in the absence of a returned confirmation request or disputed confirmation request, an auditor can vouch¹ these supporting documents to the amounts recorded in the accounts receivable subsidiary ledger, thereby verifying that the amount recorded as a receivable actually exists and the amount recorded is appropriate.

Ms. Kim can tell that at this point in the conversation, you may be suffering from information overload and takes the time to remind you that it isn't necessary for you to memorize all the audit procedures she has discussed. She explains that all auditing procedures, including alternative procedures, are summarized in an audit work program. She tells you that an audit work program is similar to a pilot's pre-flight checklist. It ensures that the auditor has performed all the necessary proce-

¹ Vouching means picking a sample from the accounting records (e.g., the accounts receivable sub-ledger) and comparing information from the accounting records to supporting documentation, often referred to as source documents. Vouching is a test of the existence assertion due to the direction of testing; from the accounting records to source documents.

dures required to obtain reasonable assurance over the client's accounts receivable balances. She provides you with an example of an audit work program for confirmation procedures in [Table 2](#).

2.6. How do auditors evaluate the results of their confirmation procedures?

Now that you understand the confirmation process, you ask Ms. Kim to explain how auditors evaluate the outcomes from performing confirmation procedures. She explains that auditing standards require auditors to project the error rate from the sample to the population in order to arrive at an amount of projected misstatement. This projected misstatement is then compared to the tolerable misstatement to determine if an adjustment is necessary. Tolerable misstatement represents the maximum acceptable error within a financial statement account that an auditor can accept before concluding that a material misstatement exists. In other words, if the misstatement calculated by the auditor is less than tolerable misstatement, no adjustment is necessary. However, if the misstatement is greater than the tolerable misstatement, the auditor must request that the client record an adjustment. Ms. Kim cautions you that even when the projected misstatement is less than the tolerable misstatement, the level of risk may be unacceptable if the difference between the projected misstatement and tolerable misstatement is small ([ASB 2016 AU-C Section 530.A26](#)). In such circumstances additional audit procedures may be necessary to reduce the risk of reaching an incorrect conclusion.

One thing Ms. Kim wants you to keep in the back of your head when making these conclusions is the consideration of the allowance for sampling risk. Since we do not test 100% of the population, but rather a sample, there is always a risk that the sample does not adequately represent the overall population. To account for this risk, auditors consider an acceptable allowance for sampling risk which is used as a factor for determining the appropriate sample size.

2.7. How do auditors document their work throughout the confirmation process?

Ms. Kim seems pleased that you asked this particular question and reminds you of the famous accounting adage “if it isn't documented, it isn't done!”. Ms. Kim tells you that auditors document their work in “work papers”. Each work paper contains a reference which can be used to create a paper trail of the steps taken by the auditor to reach a conclusion. She provides you with a copy of an example work paper ([Table 3](#)) to use as a reference when conducting your own testing.

Ms. Kim points out that each work paper contains some key elements to ensure that the auditor has appropriately documented their work. As an example, you'll notice that the work paper provided by Ms. Kim ([Table 3](#)) references the date the work was performed, the client under audit, the auditor who performed the work, the type of test performed, the objective of the test, the assertions tested, the tolerable error for the account, a description of the procedures performed, and the conclusion reached by the auditor as a result of his or her testing. Ms. Kim tells you that audit documentation should be in sufficient detail to allow auditors who are new to the engagement to understand the procedures performed in the prior audit. This is something you will appreciate given that you are new to the engagement, and last year's work papers will assist you in conducting your testing during the current year audit. Ms. Kim tells you that if you have any further questions about how to document your work, you should refer to the auditing standards regarding audit documentation at AU-C Section 230.02.

2.8. Is there anything else I should know before beginning confirmation procedures for Charles Cabinets?

Thanks to the conversation with Ms. Kim, you now have a much better understanding of the confirmation process and you feel ready to begin your work on your client, Charles Cabinets. Ms. Kim encourages you to refer to the auditing standards if you have any further questions about the process and instructs you to begin your testing of Charles Cabinets accounts receivable balance. You thank Ms. Kim for her time and begin your work on the audit simulation.

3. Description of audit simulation

Now that you understand the concepts involved in the confirmation process, you are ready to begin your work on an audit simulation intended to mimic confirmation procedures performed by auditors in the field. The simulation will be conducted in Microsoft Excel and you will use Microsoft Word to create audit work papers to document your work. The simulation is intended to walk you through confirmation procedures for your client, Charles Cabinets. Throughout the simulation you will have the opportunity to perform many of the procedures described by Ms. Kim during your conversation.

3.1. Locating the simulation files

All files related to the simulation should be provided by your professor. You will want to make sure you have all of the following files in the same folder on your hard drive before beginning the simulation:

- AR Confirmation Simulation (Excel File)
- Confirms (HTML Document)
- TemplateBOL (HTML Document)

Table 2

Audit program for confirmation procedures.

Confirm accounts receivable	Performed		Work paper Reference
	By	Date	
Determine appropriate sample size			
Send first confirmation request			
Send second confirmation request			
Perform alternative procedures			
Check for subsequent receipts			
Vouch account balance to invoice			
Vouch invoice to bill of lading			
Vouch bills of lading to purchase order			
Evaluate results of confirmation and alternative procedures			
Conclude on the existence of accounts receivable			

Table 3

Example audit work paper.

Work paper (reference number)	
Client name:	Performed by:
Transaction cycle:	Date:
Class of transactions or account:	
Nature of test: <i>Analytical procedure, test of details, test of balances, test of controls</i>	
Objective: <i>Objective of the test</i>	
Assertion(s): <i>Management assertions being tested</i>	
Tolerable error: <i>Either a dollar amount or a percentage of the account balance</i>	
Procedure: <i>Description of the procedure performed in sufficient detail to allow auditors who are new to the engagement to understand the procedures performed in the prior audit and must also provide guidance on how to perform the procedure in the current engagement</i>	
Conclusion: <i>Evaluation of the results of the procedure or a conclusion regarding the account or class of transactions</i>	

- TemplateConf (HTML Document)
- TemplateInv (HTML Document)
- TemplatePO (HTML Document)

In addition to the simulation files, you have also been provided with a copy of last year's work papers to serve as a guide for creating the current year's work papers. You will create the current year work papers in Excel worksheets created for you in the Excel workbook. Ensure that you have the prior year's work papers by checking that you have the following file:

- Prior Year Workpapers

Once you have confirmed that you have all the necessary files for the simulation, begin by opening the Excel file "AR Confirmations Simulation". When opening the Excel workbook you will be prompted to enable content from the workbook. Select enable content to ensure all elements of the Excel workbook function properly. You will probably need to enable macros for Excel to run the simulation. If your computer's security settings are too restrictive, it may not allow you to enable the macros, in which case you will need to relax the security settings on the computer. Once you have the Excel workbook open, proceed to the next section for a description of each work sheet within the workbook.

3.2. Description of Excel workbook

When you open the Excel workbook, you will notice that it contains several work sheets as follows:

1. Case Instructions	This worksheet provides a description of each worksheet within the workbook and step-by-step instructions for completing the simulation. Make sure you have read all the information within this work sheet prior to beginning the simulation
2. WP 1 – Sample Size Calculation	You will use this worksheet to perform your sample size calculation for the current year. Make sure you utilize the prior year work paper as a guide for how to complete this work paper for the current year
3. WP 2 – Evaluation of Results	You will use this worksheet to extrapolate the results from your testing to the overall population of accounts receivable balances to determine if any adjustment is required. Make

	sure you utilize the prior year work paper as a guide for how to complete the work paper for the current year
4. WP 3 – Summary of Testing	You will use this worksheet to document the procedures you performed and the conclusions reached from your testing procedures
5. Summary	This worksheet contains the inputs for the simulation which will be used to select customers for confirmation testing. Calculations built into this Excel workbook will randomly select customers for confirmation testing and populate the remaining work sheets with the selected sample
6. Results	This worksheet displays all customers selected for confirmation testing from the inputs in the summary worksheet. You will use the open cells in this worksheet to document the results of your confirmation testing procedures. Note that you are only required to input 5 items into each column of the worksheet and the remaining items will auto-populate in order to reduce the redundancy of this exercise
7. Random Numbers	This worksheet contains the randomly selected numbers corresponding to the customers selected for confirmation testing based on your inputs into the summary worksheet
8. Sample	This worksheet will appear once you have pressed the “create” button on the summary worksheet. It shows all the customers selected for confirmation testing based on your inputs into the summary worksheet

Prior to beginning the simulation, ensure that your workbook contains all the necessary worksheets described above. You will complete all portions of this simulation within the Excel workbook. Note that green-shaded tabs within the workbook require your input, while non-colored tabs require no input from you.

3.3. Case instructions

This section contains detailed instructions related to the brief instructions provided on the “Case Instructions” worksheet. To begin the simulation, open the Excel workbook “AR Confirmations Simulation” and select the “Case Instructions” work sheet within the workbook. Also make sure you have both of the prior year work papers open (“Prior Year Workpapers”) to serve as a reference for creating the current year work papers. Begin by reading through all the information on the “Case Instructions” work sheet to get a feel for all the steps required to complete the simulation.

3.3.1. Calculating sample size

Your first step in the simulation is to calculate the sample size for confirmation testing. You will perform your calculation and document your work within the “WP 1 – Sample Size Calculation” worksheet. This worksheet contains several input boxes where you will add the necessary data, found in the “Summary” worksheet, to compute the sample size to be used in confirmation testing. Use the prior year “Workpaper 1A” as a guide to assist you in calculating sample size for the current year audit. When entering values into the current year workpaper, make sure you understand what each value means, as well as its relationship to audit risk.

While some of the values you will enter into your sample size calculation are self-explanatory, others may be less clear and may require an explanation to make sense. Recall from your conversation with Ms. Kim that auditors use judgment to set alpha levels thereby limiting the likelihood of making a Type I error. Remember that in the context of an audit, a Type I error would occur if the auditor concluded that an account is not fairly stated (i.e., a material misstatement exists) when in fact, the account is fairly stated. You can think of alpha as the probability of making a Type I error. For example, if we set alpha at 5% or 0.05, the auditor would be taking a 5% chance of making a Type I error or a 95% chance of avoiding a Type I error. For purposes of this audit, the audit team has decided that an alpha of 20% or 0.20 is appropriate. You will notice that this value has already been entered for you within the current year work paper.

After the audit team has decided on the appropriate alpha level, they need to convert this value into a critical value or Z-score. A Z-score indicates how many standard deviations a data point is from the mean in a normal distribution curve. In other words, if a data point is greater than a Z-score of 1, then that data point is more than 1 standard deviation from the mean. We compare our test statistic to this value to make a determination as to whether to reject or accept the null hypothesis (H_0). In the context of an audit, the null hypothesis states that the account balance is fairly stated (i.e., there is no material misstatement). Therefore, if we accept the null hypothesis, we conclude that the account balance is fairly stated, but if we reject the null hypothesis, we cannot conclude that the account balance is fairly stated.

To determine the Z-score based on a particular alpha level, you will need to use a Z-table, which can be found at the following link: <http://www.statisticshowto.com/tables/z-table/>. This link is also provided on “WP 1 – Sample Size calculation”. The values within the Z-table represent the proportion of the curve that is less than alpha. For example, if you have an alpha of 0.30 as shown in the prior year work paper, the area remaining under the curve is 0.70 (1–0.30). Since we are not testing for a particular direction (i.e., the account balance could be overstated or understated) we will be conducting a two-tailed test requiring us to divide our alpha level by 2. In this example, we divide 0.30 by 2, giving us 0.15 and leaving 0.85 of

the curve less than alpha. If you look up 0.85 in the Z-table you will find a Z-score of 1.04. Use this same procedure to calculate the Z-score for an alpha of 0.20 within the current year work paper.

Now that you have considered the risk of making a Type I error, you need to next consider the risk of making a Type II error or β . Recall from your conversation with Ms. Kim that a Type II error occurs when the auditor concludes that an account balance is fairly stated (i.e., no material misstatement exists), but in reality the account is not fairly stated. The likelihood of making a Type II error is related to the power ($1 - \beta$) of a statistical test. You can think of statistical power as the likelihood of a finding an effect or rejecting the null hypothesis. As statistical power increases, we are less likely to make a Type II error. Two common methods of increasing the power of a statistical test are (1) to increase the assessed level of alpha, and/or (2) increase the size of the auditor's sample. Notice that increasing alpha will result in an increased risk of making a Type I error, meaning auditors have to use judgment to correctly balance these two types of risk. To simply your work, the audit team has set the power level for you. For more information about these risks and their impact on the audit, we recommend reading the audit guidance given in AU Section 350 – Audit Sampling.

Once you have filled in all the necessary information to calculate sample size in “WP 1 – Sample Size Calculation”, the Excel sheet should compute the sample size to be used for confirmation testing. Before moving forward with your computed sample size, check to ensure that the computed sample size is reasonable. Sample sizes less than 20 or more than 200 should be considered unreasonable (i.e. your sample size for this simulation should be between 20 and 200). Once you have ensured your computed sample size is reasonable, input the sample size calculated in your work paper into the “Summary” worksheet and proceed to the next part of the simulation.

3.3.2. Sending confirmation requests

Now that you have made your determination of how many customers you will send confirmation requests to, the next part of this exercise will simulate sending the confirmation requests. Recall from your conversation with Ms. Kim that, while the management of Charles Cabinets will assist you in preparing the confirmation requests, auditors are required to mail and directly receive the returned confirmation requests. In an actual audit, the audit team would ensure that all confirmations are mailed from a public post office or the audit firm mail room to verify that they are not tampered with.

To simulate this process, press the “Generate” button within the “Summary” worksheet. Clicking the “Generate” button will randomly select the number of customers matching your sample size from the full population of customers. After pressing the “Generate” button, Excel will prompt you that it will need to delete tabs from the workbook to which you will select “Delete”. You will notice that a new tab called “Random Numbers” will be added to the workbook. You can review this tab to see the customer numbers randomly selected for confirmation testing. Next, click the “Create” button within the “Summary” worksheet to prepare the confirmation requests for the randomly selected customers. You can review these confirmations in your web browser by pressing the yellow “Confirms” link in cell “G14” on the “Summary” worksheet. Excel may prompt you regarding a security concern, to which you will select “Yes”. You will notice that the audit team is using a positive confirmation request in that they have provided the customer's balance on the confirmation template and customers are asked to respond regardless of whether or not they agree with the balance listed on the confirmation. Recall from your conversation with Ms. Kim that these types of confirmations yield stronger audit evidence than negative confirmation requests to which customers are asked to respond only if they disagree with the information listed on the confirmation requests. At this point in the simulation, assume that you have obtained the signed confirmation requests templates back from Charles Cabinets management and mailed the confirmations from DC&H's mail room.

After one week, you go to DC&H's office and collect the confirmation responses that have been returned. In the simulation, you retrieve the first round of confirmations by clicking the “First” button in the “Summary” worksheet, which is equivalent to picking up the mail from DC&H's office. You can observe the returned confirmations requests in your web browser by clicking the green “First” link in cell “G22” within the “Summary” worksheet. Begin your testing of these confirmations by agreeing² the customer name, address and balance on the confirmation response with the corresponding information from the accounts receivable subsidiary ledger, accessible under the “Results” worksheet. To document your work, enter the balance confirmed by the customer into the “1st Balance” column within the “Results” worksheet. You are only required to enter the first 5 confirmations and the remaining returned confirmations will auto-populate to reduce the redundancy of this exercise.

For this exercise, whenever the confirmed amount disagrees with the accounts receivable subsidiary ledger, you are to assume that the amount confirmed by the customer is correct. On actual engagements, you would investigate such discrepancies because they are not always errors. For example, customer payments that are in transit on December 31st can create discrepancies, as can shipments that are in route to customers as of December 31st. Again, for today's exercise you should assume the amount reported by the customer is correct.

Unfortunately, not all customers respond to confirmation requests. Last year's work papers indicate that only 22 out of 44 customers responded. You can see the number of customers who replied to the first request for the current year audit in the teal box below the “First” button on the “Summary” worksheet. If confirmations are scheduled early in the audit process, we should be able to mail a second round of confirmations to increase our response rate. Assume that approximately one week after mailing the first confirmation requests, you mail a second request to those customers who have not yet responded. To

² Auditors use the word “agree” to describe the process of comparing information from supporting documentation (e.g., confirmation requests) to the information included in the accounting records (e.g., accounts receivable subsidiary ledger).

perform this step in the simulation, click the “Second” button within the “Summary” worksheet, which electronically mails confirmations to those customers who have not yet responded.

Responses to the second confirmation request can be viewed using the green “Seconds” link in cell “G26” of the “Summary” worksheet. Use the same process as the first round of confirmations to document your results within the “Results” worksheet by entering the confirmed balance in the “2nd Balance” column. Again, you will only need to enter 5 customers and the remaining balance will auto-populate to reduce redundancy. Looking back at the summary worksheet, you will see the number of customers who replied to the second request in the teal box below the “Second” button. By adding up the total number of customers who responded, you will notice that you still have not received replies to all the confirmations you sent. Due to a limited amount of time to complete confirmation testing, you have elected to perform alternative procedures to test those customer balances that have not been confirmed.

3.3.3. Performing alternative procedures

Since customers are not obligated to reply to confirmation requests, it is likely that you will have some unreturned confirmations. However, per your conversation with Ms. Kim, you are aware that you can perform alternative procedures to obtain assurance regarding these unreturned requests. You would begin by asking the client whether any of the balances related to unreturned confirmations have been paid in order to check a subsequent receipt. Unfortunately, as of the current date, none of the customers have paid their outstanding balances. While this is less than ideal, you remember Ms. Kim explaining that you can still test these balances by vouching supporting documentation such as purchase orders, invoices, and bills of lading (BOL) to verify that the transaction leading to the outstanding balance is legitimate and actually occurred.

To perform this procedure, click the “Alternative” button within the “Summary” worksheet to generate copies of the purchase orders, invoices, and BOLs for those customers who have not returned their confirmations. You can view this supporting documentation in your web browser by clicking the green “POs”, “BOLs” and “Invs” links in cells “E32”, “G32”, and “J32” within the “Summary” worksheet. To perform this test, begin by comparing the information across the three pieces of supporting documentation to ensure it is consistent. Next, agree the customer’s name, address, amount and date on the PO with the information on the accounts receivable subsidiary ledger on the “Results” worksheet. To document your work, enter the balance from the PO in the “PO Amt” column within the “Results” worksheet. Repeat this procedure using the information from the BOLs and invoices, also entering these amounts on the “Results” worksheet in the appropriate column. Recall that you only need to enter the first 5 balances and the remaining amounts will auto-populate.

This concludes the testing portion of confirmation testing within this simulation. You are now required to prepare the remaining work papers for evaluating the results from your testing procedures and documenting the work you performed.

3.4. Evaluation of results

In this section, you will document your work in your second work paper “WP 2 – Evaluation of Results”. Recall from your conversation with Ms. Kim that you will be using MPU sampling to evaluate the reasonableness of the accounts receivable account. To evaluate the total balance, you need to calculate the average customer balance in your sample and multiply this amount by the total number of customers in the population. Note that you can use the “Sample” worksheet to obtain the total customer balance and standard deviation of the total sample balance.³ This results in a projected total balance of AR based on the results from your sample. The difference between this project balance and the recorded book value of accounts receivable is the projected misstatement of the receivable balance.

Prior to making your final conclusion regarding the fair presentation of accounts receivable, you need to consider sampling risk. Recall that sampling risk represents the possibility that the conclusion reached by an auditor based on a sample is different from the conclusion she or he would reach if the entire population had been tested by using the same procedure. An easy way to understand sampling risk is to think of the error rate in popular public polls. Most polls provide a range of values plus and minus the mean to illustrate the potential sampling error within the poll results.

To calculate the potential sampling risk, boxes have been provided in “WP 2- Evaluation of Results” to enter the information required to calculate sampling risk, based on the parameters set by the audit team. You do not need to reinvent the wheel. Use prior year’s “WP 2” to help you understand the work to be performed and serve as a guide for preparing this year’s workpaper. However, don’t let yourself become mechanical because circumstances will change from year to year. It is essential that you (1) understand why you are performing the procedures, (2) objectively evaluate the results of your procedures, and (3) update the work papers accordingly. Update the current year work paper using a similar procedure to last year. The next section will require you to document the work you performed and the conclusions you reached as a result of your testing procedures.

3.5. Document your work and conclusions reached

The old saying in audit is that if it isn’t documented it isn’t done. Last year’s audit team used prior year workpaper “WP 2” to document the procedures performed and conclusions reached from last year’s audit. You will need to complete a similar

³ In Excel, you can use the formula “=stdev(total customer balance from Sample” worksheet) to obtain the standard deviation of the sample.

work paper for the current year audit in the “WP 3 – Summary of Testing” worksheet within the Excel workbook. Feel free to copy and paste information from the prior year workpaper to save time but ensure that all information on the current year workpaper is updated to reflect the procedures you performed and the conclusions you reached during your testing. The completion of this workpaper marks the end of the simulation portion of this exercise.

3.6. Critical thinking questions

Due to the nature of completing a simulation, several aspects of the confirmation process were simplified to create an efficient means of covering the basics of confirmation testing. We have provided the following critical thinking questions related to confirmation testing to assist you in thinking about more complex aspects of the confirmation process. Document your responses to the following questions in a separate word document:

1. In this simulation, no exceptions were noted during testing. Do you think auditors are likely to encounter exceptions during a real world audit? What procedures would the auditor perform in the event of a customer disagreeing with the information on the confirmation request?
2. The audit team elected to set alpha at 0.20. Is this an appropriate alpha level? Why or why not?
3. How does changing alpha or beta influence the size of your sample? Describe the relationship between sample size and sampling risk.
4. When asking the client for subsequent receipts, the client indicated that none of the outstanding balances have been paid. What additional concerns does this raise for the auditor?
5. Did you find any discrepancies during your testing? If so, how would these influence the audit team’s assessment of control risk?

3.7. Simulation deliverables

This section describes all the deliverables required to fully complete the simulation. To confirm that your simulation is complete, check to ensure that you have completed all green shaded tabs within the Excel workbook. This includes adding input to all red bracketed areas within the three current year work papers “WP 1 – Sample Size Calculation”, “WP 2 – Evaluation of Results” and “WP 3 – Summary of Testing”. Make sure you have input the required sample size and student ID into the “Summary” worksheet. Lastly, ensure that all columns within the “Results” tab contain the audited balances entered during your testing procedures. Once you have checked that all fields are complete, save the Excel workbook with your last name as follows “AR Confirmation Simulation – Last Name”.

Next, make sure you have answered all the critical thinking questions in a separate word document. Make sure your answers are clearly stated and well thought out for all four questions. Save this document as “AR Confirmation Simulation – CCTQ – Last Name”.

In the event that your professor has provided you a grading rubric for this simulation, check your work against the grading rubric to ensure you have met all the requirements related to this simulation. Finally, submit both the Excel workbook and Word document to your professor according to his or her file submission instructions. Thank you for taking the time to complete this simulation. We hope it helped to clarify many of the aspects of the confirmation process.

4. Case learning objectives and implementation guidance

4.1. Literature review

We conducted a search of *Journal of Accounting Education*, *Advances in Accounting Education*, and *Issues in Accounting* to identify similar cases that focus on the audit of accounts receivable and/or audit sampling. We found 4 cases that involve the audit of the accounts receivable process (Andiola, Lambert, & Lynch, 2018; D’Aquila & Capriotti, 2011; Ashbaugh & Johnstone, 2000; and Hogan, Bierstaker, & Seltz, 2001) and five cases that discuss audit sampling specifically (Bamber & Bylinski, 1984; Dickins, Fallatah, & Higgs, 2013; Dykxhoorn & Sinning, 1984; Gifford & Howe, 2012; Paul, 1994).

From a broad perspective, cases focusing on the audit of the accounts receivable process range from clearing review notes (Andiola et al., 2018), measuring professional skepticism (D’Aquila & Capriotti, 2011), application of financial accounting standards (Ashbaugh & Johnstone, 2000), and testing AR related investments (Hogan et al., 2001). While many of these cases include aspects of our case, such as the completion of audit work papers and use of excel, none of these cases focus strictly on the performance of AR confirmation procedures.

In regard to audit sampling, the literature covered many aspects of this topic, including examining the lack of uniformity in statistical audit sampling terminology (Dykxhoorn & Sinning, 1984), clarifying what is meant by attribute sampling (Bamber & Bylinski, 1984; Paul, 1994), providing context for discussions of audit sampling and sampling risk (Gifford & Howe, 2012), and using a non-auditing context to illustrate audit sampling concepts (Dickins et al., 2013). While Dickins et al. (2013) discuss similar aspects of audit sampling as our simulation, the authors apply these concepts in a non-

auditing context and only provide a discussion question requiring students to consider how sampling risk applies to the confirmation process.

Currently there is no published case that includes the various aspects of our case, covering in detail descriptions of the AR confirmation process, audit sampling and sampling risk, evaluation of sampling results, and the use of Excel to mimic performing actual confirmation procedures. Further, we require students to prepare audit work papers covering these topics to provide a realistic auditing experience. We believe our simulation provides an opportunity for students to see how the concepts learned in the classroom apply to the performance of actual auditing procedures. The critical thinking questions also provide an opportunity to further discussion of confirmation procedures in the classroom.

4.2. Overview of case

The simulation requires students to perform AR confirmation procedures for a fictitious client Charles Cabinets. The simulation requires students to calculate the appropriate sample size for confirmation testing, evaluate the results obtained from the sample and document their work within audit work papers. The simulation consists of 1000 customer accounts, and it creates a unique sample for each four-digit student ID. Using customer data, the simulation creates confirmations, responses to confirmations, invoices, bills of lading and purchase orders in the form of *.html files which are readable with most web browsers.

4.3. Learning objectives

Our goal in creating this simulation is to provide a more realistic method of teaching the confirmation process than the typical discussions that occur in auditing classrooms. Students often find it difficult to visualize the procedures performed by auditors. This simulation helps to reduce this confusion by having students actually perform these procedures using actual audit evidence. Similarly, discussions about audit sampling without providing hands-on experience are often confusing for students. We have addressed these concerns throughout the simulation and summarized our goals into the following learning objectives:

- Students complete the confirmation process
- Students perform alternative procedures for unreturned confirmation requests
- Students observe tangible examples of audit evidence
- Students calculate sample size for confirmation testing
- Students discuss sampling risk
- Student form a conclusion and document their work in audit work papers

The learning objectives for this simulation have been summarized in [Table 4](#). Also included is the location within the simulation files where each learning objective is discussed.

4.4. Where to locate the case files

The following materials are available on our accounting dropbox at the following link: <https://bit.ly/2FAW6Kc>

- A zip file containing only the files a student will need to complete the simulation.
- A word document containing all instructions for students (first section of this paper)
- The simulation files within an Excel workbook titled “AR Confirmation Simulation”
- A word document containing the Prior Year Workpapers
- The four templates which must accompany the simulation to generate audit evidence
- A PowerPoint introducing the assignment

To ensure that all functions within the Excel simulation workbook work correctly, students must enable macros because the Excel simulation uses them extensively. The simulation calls on the following *.html templates: TemplatePO.html creates purchase orders; TemplateBOL.html creates bills of lading; TemplateINV.html creates invoices; and TemplateConf.html creates confirmations and responses to confirmations. These template files must be in the same folder as the spreadsheet to function properly. Excel will not look to other folders for these templates.

Last year’s workpapers are included with the assignment for students to use as templates. This is consistent with practice, where auditors typically have access to the prior year’s workpapers

The PowerPoint file available on the website enables you to quickly demonstrate the assignment to students. We recommend using this presentation to introduce your students to the concepts covered in the simulation prior to them completing it. When demonstrating alternative procedures, you should be aware that the dollar amount on every purchase order and invoice always equals the book balance, and there is a bill of lading supporting every transaction. You shouldn’t tell this to your students, but this will allow you to demonstrate the assignment much more quickly as you will not need to read

Table 4

Case learning objectives linked with location within the simulation.

	Learning objectives	Simulation location
LO 1	Students complete the confirmation process	Student Guide: Section 2
LO 2	Students perform alternative procedures for unreturned confirmation requests	Student Guide: Section 3.23 Results Worksheet
LO 3	Students observe tangible examples of audit evidence	Summary Worksheet
LO 4	Students calculate sample size for confirmation testing	WP 1 – Sample Size Calculation
LO 5	Students exhibit an understanding of sampling risk	Student Guide: Section 3.3 WP 2 – Evaluation of Results
LO 6	Student form a conclusion and document their work in audit work papers	WP 3 – Summary of Testing

from the invoices, bills of lading or purchase orders. Each column of the results page of the simulation will auto-fill after students enter five responses. This was done to limit the amount of time students spend on this assignment.

4.5. Implementation guidance

We recommend this case be used in an undergraduate auditing class after discussions of AR confirmations and audit sampling. Many of the concepts covered regarding sampling require students to have taken a basic statistics course to fully grasp the information within the simulation. On average, the simulation takes one hour to complete, with the majority of the time spent reading the student instructions and completing audit work papers. This case works well as an in-class activity or out of class assignment.

To distribute this assignment to students, we upload the zip file “AR Confirmation Simulation – Student Version” to the learning management system. This zip file contains all the files that students will need to ensure the simulation functions correctly, as well as other supporting files needed to complete the simulation (Student Guide and Prior Year Workpapers). Ensure that you instruct students to extract all the files from the zip folder into a separate folder on their computer for proper functionality.

When opening the Excel workbook, you will notice that several of the tabs within the workbook are shaded green. These tabs are shaded to indicate which tabs in the workbook require student input. Note that for all “WP” tabs, students are required to add the basic headings and descriptions within text boxes, which they can mimic from the prior year work papers. Areas requiring student feedback contain red font indicating what the student is expected to enter into each cell. Descriptions of what students are expected to complete for each shaded tab follows.

WP 1 – Calculation of Sample Size – This work paper is used to calculate the sample size to be used in confirmation testing. While we have explained many of the inputs used in this calculation throughout the simulation, students may require a basic statistics course to fully grasp the formulas used to calculate sample size. We provide students a sampling plan based on the [AICPA Audit Guide: Audit Sampling](#) to assist them in understanding these concepts. You can find a copy of this handout in [Appendix A](#). It also addresses each of the issues raised in the sampling plan. We expect students to use Excel referencing and formulas to populate the cells requiring student input. This gives students the opportunity to sharpen their Excel skills while performing this simulation. Cells containing black font contain information provided to the student. After entering information into the required fields, Excel will automatically calculate the appropriate sample size using the formula from the prior year work paper. We have provided students both alpha and beta, but you may consider having students come up with their own levels of risk to increase the critical thinking elements of this simulation. Once students have calculated the sample size for confirmation testing, they should enter this amount into “C8” in the “Summary” worksheet.

WP 2 – Evaluation of Results – On this work paper, students use their sample results to conclude whether or not accounts receivable are materially overstated. The simulation helps students see how audit procedures generate evidence that becomes the basis for their conclusion. Auditing standards state:

For tests of details, the auditor is required by paragraph 530.13 to project misstatements observed in an audit sample to the population in order to obtain a likely misstatement. Due to sampling risk, this projection may not be sufficient to determine an amount to be recorded (ASB 2016 AU-C 530 A.24).

... the *projected misstatement* is the auditor's best estimate of misstatement in the population. As the projected misstatement approaches or exceeds tolerable misstatement, the more likely that actual misstatement in the population exceeds tolerable misstatement (ASB 2016 AU-C 530 A.27).

We require students to evaluate their results and determine if the amount by which their projected misstatement exceeds tolerable misstatement provides sufficient allowance for sampling risk. Although standards do not require that auditors evaluate sample results using statistics, statistics does help illustrate the relationship between the sample results and risk.

Similar to the previous work paper, students will enter the required inputs into the cells containing red text to calculate sampling risk and any potential overstatement. To complete some of the calculated fields, students will need to use Excel formulas for sum and standard deviation from information on the “Sample” tab. Note that this tab will not appear in the Excel workbook as it is generated by running the simulation. Students will be required to use the Excel formulas “=sum

(account balance from sample tab)” and “stdev.s(account balance from sample tab)” to obtain values required for this worksheet. After completing this work paper, students are required to conclude on the fair presentation of the accounts receivable balance.

WP 3 – Summary of Testing – This work paper is used by students to summarize the procedures they performed and to document their conclusions. We expect students to copy and paste the information from the prior year work paper into this worksheet and update it for the current year. This work paper helps students to understand the pivotal rule in auditing, “if it isn’t documented, it isn’t done”.

Summary – This worksheet is used to run the simulation. All aspects of this worksheet are explained using text boxes. Students are only required to input the sample size calculated in “WP 1 – Sample Size Calculation” and a four-digit student id to run the simulation. Note that the four-digit student id is used to select a unique sample of customers for each student to reduce any potential cheating activities. We have our students use the last four digits of their actual student id, but you could assign them a unique number as well. Links provided in the yellow and green boxes will open the students’ web browsers, allowing them to view the confirmation templates, returned confirmation requests, and supporting documentation to be used in alternative procedures.

Results – This worksheet is used by students to document the results of their testing procedures. Students will enter the balances from the returned confirmation requests into the appropriate column to detect any discrepancies. Also, students are expected to enter relevant information from the supporting documentation used in alternative procedures into the appropriate column. Note that students are only required to enter 5 items into each column and the remaining information will auto-populate. This is done to reduce the redundancy of this exercise.

In addition to the simulation portion of this exercise, we have also included critical thinking questions to assist students in developing a deeper understanding of the confirmation process. We recommend having students complete these questions in a separate word document. Requiring students to complete these questions will extend the time it takes to complete this simulation beyond one hour. We have included our suggested solutions to these questions in a separate section below.

It is important to note that many steps in the confirmation process are mechanical, leading to many aspects of the simulation being mechanical. These includes preparation and mailing of confirmations and agreeing information from a confirmation or supporting documentation with the information in the accounts receivable sub-ledger. Other aspects of the simulation are less mechanical, such as the calculation of sample size and the evaluation of sample results. We provide students with copies of the prior year work papers to guide them in completing the current year work papers for these audit procedures. We find it necessary to explain the role of the prior year’s work papers. Many students are concerned that merely updating last year’s work papers might be cheating or plagiarism. However, this is typical of an actual audit where staff auditors routinely rely on prior year work papers to complete the current year work. Consequently, we must continually warn students that circumstances change from year to year and they must be vigilant and not just blindly follow last year’s work papers.

Prior to using this exercise, confirmation was merely a vocabulary word which our students memorized. They had no basis to reflect on the process. A discrepancy between a recorded balance and a confirmation, or any audit discrepancy for that matter, was a vague concept students had difficulty visualizing. Completion of this exercise enables students to better reflect on the confirmation process and to visualize discrepancies.

You may want to explain the vouching procedure used to perform alternative procedures. We spend minimal time explaining the mechanics of the alternative procedures because our students have previously completed a project in which they vouched entries from a sales journal to invoices, shipping documents and sales orders.⁴ This allows us to focus our discussion on other aspects of the confirmation process.

When grading student submissions of this simulation we are not terribly concerned with how many mistakes students made on the assignment. We have provided a grading rubric ([Appendix B](#)) and can provide an answer key to the Excel file upon request. The real benefits of the project accrue in subsequent lectures because students have a tangible experience dealing with concepts of internal control, audit sampling, audit evidence, fraud and the confirmation process as a whole. You might consider using the critical thinking questions provided at the end of the simulation to provide a more in depth discussion of the confirmation process during lecture time. The following are some of our suggestions for discussing this simulation in a lecture.

4.5.1. Subsequent discussions of internal control

As the project is written, the audit team previously evaluated the internal controls to be effective and assessed control risk as low. However, the simulation is seeded with a large number of discrepancies, making it likely that all students will encounter discrepancies. This leads to discussions about the possible need to reassess control risk. We have included a critical thinking question addressing this concern.

We discuss possible causes of the observed discrepancies. Several reasons exist for possible discrepancies. For example, invoices may be sent to customers when a product has been ordered rather than shipped. Other discrepancies could include a sales return that is in transit near the year end date. The customer may remove this balance from their books. However, the client will not remove it until after year end when the items are physically returned. These cut-off issues are more likely to

⁴ Miller and Savage (2009).

result in discrepancies if they occur at or near the year end date. Other examples of overstatements in the simulation could result from: (1) billing customers for sales that did not occur, or at least for sales that had not occurred as of December 31st, (2) billing customers for more products than were actually shipped or billing at higher prices than those on the approved price list, (3) shipping more goods than the customer ordered, and (4) shipping products to customers who never ordered the products.

Finally, we discuss controls which might prevent such errors; controls such as having the shipping department verify that a customer purchase order exists for every shipment and that the quantity shipped agrees with the quantity ordered. In the billing department, controls should be in place to verify that a bill of lading exists before an invoice is created and also to agree the prices on the invoice with the official price list.

4.5.2. Subsequent discussions of accounts receivable and alternative procedures

Next, we take our previous discussion a bit further regarding conditions which might explain discrepancies between the recorded balance and a customer's response to the confirmation. We explain that auditors do not automatically accept the customer's response as correct. For such discrepancies, auditors perform alternative procedures by examining source documents to determine whether (1) the amount the customer confirmed, or (2) the client's recorded balance is correct. One method of auditing discrepancies is to vouch from the accounts receivable subsidiary ledger to the invoice, bill of lading and purchase order. This is an opportunity to reinforce that vouching to the invoice provides evidence the customer was billed for the recorded amount; the bill of lading provides evidence the goods were actually shipped to the customer, and the purchase order provides evidence the customer actually ordered the goods.

4.5.3. Subsequent discussions of audit sampling

In order to provide a framework to discuss the relationship between the quantity of evidence and the risk of an incorrect conclusion, we cover audit sampling early in the term. Later, when the text covers account receivable confirmations, we refer to the simulation and again discuss the evaluation of sample results. Because this comes toward the end of the term, we discuss possible implications of any material misstatements detected by our substantive procedures. We ask students to consider if it will be necessary to reassess control risk and extend our substantive tests.

We ask students to consider the assessments of alpha and beta provided in the simulation and judge their appropriateness. We ask students which type of risk, Type I or Type II, poses the largest risk to the audit. While we have no intention of turning the audit classroom into a statistics course, we find it important to relate statistical concepts to the auditing world so students can better understand their relationship.

4.5.4. Subsequent discussions of audit documentation

Our students have difficulty grasping the importance of good audit documentation. By including workpapers, the project exposes students to actual workpapers. We frame discussions regarding audit documentation in terms of litigation. In case they are ever required to defend their conclusion to a jury, we stress that their documentation may need to persuade a suspicious jury that they actually performed the procedures and obtained sufficient evidence. PCAOB inspection reports substantiate the need for proper documentation.

4.5.5. Subsequent discussions of fraud

If you want to discuss fraud in accounts receivable, students can read the article "Detecting Circular Cash Flow" in the *Journal of Accountancy* (Monhemius & Durkin, 2009). This article discusses how companies use receivables as collateral to obtain loans which may create incentive to inflate receivables. It also illustrates the limitations of confirmation procedures to detect sophisticated schemes used to inflate receivables. In addition, the article points out various red flags that may indicate fraudulent activities and helps students understand the need to be vigilant during the confirmation process.

4.6. Customizing the simulation

There are several ways you can customize this simulation to achieve your desired outcomes. Below are several ways to tailor the case:

- Remove the formulas in the Excel workbook for calculating sample size and sampling risk. Instead, have students create these formulas to test their Excel skills.
- Have students input their own alpha and beta levels and determine the appropriate Z-scores. Note that increasing or decreasing the sample size will not change the length of time it takes to complete the simulation due to the auto-populate functions.
- Require students to add tickmarks to the work papers to further document their work. Note that this will require you to cover these concepts during a lecture prior to assigning the simulation.
- Have students work in teams to give them the opportunity to ask each other questions regarding the concepts covered in the simulation.
- Have students present their responses to the critical thinking questions instead of writing them in a word document.

- You can add a time dimension to the project by assigning the simulation in stages. Students can complete the first four steps of the simulation, which involves the calculation of sample size and generation and mailing of the confirmation requests. To simulate the time lag between the mailing of the confirmations and responses, you could wait until the next class to assign further portions of the simulation.

4.7. AR confirmation discrepancies within the simulation

The simulation does not have a single solution. While the simulation always generates the same discrepancy for any given customer's confirmation response, the discrepancies do not flow through to the alternative procedures. None of the purchase orders, bills of lading or invoices contain discrepancies. The purchase orders, bills of lading and invoices are always consistent with the recorded book balances. The discrepancies a student receives will depend on the random sample generated by the simulation.

5. Efficacy of the simulation and feedback

We originally implemented this simulation in an undergraduate accounting class of 91 students of whom 75 successfully completed all portions of the simulation and answered the efficacy survey questionnaire. The survey included several questions measured on 100 point scale from 0 (Strongly Disagree) to 100 (Strongly Agree).

Students completing the simulation performed at a high level and were able to achieve strong outcomes on the simulation learnings objectives. We have summarized the results from this questionnaire by providing the average response for each question in Table 5.

While we received a lot of positive feedback from these students, several suggestions were provided by them that have since been added to the simulation. We also received a large amount of reviewer feedback resulting in many aspects of the simulation being changed to improve quality.

To determine if the changes to the case were effective at addressing the concerns raised by students and reviewers, we efficacy tested the case across two undergraduate auditing classes at two independent universities. Both classes were junior level undergraduate auditing classes and both universities are considered large state institutions. In addition, we changed our original efficacy questionnaire to obtain better measures of simulation effectiveness. We have summarized the results from these efficacy tests in Table 6 and Table 7.

The first class surveyed (University 1) was an under-graduate auditing class at a large state university. The class consisted of 24 students, of which 14 successfully completed all aspects of simulation and the efficacy questionnaire. The second class surveyed is a masters level auditing class at a large state university. The class consisted of 40 students, of which 29 successfully completed all aspects of the simulation and efficacy questionnaire. Both classes had covered the AR confirmation process in lecture prior to completing the simulation.

Table 6 summarizes student feedback from the simulation from both of these universities. This table reports students perceptions of knowledge before and after the simulation regarding the major concepts covered in the simulation. As anticipated, student's perceptions of knowledge increased a result of completing the simulation.

Table 7, measured students perceptions of the simulation and the various topics covered throughout. Overall, students agreed that the simulation enhanced their knowledge of the AR confirmation process. Measures for under-graduate students

Table 5
Measures of efficacy.

	Original sample
	n = 74
<i>Panel A: Answers to questions after case completion</i>	
The AR Confirmation simulation provided a more realistic auditing experience than is typical in an accounting class	83.1
I enjoyed completing the AR simulation	74.8
The AR Project complimented the text and enhanced my understanding of the accounts receivable confirmation process	82.3
The AR Project complimented the text and enhanced my understanding of what it means to perform alternate procedures for accounts receivable	81.7
The AR Project helped me better understand the nature of audit evidence	80.1
The AR Project helped clarify the relationship between audit evidence and auditors' conclusions regarding the fair presentation of account balances	76.3
I am more familiar with auditors' work papers because of the AR Project	82.3
I would learn more and be better prepared for an auditing career if I were exposed to more projects like the AR Project	86.4

Table 6
Measures of efficacy.

		University 1		University 2	
		Before case n = 15	After case n = 14	Before case n = 40	After case n = 29
<i>Perceptions of knowledge before and after case completion</i>					
Rate your current level of understanding of the accounts receivable confirmation process	Novice	64.29%	15.38%	28.21%	10.34%
	Adv. Beginner	21.43%	38.46%	20.51%	17.24%
	Competent	7.14%	38.46%	43.59%	48.28%
	Proficient	0.00%	7.69%	5.13%	24.14%
	Expert	7.14%	0.00%	2.56%	0.00%
	Average	1.64	2.38**	2.33	2.86**
Rate your current level of understanding of the procedures auditors use to calculate sample size	Novice	57.14%	15.38%	28.21%	3.45%
	Adv. Beginner	28.57%	38.46%	25.64%	27.59%
	Competent	7.14%	38.46%	25.64%	44.83%
	Proficient	0.00%	7.69%	17.95%	20.69%
	Expert	7.14%	0.00%	2.56%	3.45%
	Average	1.71	2.38**	2.41	2.93**
Rate your current level of understanding of the concept of sampling risk	Novice	64.29%	7.69%	28.21%	0.00%
	Adv. Beginner	28.57%	38.46%	30.77%	34.48%
	Competent	7.14%	38.46%	28.21%	44.83%
	Proficient	0.00%	15.38%	12.82%	20.69%
	Expert	0.00%	0.00%	0.00%	0.00%
	Average	1.43	2.62**	2.26	2.86**
Rate your current level of understanding of how auditors prepare audit work papers	Novice	35.71%	15.38%	15.38%	3.45%
	Adv. Beginner	42.86%	15.38%	33.33%	17.24%
	Competent	21.43%	61.54%	38.46%	51.72%
	Proficient	0.00%	7.69%	10.26%	27.59%
	Expert	0.00%	0.00%	2.56%	0.00%
	Average	1.86	2.62**	2.51	3.03**

Students answered the questions using a 5-point scale with the following descriptions:

1 = Strongly Agree

2 = Disagree

3 = Neutral

4 = Agree

5 = Strongly Agree

** Indicates that answers to pre- and post- assessments are significantly different at 1% levels (two-tailed), respectively.

Table 7
Measures of efficacy.

	University 1 Average answer n = 14	University 2 Average answer n = 29
<i>Answers to questions after case completion</i>		
The AR Confirmation simulation provided a more realistic auditing experience than is typical in an accounting class	4.00	3.72
The AR simulation was very challenging	3.27	3.75
The AR simulation increased my knowledge of the confirmation process	4.08	3.93
The AR simulation helped clarify the relationship between audit evidence and auditors conclusions regarding the fair presentation of account balances	3.77	3.88
I am more familiar with auditor's work papers because of the AR simulation	4.00	3.52
The AR simulation improved my understanding of the concept of sampling risk	3.62	3.62
I enjoyed completing the AR simulation	3.75	3.54

Students answered the questions using a 5-point scale with the following descriptions:

1 = Strongly Agree

2 = Disagree

3 = Neutral

4 = Agree

5 = Strongly Agree.

were slightly higher than masters level students as master's level students had more knowledge of the AR confirmation process prior to beginning the simulation.

Our efficacy measures provide support for the effectiveness of the simulation in enhancing knowledge of the AR confirmation process. The case also resulted in enhancing conversations of the topics covered during lecture where many students

expressed enjoyment in completing the simulation and stated that it provided them a realistic scenario to practice the concepts covered in class.

6. Suggested solution and grading rubric

An Excel answer key can be provided for the simulation at any time by contacting the authors. Authors are also willing to assist in the event you have any technical issues using the simulation in your class room. In the event you choose to grade the simulation, we have provided a grading rubric in [Appendix B](#).

Acknowledgements

We would like to thank our colleagues in the teaching profession for agreeing to implement our simulation in their classroom and provide suggestions for improvement. We are also immensely grateful to the editor and reviewers of this manuscript for their constructive feedback. Their collective efforts proved invaluable and greatly assisted us in creating a fun and insightful exercise.

Appendix A. Sampling plan (AICPA audit Guide: Audit Sampling)

The AICPA Audit Guide for audit sampling suggests the following questions be addressed when planning a sampling procedure.

“2.30 The following questions apply to planning any audit sampling procedure, whether it is nonstatistical or statistical:

- What is the test objective and relevant assertion? (What does the auditor want to learn or be able to infer about the population? What assertions are being tested?)
- What is the auditor looking for in the sample? (How is a misstatement or deviation defined?)
- What is to be sampled? (How is the population defined?)
- How is the population to be sampled? (What is the sampling plan, what is the sampling unit, and what is the method of selection?)
- How much is to be sampled? (What is the sample size?)
- What do the results mean? (How are the sample results evaluated and interpreted?)”

What is the test objective?	Determine whether the accounts receivable balance is materially overstated Materiality is defined as 10% of the accounts receivable balance
What assertions are being tested?	Existence; valuation
How is a misstatement defined?	When the audited value for a customer's account as determined by confirmation or alternative procedures does not agree with the amount recorded in the accounts receivable subsidiary ledger
How is the population defined?	All customer accounts included in the accounts receivable subledger, which has been agreed to the general ledger balance
What is the sampling unit?	Customer accounts in the accounts receivable subsidiary ledger
What is the sample size?	Must be determined
What is the method of selection?	Random sampling
	Send positive confirmations to selected customers Perform alternative procedures for customers who do not respond to confirmation requests
How are the sample results (to be) evaluated?	Perform a hypothesis test to statistically generalize the sample results to the accounts receivable balance
What do the results mean?	Conclude on whether the accounts receivable balance is materially overstated

Appendix B. Grading rubric for the simulation work papers.

1. Work papers are turn in on time	<input type="checkbox"/>
2. Each work paper includes the appropriate common information:	<input type="checkbox"/>
• client name, transaction cycle, account, nature of test, objective, assertions, and tolerable error	<input type="checkbox"/>
• sign-off and date should be updated for each work paper	<input type="checkbox"/>
3. Work paper 1:	<input type="checkbox"/>
• required sample size calculation reflect this year's population and risk parameters	<input type="checkbox"/>
4. Work paper 2:	<input type="checkbox"/>
• sum, mean, and standard deviation calculated from sample results	<input type="checkbox"/>
• projected error calculated from sample results	<input type="checkbox"/>
• the conclusion is appropriate for the potential misstatement	<input type="checkbox"/>
5. Work paper 3:	<input type="checkbox"/>
• sample size and dates in the procedure description are appropriate	<input type="checkbox"/>
• the conclusion is consistent with work paper 2	<input type="checkbox"/>

References

- AICPA Audit Sampling Guide Task Force. AICPA. Audit guide: Audit sampling, 2.30. New York: American Institute of Certified Public Accountants.
- Andiola, L. M., Lambert, T. A., & Lynch, E. J. (2018). Sprandel Inc: Electronic workpapers, audit documentation, and closing review notes in the audit of accounts receivable. *Issues in Accounting Education*, 33(2), 43–55.
- Ashbaugh, H., & Johnstone, K. M. (2000). Developing students' technical knowledge and professional skills: A sequence of short cases in intermediate financial accounting. *Issues in Accounting Education*, 15(1), 67–88.
- Auditing Standards Board (2016). *AU-C Section 505*. New York: American Institute of Certified Public Accountants.
- Auditing Standards Board (2016). *AU-C Section 530*. New York: American Institute of Certified Public Accountants.
- Bamber, E., & Bylinski, J. H. (1984). Attribute sampling: A review in light of SAS No. 39. *Journal of Accounting Education*, 2(1), 83–97.
- D'Aquila, J. M., & Capriotti, K. (2011). The SEC's case against California Micro Devices: A lesson in using professional skepticism and obtaining sufficient appropriate evidence. *Issues in Accounting Education*, 26(1), 145–154.
- Dickins, D., Fallatah, F., & Higgs, J. (2013). The importance of sample selection: An instructional resource using US presidential elections. *Journal of Accounting Education*, 31(1), 68–83.
- Dykxhoorn, H., & Sinning, K. (1984). The lack of uniformity in statistical audit sampling terminology. *Journal of Accounting Education*, 2(2), 153–161.
- Gifford, R., & Howe, H. (2012). Rosie's East End Restaurant: An experiential introduction to auditing. *Journal of Accounting Education*, 30(2), 207–219.
- Hogan, T. J., Bierstaker, J. L., & Seltz, W. E. (2001). Laborers local 829 health and welfare plan: Testing investments and receivables. *Issues in Accounting Education*, 16, 637–662.
- Miller, C., & Savage, A. (2009). Vouch and trace: A revenue recognition audit simulation. *Issues in Accounting Education*, 24(1), 93–103.
- Monhemius, J., & Durkin, K. (2009). Detecting circular cash flow Retrieved from. *Journal of Accountancy*, 208(6), 23–30 <http://www.journalofaccountancy.com/Issues/2009/Dec/20091793>.
- Paul, J. (1994). Explaining attributes-sampling concepts: A hypothesis-testing framework. *Journal of Accounting Education*, 12(1), 43–58.