Assets and Liabilities: When do they Exist?[*]

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Abstract

In this paper, we investigate whether the references to probability in standard setters' conceptual definitions of assets and liabilities cause individuals to believe that the probability of a future transfer of economic benefits must be above some meaningful threshold (or even, certain) for an asset or a liability to exist—a belief that is contrary to standard setters' intent. Results of multiple experiments indicate that the majority of individuals do use a high probability threshold to determine asset existence whereas, for liabilities, the majority use a very low threshold. Thus, even under *ceteris paribus* conditions, liabilities are more frequently identified than assets—a phenomenon consistent with conservatism on the balance sheet. We also provide evidence showing that standard setters' definitions are not the cause of this behavior, as individuals naturally use probability when making these existence decisions. Our findings also indicate that a simple definitional change, as proposed by the IASB in its recent Exposure Draft (2015a), leads more individuals to identify assets and liabilities in a manner that is more closely (but not perfectly) aligned with standard setters' goals. Our study provides important insights both for standard setters as they continue work on their mission to update their conceptual frameworks and for researchers regarding the role of conservatism for assets and liabilities.

Keywords: *conceptual framework, assets, liabilities, definitions, probability*

1. Introduction

Both the International Accounting Standards Board (IASB) and the Financial Accounting Standards Board (FASB) have long struggled with how to best define assets and liabilities—two fundamental elements of financial reports. The existing definitions include references to probability, and both boards have voiced concerns that the specific probability phrases used cause confusion about what criteria must be met for an asset or for a liability to exist (IASB 2015a; FASB 2016). Standard setters have made attempts to explain that the words *expected* (IASB) and *probable* (FASB) were included only to signal that economic activities occur in an uncertain environment and not to imply that assets and liabilities exist only when a future transfer of economic benefits is either certain or has a high probability of occurring (e.g., FASB and IASB 2007). These attempts have been largely ineffective, however, as evidenced by the issues raised in the IASB's current conceptual framework project (IASB 2015a).

The purpose of this paper is threefold. First, we investigate whether individuals naturally use probability in a way that deviates from standard setters' intentions when determining if an asset or if a liability exists. In doing so, we identify theoretical reasons for why individuals might judge assets differently from liabilities. Second, we examine whether the probability terms in the existing definitions cause individuals to misuse probability. Third, we provide evidence on whether standard setters' proposed changes to the definitions of assets and liabilities will better align individuals' existence decisions with standard setters' intentions.

Our study is important for several reasons. First, the conceptual framework is widely relied upon not only by standard setters, but also by other parties, including preparers, auditors, lawyers, and students.[1] If these parties do use probability to judge the existence of assets or of liabilities, it

[1] Specifically, in both US and international settings, preparers and their auditors use concept statements to understand and interpret existing standards. In international settings, International Accounting Standard No. 8 suggests that preparers and their auditors rely on the conceptual framework (which is part of international generally accepted accounting principles) to develop

follows that they will under-identify items that are indeed assets or liabilities. Indeed, standard setters have stated that the failure of constituents to identify as assets and liabilities those "items that are clearly assets and liabilities, such as written and purchased options, stand-ready obligations and insurance contracts" is the result of inappropriate consideration of probability (IASB 2015b, 36). Furthermore, if standard setters' concepts of assets or of liabilities differ from those of others who rely on the conceptual framework, then an understanding of this difference is a necessary step in determining how to make improvements (Bonner 1999). Although both boards have argued that their definitions cause individuals to inappropriately use probability as a determinant of whether an asset or a liability exists, it is possible that this attribution is misplaced. Instead, the problem could originate from how individuals naturally think about assets and liabilities independent of these definitions—a possibility we derive from psychology theory concerning individuals' reasoning in situations involving uncertainty (Konold 1989). By providing scholarly evidence on the role of these definitions versus individuals' natural reasoning processes, we provide insight into a problem that standard setters are currently facing.

Second, because of the perceived problem with how assets and liabilities are currently defined, international standard setters are now working to improve these definitions (IASB 2015a), with US standard setters not far behind (FASB 2016). Both boards believe that changing the relevant probability phrases will cause individuals to reduce the probability thresholds they use for asset and liability existence decisions—that is, to only require a *nonzero* probability of a future

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accounting policies when current standards do not address a particular transaction or event (IAS 8.11). Even though the conceptual framework is not considered part of generally accepted accounting principles in the US, auditors nevertheless refer to concept statements in those settings where the accounting treatment is unclear (Deloitte 2016). Lawyers also rely on the conceptual framework when filing class action complaints against firms for alleged inappropriate accounting (e.g., *State Treasurer of Michigan v. AIG* 2008; *Public Employees Retirement Association of Colorado and General Trading of Philadelphia v. Royal Ahold N.V. Securities & ERISA* 2004; *Cosmos Investment v. Bally Total Fitness Holding Corporation* 2004*)*. Finally, the conceptual framework is an important foundation for those learning about financial reporting (Kieso, Weygandt, and Warfield 2016).

benefit (sacrifice of benefits) for an asset (a liability) to exist, provided all other definitional criteria are met. By studying the effects of this proposed change before it is implemented, we provide timely *ex ante* empirical evidence to standard setters (Maines 1994; Schipper 1994).

We turn to psychology theory about how individuals deal with uncertainty to guide our predictions and research design. Our two primary experiments each entail a between-participants design in which we manipulate (1) the probability that a single two-party business transaction will result in a cash flow transfer, and (2) whether a definition of the relevant financial statement element is given and, if so, whether it is based on the existing or the proposed definition of that element. In Experiment 1, participants indicate whether an asset exists for a potential payee in a business transaction. In Experiment 2, we ask participants to view the same transaction from the potential payer's perspective and indicate whether a liability exists for this payer. We conduct three additional experiments to replicate key aspects of Experiments 1 and 2 and to rule out potential alternative explanations for our findings.

We rely on experimentation for several reasons (see Libby, Bloomfield, and Nelson 2002). First, through experimentation we can hold constant factors other than our manipulated variables that are important determinants of asset and liability existence decisions (e.g., whether an obligating event has occurred). Holding constant these factors would be more difficult with archival methods. Second, experimentation allows us to investigate the consequences associated with a potential change to the conceptual framework *before* the change is implemented, thereby providing standard setters with timely feedback about their ideas for change. Such investigations are generally not possible with other research approaches (Schipper 1994).

Our results provide a number of important insights. First, when judging the existence of assets, individuals use probability in a way that is inconsistent with standard setters' intent but that is consistent with psychology theory regarding how individuals reason under uncertainty. Specifically, we observe that individuals require the probability of a future benefit transfer to be

above some positive threshold (but do not require that it be certain) before indicating that an asset exists. Specifically, we find that a greater proportion of participants believe an asset exists when a business transaction has an 80% (versus a 20%) probability of ending in a cash transfer. Additional experimentation rules out the possibility that participants rely on either the expected value or the absolute magnitude of the future economic benefit to judge the existence of an asset.

We observe a different pattern of results for liabilities. Specifically, we find that judgments about the existence of a liability are not sensitive to whether a given business transaction has a 20% versus an 80% probability of ending in a cash transfer. Supplemental analyses suggest that a majority of our participants have probability thresholds below 1%. In a follow-up experiment, we show that this result is general and holds for different types of liabilities. That assets and liabilities are judged differently is consistent with psychology research that suggests individuals are more sensitive to negative (relative to positive) information (Rozin and Royzman 2001; Taylor 1991) and suggests a natural preference for conservatism.

Second, in both Experiments 1 and 2, participants who were given a definition based on standard setters' current conceptual framework made similar determinations about assets and liabilities as participants who were not given a definition. These results indicate that, contrary to the beliefs of standard setters, the probability terms in the existing definitions do not cause problems with respect to asset and liability existence decisions.

Third, we show that the proposed changes to the definitions of assets and liabilities—changes that attempt to clarify the role of probability—do systematically influence a meaningful number of individuals' beliefs about what is required for an asset or a liability to exist. That is, a greater percentage (although still less than 100 percent) of participants given the proposed wording in Experiment 1 (Experiment 2) indicated that an asset (a liability) exists, relative to participants given the existing wording. Although the proposed wording does not completely eradicate the problem, it does appear to lower a significant number of individuals' probability thresholds for

judging the existence of both assets and liabilities—consistent with standard setters' objective. Additional experimentation shows that this result holds even with experienced accountants.

Our study has several important implications. For standard setters, our results should be informative as we document that, while a majority of individuals reason in a way that is consistent with standard setters' intentions when judging liabilities, most reason in a manner consistent with standard setters' concerns when judging assets. Further, we document that this behavior is a result of individuals' natural reasoning processes and not a result of the definitions within the conceptual framework, as standard setters believe. Nevertheless, clarifying the language concerning probability, as standard setters propose, does help alleviate—although does not eliminate—individuals' misuse of probability for judgments about the existence of assets. This clarification also helps in the case of liabilities, as it changes the threshold for a portion of the minority of individuals who rely on a high threshold for their liability existence decisions.

For researchers, we add to the financial reporting literature in several ways. First, the existing research on the role of probability in financial reporting addresses how individuals differentially interpret probability phrases in the context of contingent liabilities (e.g., Jiambalvo and Wilner 1985). That setting is one where US standard setters have purposefully deviated from their conceptual definitions to achieve a desired accounting treatment, and so focuses on a different issue than we investigate herein.[2] We add to this literature by addressing, outside of the contingent liability context, whether and how individuals naturally use probability in their decisions about the existence of assets and liabilities (Botosan, Koonce, Ryan, Stone, and Wahlen 2005).

[2] Specifically, this research focuses on when to disclose versus recognize (i.e., make a journal entry for) a contingent liability. The contingent liability setting is one of the few cases where the FASB purposely requires a probability threshold for recognition, meaning that existence does not imply recognition. Our study does not focus on recognition *per se*; rather, we study the existence of an asset or a liability. The FASB's Concept Statement No. 5 supports that existence is a key determinant of recognition, with relevance, reliability, and measurability being the other determinants (FASB 2008).

Second, by documenting that individuals treat assets and liabilities asymmetrically, we also add to the financial reporting literature on conservatism (Basu 1997; Watts 2003a, b), which has predominantly viewed conservatism in terms of the performance statement (i.e., gains and losses). Our asset-liability asymmetry result is particularly striking given that we observe it in a setting without incentives or other conditions favoring conservatism *and* with a group of participants who, *ex ante*, arguably have no predisposition to display this tendency.

In the following section, we present background and develop our theoretical predictions. Section 3 describes our two primary experiments and Section 4 presents the associated experimental results. Section 5 describes three additional experiments related to our primary results. Section 6 summarizes and concludes the paper.

2. Background and theoretical development

Assets and liabilities: Existing and proposed definitions

Assets and liabilities are two of the most fundamental elements of financial reporting (Storey and Storey 1998). The IASB currently defines an asset as "a resource controlled by the entity as a result of past events and from which future economic benefits are expected to flow to the entity" and a liability as "a present obligation of the enterprise arising from past events, the settlement of which is expected to result in an outflow from the enterprise of resources embodying economic benefits" (IASB 2015a, 11). In a similar vein, the FASB currently defines assets as "probable future economic benefits obtained or controlled by a particular entity as a result of past transactions or events," and liabilities as "probable future sacrifices of economic benefits arising from present obligations of a particular entity to transfer assets or provide services to other entities in the future as a result of past transactions or events" (FASB 1985, 6). Note that both standard-setting bodies incorporate probability terms in their current definitions—the IASB uses the word *expected* and the FASB uses the word *probable*. The IASB has noted that its term *expected* is

similar to the FASB's term *probable* as both rely on the notion of likelihood (FASB and IASB 2005).

In recent remarks, the IASB and the FASB have noted that assets and liabilities exist when there is a present right or a present obligation, respectively, regardless of the probability that a future benefit or a future sacrifice of benefits will occur (FASB 2001, 2002a, b; FASB and IASB 2007; IASB 2015a).[3] Standard setters contend that (1) the insertion of probability phrases in their existing definitions was meant merely to highlight the fact that economic transactions occur in an environment characterized by uncertainty (FASB 1985), and (2) individuals misinterpret the existing definitions to mean that an asset (a liability) exists only when a benefit (sacrifice of benefits) has a high probability of occurring or is certain to occur (FASB and IASB 2007; IASB 2015a).

Because standard setters believe the source of the problem lies with the specific probability phrases in the conceptual definitions of assets and liabilities, they have proposed changes to the definitions of these fundamental financial statement elements. In particular, suggested definitions eliminate the words *expected* and *probable* and make it clearer that, in addition to meeting all other criteria, an asset must only have the "potential to produce economic benefits" (IASB 2015a, 40) and a liability must only have the "potential to require the entity to transfer an economic resource to another party" (IASB 2015a, 43). In essence, the proposed wording aims to lower the probability thresholds that individuals use when identifying assets and liabilities from some inexplicit positive probability to any nonzero probability.

[3] In 2004, the IASB and the FASB initiated a joint project to revise both Conceptual Frameworks for Financial Reporting. In 2010, both boards suspended work on that project to focus on other matters. Given feedback from constituents, the IASB resumed work on an IASB-only project, with the goal of improving financial reporting "by providing a more complete, clear and updated set of concepts" (IASB 2015a, 6). Although the FASB has not initiated a parallel project, they continue to discuss the definitions of assets and liabilities and their misinterpretations (FASB 2016).

Prior Research

Whether individuals are sensitive to variations in probability when judging the existence of assets or of liabilities, as now conjectured by standard setters, is an untested idea. Although some prior research appears similar to our study (e.g., Jiambalvo and Wilner 1985; Harrison and Tomassini 1989; Hackenbrack and Nelson 1996; Kinney and Nelson 1996), its purpose is fundamentally different. Specifically, the prior research investigates how auditors and preparers interpret the phrase *probable* within the context of contingent liabilities—a setting in which standard setters have purposely deviated from their conceptual definitions by specifying that for an event to be *probable*, there must be some high probability of it occurring. The objective in these studies is to determine the numerical equivalent that auditors and preparers generate for the phrase *probable* and to ascertain how that assessment differs from those for two other probability phrases in that standard—namely, *reasonably possible* and *remote* (FASB 1975). The general findings of this research are that substantial variation exists in the numerical equivalents of these probability phrases; it also shows that incentives and context can influence the interpretation of these various probability phrases (Aharony and Dotan 2004; Amer, Hackenbrack, and Nelson 1994; Harrison and Tomassini 1989; Raghunandan, Grimlund, and Schepanski 1991).

Our study differs from those above as we examine if and how individuals *naturally* use probability when judging the existence of assets or of liabilities, outside of the very-unique contingent liability domain. Further, we are not interested in quantifying the exact threshold that individuals have for their existence decisions. Rather, given our research questions, we are only interested in whether this threshold is greater than 1%, which would indicate behavior that is inconsistent with standard setters' intentions. Consistent with this literature, though, we do demonstrate that context can have an impact on individuals' behavior. Whereas the prior literature examines how decision-making role (e.g., auditor, preparer, etc.) influences the numerical equivalents for various probability phrases, we examine how the type of financial statement item

(i.e., asset versus liability) might be judged differently. We also provide evidence on how accounting experience might be influential in interpreting our results.

Theoretical development related to research questions

Below, we lay out our theoretical predictions for the three questions we investigate in this paper: (1) Do individuals naturally use probability in a way that deviates from standard setters' intentions when determining whether an asset exists or when determining whether a liability exists? Relatedly, are assets judged differently than liabilities? (2) Do the probability terms in the existing definitions of assets and of liabilities cause individuals to misuse probability? (3) Will standard setters' proposed definitional changes better align individuals' existence decisions with standard setters' intentions?

The role of probability when judging the existence of assets and of liabilities

We draw on psychology theory regarding how individuals deal with uncertainty (Kahneman and Tversky 1982) to investigate whether individuals use probability in a way that deviates from standard setters' intentions when determining if an asset or if a liability exists. In general, this research suggests that individuals are not good at probabilistic reasoning (Bernstein 1998) and, thus, often simplify a given task to render the required judgment (Kahneman and Frederick 2002). Interestingly, neither of the two possible ways that psychology theory predicts individuals will simplify probabilistic-reasoning tasks are consistent with how standard setters believe individuals *should* use probability when judging the existence of assets and of liabilities.

One way individuals may simplify tasks that involve uncertainty is to presume that an asset or a liability exists only when there is certainty (i.e., probability of 100%) about a future transfer of economic benefits. Standard setters have conjectured that individuals may require certainty before acknowledging assets and liabilities. Indeed, the original phrasing of the FASB's definitions did not include the word *probable*, but the word was added in response to various comment letters expressing concern that assets would only be thought to exist if a future benefit was certain

(Storey and Storey 1998). This view has theoretical support, as research shows that individuals tend to favor certainty (Kahneman and Tversky 1979; Slovic, Fischhoff, and Lichtenstein 1982) and will overweight outcomes that are certain relative to outcomes that are merely possible. The overweighting occurs because it is easier for individuals to think about situations involving certainty than about situations involving uncertainty (Dickhaut, Smith, Xin, and Rustichini 2003).

Another way in which individuals can simplify tasks that involve uncertainty is to use relative probability as a gauge for the existence of assets and liabilities. That is, individuals may have a high (but not 100%) probability threshold in mind when judging whether an asset or a liability exists. Essentially, individuals can simplify the problem by reasoning that some probabilities are "close enough" to certain, meaning they imply the outcome will occur (Konold 1989; Konold Pollatsek, Well, Lohmeier, and Lipson 1993). For example, when asked whether it will rain, some individuals interpret the statement "there is a 70% chance of rain" as the more definitive qualitative statement "it is going to rain" (Konold 1989). These individuals reason in this fashion because they view 70% as being above some personal threshold indicating close enough to 100%. This view implies that higher probabilities of a future transfer of an economic benefit would cause individuals to conclude that an asset and a liability exists, while lower probabilities of the same future benefit transfer would cause them to conclude that no asset or liability exists.

Not only is it unclear how individuals will use probability to judge the existence of assets and liabilities, as explained above, it is also not obvious whether the manner in which individuals reason about assets is similar to that for liabilities. On the one hand, symmetry has merit. From a psychological perspective, humans have a preference for symmetry—symmetric objects and people are judged to be more attractive, symmetric patterns are easier to process, and symmetry symbolizes a well-functioning organism or system (Reber, Schwarz, and Winkielman 2004; Rhodes 2006; Wagemans, Elder, Kubovy, Palmer, Peterson, Singh, and von der Heydt 2012). Further, for many two-party business transactions, an asset for one party logically leads to a

liability at the same point in time for the other party. Historically, standard setters have relied on this reasoning when writing accounting standards (FASB 2016).

On the other hand, because humans are more sensitive to negative (relative to positive) information (Rozin and Royzman 2001; Taylor 1991), it is possible that they attach greater importance to probabilities associated with outflows (relative to inflows) of economic benefits. Such views would result in the asymmetric identification of assets and liabilities. In other words, liabilities would be more frequently judged to exist than assets, even under *ceteris paribus* conditions. This perspective is consistent with accounting conservatism—i.e., the more timely recognition of losses relative to gains, which has been documented time and time again in the accounting literature (Basu 1997; Watts 2003a, b).

In sum, our first set of tests addresses two issues, both of which have competing underlying theories. First, do individuals rely on certainty or use relative probability to judge the existence of assets or the existence of liabilities? Next, do individuals judge assets and liabilities symmetrically or are they more likely to conclude that a liability exists?

Do the current definitions cause difficulties?

As noted earlier, standard setters have presumed that their use of the word *expected* or the word *probable* in the relevant conceptual framework has created problems with the identification of assets and liabilities. Indeed, they maintain that their reference to probability in these definitions causes individuals to believe that the probability of a future transfer of economic benefits must be above some meaningful threshold for an asset or for a liability to exist—a belief that is contrary to their intent.

Whether the words *expected* and *probable* in the existing definitions cause problems would be revealed by the behavior of individuals given versus not given these definitions. This revelation would be true regardless of how individuals use probability—that is, whether they require certainty or use relative probability when judging the existence of assets and liabilities. In short, if

individuals draw similar conclusions about the existence of an asset (or a liability) with and without a definition, then it logically follows that the definition cannot be the source of their existence conclusions. As an illustration, suppose individuals naturally use variations in probability to judge the existence of assets, with higher (lower) probabilities indicating an asset exists (does not exist). According to standard setters, this behavior is problematic. If providing the definition of an asset does not further exacerbate individuals' sensitivity to probability, then we would conclude that the definition does not contribute to the problem.

Will the proposed changes make a difference?

Standard setters are now contemplating a change to the conceptual definitions of assets and liabilities in an attempt to clarify the role of probability in the identification of these financial statement elements. Drawing on prior psychology research that investigates the perceived numerical equivalents of various probability terms, it follows that the term *potential* should imply a lower probability than the terms *expected* and *probable* imply (Wallsten and Budescu 1983; Wallsten, Budescu, Rapoport, Zwick, and Forsyth 1986; Zimmer 1983). Thus, if standard setters replace the current probability terms with the word *potential* (as they propose), the threshold level required for an asset or for a liability to exist arguably should decrease. Thus, if individuals attend to the proposed definition with its use of the word *potential*, then they should judge assets and liabilities to exist on a more frequent basis. This prediction should hold true regardless of whether individuals naturally require certainty or are naturally sensitive to variations in probability when judging asset and liability existence.

This prediction is not without tension, however, as there is no guarantee that individuals will attend to the proposed definition. Specifically, it is possible that judging the existence of assets and liabilities—either via requiring certainty or some high probability threshold—is hardwired behavior, thereby making it difficult to change (Arkes 1991). Thus, even if individuals are given a definition that assigns a lower threshold for existence, some or all may nevertheless continue to

use their natural probability thresholds in their decisions. Indeed, it may be difficult for individuals to undo behaviors that are fairly automatic. Accordingly, we examine the effectiveness of the proposed wording change for the conceptual definition of assets and liabilities.

3. Experiments 1 and 2 – design and method

Participants

Two hundred ninety-nine and 311 US-designated workers from Amazon.com's Mechanical Turk (MTurk) online marketplace completed Experiment 1 and Experiment 2, respectively. Fifty-three percent of participants were male and participants indicated having approximately eight years of full-time work experience, on average.[4] In exchange for completing our short study, we paid each participant a fixed wage of $0.50. Importantly, Farrell, Granier, and Leiby (2016) demonstrate that MTurk workers exert effort equal to or in excess of other populations when faced with accounting-research related tasks, regardless of the size of the monetary incentive.

Individuals from the general population of MTurk workers make appropriate participants for our study because we are interested in (1) how individuals intuitively understand assets and liabilities, and (2) how individuals respond to different definitions of assets and of liabilities without prior knowledge of any definitions or experience in accounting. Restricting our sample to a particular subset of individuals (e.g., highly experienced and knowledgeable accountants) would have resulted in a sample of participants with substantial prior knowledge about and experience in applying the definitions of the various financial statement elements we wish to better understand, thereby potentially biasing our results toward their prior knowledge. Specifically, individuals with strong prior accounting knowledge may subconsciously overweight their prior knowledge and underweight the experimental stimuli, thereby weakening our tests. In sum, we believe that the knowledge base of our participants matches the requirements of the task and the goals of our

[4] Study participants were not allowed to participate in more than one of our multiple experiments.

research (Libby, Bloomfield, and Nelson 2002).[5] Nevertheless, we did conduct additional experimentation using more experienced participants to test whether our results are sensitive to experience. We present this additional experimentation in Section 5.

Research design and procedures

Experiment 1 – Assets

We collected our asset data using a 2 × 3 (probability of future payoff occurring: high vs. low × definition of an asset: none vs. existing vs. proposed) between-participants experiment, which we conducted online using Qualtrics software. This experimental design allows us to simultaneously address three issues: (1) document whether individuals naturally use probability when identifying assets or when identifying liabilities, (2) identify whether the existing definitions of assets and liabilities cause individuals to misuse probability, as standard setters surmise, and (3) determine whether the proposed wording will remedy any misuse of probability we do observe.

Participants randomly assigned to either the Existing or Proposed Definition conditions began by learning a definition of an asset. Participants in the Existing Definition condition were told that "an item is an asset if it provides the company with a probable future economic benefit," whereas participants in the Proposed Definition condition were told that "an item is an asset if it provides the company with a potential future economic benefit." To ensure participants attended to our definition manipulation, we required them to accurately complete the sentence "An item is an asset if it provides the company with a _____" before moving on to the next phase of the study. Participants assigned to the No Definition condition did not receive a definition and did not complete the related comprehension check.

[5] Across those experiments where participants without accounting experience were purposefully chosen (i.e., Experiments 1, 2, 4, and 5), over 55 percent of our study participants have not taken any accounting courses, over 80 percent have no experience in an accounting job/function, and over 90 percent currently work in positions other than accounting. Various partitions of our data by number of accounting courses taken, amount of accounting work experience, and current position in accounting reveal that our results are not sensitive to low versus high levels of these demographic variables.

The next screen contained our experimental case. All participants learned of an existing contract between ABC Company and Master Miner Co., a precious stone mining company. The case stipulates that Master Miner is in the midst of searching for precious stones on the land it owns, and if the excavation is successful within the next nine months, Master Miner must pay $50,000 to ABC Company. We manipulated the probability of a future benefit by stating that it was either 80% likely or 20% likely that ABC Company will receive the payment from Master Miner.[6] In all conditions, ABC Company receives nothing if the project is unsuccessful.

On the same screen as the experimental case, participants indicated whether they would "consider the contract with Master Miner Co. to be an asset of ABC Company" (Yes or No) and indicated how confident they were in their assessment on a 101-point scale with endpoints labeled as *not at all confident* (0) and *very confident* (100).[7] For reference, the relevant definition of an asset (if any) was displayed at the top of the screen. On the following screens, participants assigned a value to the contract (between $0 and $50,000), wrote down what they remembered from the situation provided, answered manipulation check questions, and provided some demographic information.

Experiment 2 – Liabilities

Approximately one month after Experiment 1, we collected our liability data using a similarly structured between-participants experiment. Participants randomly assigned to either the Existing or Proposed Definition conditions began by learning a definition of a liability. Participants in the

[6] These probability levels were chosen based on two considerations. First, during pilot testing, 24 individuals were asked the following question "What is considered *probable* varies from company to company, what does *probable* mean to you?" Their answers ranged from 25% to 86%. The other consideration was our requirement that the probabilities be symmetrically distanced from the endpoints (e.g., 20% and 80%, 30% and 70%, etc.).

[7] We did not elicit the numeric thresholds associated with the word *probable* as doing so could have led to carryover effects (i.e., an early elicitation of the threshold could influence the later judgment about existence, or vice versa). To avoid this potential problem, we only asked the existence question as its responses are of primary interest. Further, eliciting a probability threshold would be difficult in the no definition condition where there is no reference to probability.

Existing Definition condition were told that "a company has a liability to the extent that it has a probable future sacrifice of economic benefits," whereas participants in the Proposed Definition condition were told "a company has a liability to the extent that it has a potential future sacrifice of economic benefits." To ensure participants attended to our definition manipulation, we required them to accurately complete the sentence "A company has a liability to the extent that it has a _____" before moving on to the next phase of the experiment. Participants assigned to the No Definition condition did not receive a definition and did not complete the related comprehension check.

The next screen contained our experimental case. As in Experiment 1, all participants learned of an existing contract between ABC Company and Master Miner Co., a precious stone mining company. The case again stipulates that Master Miner is in the midst of searching for precious stones on the land it owns and if the excavation is successful within the next nine months, Master Miner must pay $50,000 to ABC Company. We again manipulated the probability of a future benefit transfer occurring by stating that it was either 80% likely or 20% likely that Master Miner will have to make a payment to ABC Company. In all conditions, Master Miner pays out nothing if the project is unsuccessful.

On the same screen as the experimental case, participants indicated whether they would "consider the contract with ABC Company to be a liability of Master Miner Co." (Yes or No) and indicated how confident they were in their assessment on a 101-point point scale. On the following screens, participants assigned a value to the contract (between -$50,000 and $0) and answered the same subsequent questions as in Experiment 1.

4. Results and discussion

Manipulation checks

To assess the effectiveness of the probability manipulation, we asked participants to indicate how likely it was that ABC Company would earn $50,000 as a result of its contract with Master

Miner in Experiment 1 and how likely it was that Master Miner Co. would pay out $50,000 as a result of its contract with ABC Company in Experiment 2. Ninety-four and 85 percent of participants correctly answered this question in Experiments 1 and 2, respectively. For both Experiments 1 and 2, the responses are significantly associated with the probability manipulation (both $\chi^2 > 266.52$; both $p < 0.01$) and not significantly associated with either the definition manipulation or the interaction of both manipulated variables (all $\chi^2 < 4.18$; all $p > 0.12$).

To assess the effectiveness of the definition manipulation, we asked participants to indicate the definition they were told to use for the purpose of this case or to indicate that they were not provided with a definition. Eighty-seven and 85 percent of participants correctly answered this manipulation check in Experiments 1 and 2, respectively. For both Experiments 1 and 2, the responses are significantly associated with the definition manipulation (both $\chi^2 > 626.21$; both $p < 0.01$) and not associated with either the probability manipulation or the interaction of both manipulated variables (all $\chi^2 < 2.95$; all $p > 0.09$).

In sum, both manipulations were successful, as intended. Thus, we use all available participants in the analyses that follow. All reported analyses produce inferentially identical results when conducted using only participants who passed both manipulation checks.

Experimental Results

Our primary dependent variables are participants' yes/no decisions about whether the contract between ABC Company and Master Miner Co. represents an asset of ABC Company (Experiment 1) or a liability of Master Miner Co. (Experiment 2).

Tables 1 and 2 present the results of Experiments 1 and 2, respectively. Specifically, Panel A of each table reports the descriptive statistics for the relevant primary dependent variable—namely, the proportion of participants in each experimental condition who indicated that they consider the contract to be an asset of ABC Company (Table 1) or consider the contract to be a liability of Master Miner Co. (Table 2). Figures 1 and 2 plot these proportions by experimental

condition. Panels B and C of each table show the categorical modeling results, along with relevant follow-up simple main effect tests.[8]

< TABLE 1, TABLE 2, FIGURE 1, AND FIGURE 2 >

How do individuals naturally use probability?

Our first set of tests examines: (1) whether individuals naturally use probability in a way that deviates from standard setters' intentions when determining if an asset or if a liability exists, and (2) whether individuals judge assets and liabilities symmetrically or are more likely to conclude that a liability exists. We rely on individuals' intuitive assessments of existence to inform these two questions. Thus, we focus on the No Definition conditions—presented in the first column of data in Panel A of Table 1 and in the first column of data of Panel A of Table 2.

First, our results indicate that individuals use relative probability to judge the existence of assets—behavior that is contrary to standard setters' intentions. Specifically, when participants are not given a definition of an asset, those in the 80% Probability condition were significantly more likely to consider the contract an asset (87.3 percent answered yes) than participants in the 20% Probability condition (36.5 percent answered yes). As shown in the simple main effect test of Panel B of Table 1, this comparison is statistically significant ($\chi^2 = 24.89$; $p < 0.01$). This result suggests that individuals naturally rely on probability when judging whether an asset exists.

Results of Experiment 2 suggest a different pattern of results for liabilities. Specifically, for liabilities, individuals do not distinguish between these two levels of probability. When participants are not given a definition of a liability, those in the 80% Probability condition are no more likely to consider the contract a liability (65.5 percent answered yes) than those in the 20%

[8] We also asked participants about their confidence in their asset/liability decisions. This measure was elicited on a 101-point scale with endpoints labeled as *not at all confident* (0) and *very confident* (100). We took this measure and combined it with participants' yes/no decision about the existence of an asset (or liability). Specifically, when participants answered yes (no) to the decision about existence, we multiplied their confidence score by 1 (-1), thereby creating a -100 to 100 continuous measure, which captures confidence in light of the decision made. All of the analyses that follow are robust to the use of this alternate measure of existence.

Probability condition (60.3 percent answered yes). As shown in Panel B of Table 2, this simple main effect comparison is not statistically significant ($\chi^2 = 0.32$; $p = 0.57$). Moreover, this relatively high proportion of yes responses suggests that, for the majority of individuals, the natural threshold for believing an uncertain event leads to a liability appears to fall below 20%. Still, for a minority of individuals—roughly 35 percent in our sample—this threshold is still quite high (above 80%).

Because we had considered the possibility that individuals may asymmetrically view assets and liabilities (i.e., judge liabilities to exist more frequently than assets, even under *ceteris paribus* conditions), we also collected data for a 1% Probability condition in our Experiment 2. We collected this data at the same time as the 20% and 80% Probability conditions of this second experiment, effectively creating a 3 × 3 between-participants experiment. Comparing the 1% and 20% Probability conditions (within the No Definition condition) allows us to ascertain whether a significant proportion of individuals have natural thresholds for liabilities that fall somewhere between 1% and 20%.

Results reveal that 61.5 percent of participants without a definition still considered the contract a liability when it had a mere 1% chance of resulting in the same $50,000 benefit transfer (untabulated). Interestingly, this proportion is not statistically different from the proportion of participants considering the contract a liability when there was either an 80% probability ($\chi^2 = 0.18$; $p = 0.67$, untabulated) or a 20% probability of a transfer ($\chi^2 = 0.02$; $p = 0.90$, untabulated). These additional results suggest that the majority of individuals rely on a probability threshold that is below 1% for determining whether a liability exists, which is consistent with standard setters' intentions.

Finally, these results (including the supplementary 1% data) support the theory that individuals hold asymmetric views of assets and liabilities.[9] Although it should be interpreted with caution given that Experiments 1 and 2 were not conducted at the same time, a statistical test interacting probability (i.e., probability of a future benefit transfer of 20% vs. 80%) and financial statement element (i.e., assets for Experiment 1 and liabilities for Experiment 2) shows that there is a statistically significant interaction for *Probability* and *Asset/Liability* ($\chi^2 = 12.78$; $p < 0.01$, untabulated).[10] This interaction further supports our interpretation of the results from the two experiments—namely, that whether individuals' existence decisions are naturally affected by variations in probability depends on the context of whether the item of interest constitutes a potential benefit (an asset) or a potential sacrifice of benefits (a liability).

Do the current definitions cause difficulties?

Our second set of tests examines whether the probability terms in the existing definitions cause individuals to misuse probability when identifying assets and liabilities. If individuals draw similar conclusions about the existence of an asset (a liability) with and without a definition, then it logically follows that the definition cannot be the source of their conclusions about whether or not an asset (a liability) exists. For this set of tests, we focus on four cells from each 2 × 3 design—specifically, we focus on the intersection of the two Probability conditions (20% and 80%) and the No Definition and Existing Definition conditions. Using these relevant data (the first two columns of data in each Panel A descriptive statistics of Tables 1 and 2), we estimate a categorical model with our dichotomous dependent variable and our two independent variables for

[9] Although our primary focus is on individuals' decisions about the existence of assets and liabilities, we also asked participants about the value they would assign to the contract (for exploratory purposes). Providing additional support for the perceived asymmetry between assets and liabilities, we find that more participants chose fair value in the asset setting (32 percent) than in the liability setting (11 percent) ($\chi^2 = 31.31$; $p < 0.01$) (cf. Koonce, Nelson, and Shakespeare 2011).

[10] Experiments 1 and 2 were conducted several weeks apart and, so, participants are not randomly assigned across financial statement element conditions. Nevertheless, we are comforted by the fact that our two populations do not vary significantly on demographic characteristics.

each experiment. Panel B of Table 1 (assets) and Panel B of Table 2 (liabilities) report the results of these 2 × 2 analyses.

Turning first to the results for assets, we see that our results indicate no main effect of *Definition* ($\chi^2 = 1.66$; $p = 0.20$) and no interaction effect of *Definition* and *Probability* ($\chi^2 = 1.27$; $p = 0.26$), which is consistent with the existing definition of an asset having no incremental impact over individuals' natural use of probability. We do observe a main effect of *Probability* ($\chi^2 = 41.82$; $p < 0.01$), however, and follow-up simple effects tests show that this main effect is strong within both the No Definition condition (as reported previously) and the Existing Definition condition. For the latter, a greater percentage of individuals considered the contract to be an asset in the 80% Probability condition (95.5 percent) than in the 20% Probability condition (38.3 percent). This follow-up simple main effect is statistically significant ($\chi^2 = 20.20$; $p < 0.01$). Together, these results suggest that individuals (a) require a future benefit to have a relatively high probability (i.e., >20%) of occurring before concluding that an asset exists, and (b) are not systematically affected by the existing definition of an asset (which uses the word *probable*) when drawing this conclusion.

Turning next to the results for liabilities, our results indicate no main effect of *Definition* ($\chi^2 = 0.69$; $p = 0.40$) and no interaction effect of *Definition* and *Probability* ($\chi^2 = 0.01$; $p = 0.93$), as in the case of the asset results just discussed. In contrast to the asset results, we do not observe a significant main effect of *Probability* ($\chi^2 = 0.42$; $p = 0.52$). Despite this difference, these results are consistent with the existing definition of a liability having no incremental impact over individuals' natural use of probability. That is, our prior test showed that *Probability* did not influence individuals' intuitive liability existence decisions and the follow-up simple effect test for the Existing Definition condition, as shown in Panel B, reveals the same pattern. Specifically, participants in the 80% Probability condition were no more likely to consider the contract a liability than participants in the 20% Probability condition (70.2 percent vs. 66.7 percent; $\chi^2 =$

0.14; $p = 0.71$). Together, these results suggest that individuals (a) do *not* require a future sacrifice of benefits to have a relatively high probability of occurring before concluding that a liability exists, and (b) are not systematically affected by the existing definition of a liability (which uses the word *probable*) when drawing this conclusion.

Will the proposed changes make a difference?

Our third set of tests investigates whether replacing the word *probable* with the word *potential* in both the asset and liability definitions will lower individuals' probability thresholds for determining whether a transaction leads to an asset or whether a transaction leads to a liability. For this prediction to hold for assets (liabilities), individuals should be more likely to consider a particular benefit an asset (a particular sacrifice of benefits a liability) when given the proposed definition than when given the existing definition.

For these tests, we again focus on four cells from each 2 × 3 design—namely, the intersection of the two Probability conditions (20% and 80%) and the Existing Definition and Proposed Definition conditions. Using these relevant data (the second and third columns of data in each Panel A descriptive statistics of Tables 1 and 2), we estimate a categorical model for each experiment with our dichotomous dependent variable and our two independent variables, as noted above. Panel C of Table 1 (assets) and Panel C of Table 2 (liabilities) report the results of these 2 × 2 analyses.

Turning first to the results for assets, Table 1 reveals no main effect of *Definition* ($\chi^2 = 1.99$; $p = 0.16$), a main effect of *Probability* ($\chi^2 = 23.31$; $p < 0.01$), and an interaction effect of *Definition* and *Probability* ($\chi^2 = 3.74$; $p = 0.05$). The latter interaction indicates that the relation between probability levels and participants' decisions depends on the definition they are asked to employ. The simple effect tests (also reported in Panel C) show that, although participants in the 80% Probability/Proposed Definition condition are no more likely to consider the contract an asset than participants in the 80% Probability/Existing Definition condition (94.1 percent vs. 95.5 percent; χ^2

= 0.08; $p = 0.77$), participants in the 20% Probability/Proposed Definition condition *are* significantly more likely to consider the contract an asset than participants in the 20% Probability/Existing Definition condition (78.0 percent vs. 38.3 percent; $\chi^2 = 14.70$; $p < 0.01$). In other words, the definitional change appears to have had a dramatic effect at the lower probability level (20%), but does not appear to have had an effect at the higher probability level (80%).

This result not only suggests that the proposed wording is likely to affect the frequency with which transactions are judged as involving assets (as posited by standard setters), but also that a significant proportion of individuals have a natural threshold for asset existence between 20% and 80%. With a threshold between 20% and 80%, individuals given an 80% probability of a contract leading to a cash inflow already consider the contract to be an asset under the existing definition, while individuals given a 20% probability do not. Thus, by moving the probability threshold down (via the proposed wording), a greater potential exists for a decision change in the 20% Probability condition. Overall, these results suggest that the proposed wording change will better align individuals' asset existence decisions with standard setters' intentions.

Now turning to the results for liabilities, Table 2 reveals a main effect of *Definition* (79.6 percent vs. 68.4 percent; $\chi^2 = 3.64$; $p = 0.06$), no main effect of *Probability* ($\chi^2 = 1.60$; $p = 0.21$), and no interaction effect of *Definition* and *Probability* ($\chi^2 = 0.61$; $p = 0.43$). Because we did not observe a difference between the 20% and 80% Probability conditions in the Existing Definition conditions (see prior results), it follows that we are unlikely to observe an interaction effect here when testing the proposed wording conditions. If the proposed wording affects a significant proportion of individuals' probability thresholds for liabilities, we should observe a statistical main effect for only the definition variable. As noted above, this is consistent with our results. This result suggests that for the minority of participants with probability thresholds for liabilities greater than 80%, a significant number reduce that probability threshold when given the proposed definition.

5. Additional experimentation

We conducted several additional experiments to test the generality of our findings and to rule out potential alternative explanations. Below we summarize each of these additional experiments along with the associated results.

Experiment 3: The role of accounting experience

In our first two experiments, we purposely drew on a participant pool that did not have extensive accounting experience. We did so, in part, to test the incremental effect of the existing definitions (which use the word *probable*) on individuals' natural asset and liability existence decisions. Conducting this test with experienced accountants would be troublesome as they would already have knowledge of the current definition, thereby making any test involving the No Definition condition largely meaningless. However, we can test the robustness of the existing/ proposed definition results with a more-experienced group of participants to ensure that our inferences are generalizable to those with accounting experience.

In Experiment 3, we recruited 187 participants with at least three years of accounting experience from the MTurk population. These participants completed the asset case used in Experiment 1. Because we are interested in (1) whether experienced accountants also rely on probability when judging the existence of assets, and (2) the effect of the proposed definition on these judgments, we again varied the probability of a future cash inflow to ABC Company (20% or 80%) as well as the definition of an asset (Existing or Proposed). Table 3 reports the proportion of participants in each experimental condition who considered the contract to be an asset of ABC Company (Panel A) and the related statistical analyses (Panel B).

< TABLE 3 >

Results reveal a main effect of *Probability* ($\chi^2 = 40.37$; $p < 0.01$), no main effect of *Definition* ($\chi^2 = 1.67$; $p = 0.20$), and an interaction effect of *Probability* and *Definition* ($\chi^2 = 4.05$; $p = 0.04$). Follow-up simple effects tests reveal that the effect of *Definition* is significant when the

probability of a future cash flow is 20% ($\chi^2 = 10.50$; $p < 0.01$) but not when it is 80% ($\chi^2 = 0.17$; $p = 0.68$). These simple effects indicate that the experienced accountants in the 80% Probability condition are unaffected by the proposed definition, as they already consider the contract to be an asset when applying the existing definition. In contrast, the experienced accountants in the 20% Probability condition are more likely to judge that an asset exists when given the proposed definition than when given the existing definition. These results are fully consistent with our findings in Experiment 1, indicating that those results hold even with experienced accountants.[11]

Experiment 4: Probability vs. expected value vs. potential payment amount

When judging the existence of an asset in Experiment 1, it is possible that participants relied on the expected value of the contract and not on the probability with which the contract would result in a cash transfer. This possibility exists because the potential payment amount is held constant in that experiment, thereby creating an expected value of $10,000 in the 20% Probability condition and $40,000 in the 80% Probability condition. In the fourth experiment, we rule out this possibility and also address whether individuals are sensitive to the potential payment amount when judging the existence of assets.

For Experiment 4, 199 participants from the same population as in Experiments 1 and 2 completed the (No Definition condition) case from Experiment 1. We again vary the probability of a future cash inflow (20% or 80%), but now vary the potential payment amount stated in the contract ($50,000 or $200,000). Table 4 reports the proportion of participants in each experimental condition who indicated that they consider the contract to be an asset (Panel A) and the related statistical analyses (Panel B). Results replicate our Experiment 1 findings as they show a main

[11] As a further test of whether accounting experience modifies our inferences, we also completed a large-sample pilot study where we directly compared individuals with and without accounting experience. In that study, all participants received the existing definition of an asset, and we manipulated the probability associated with a future benefit (i.e., 20% or 80%). Results suggest no differences in responses depending on experience; that is, both experienced and inexperienced participant-groups relied on a probability threshold between 20% and 80%, again indicating the generalizability of our results to experienced accountants.

effect of *Probability* (91.9 percent versus 34.0 percent; $\chi^2 = 51.68$; $p < 0.01$). Follow-up simple effects tests show this result holds regardless of the contract's potential payment amount (both $\chi^2 > 24.75$; both $p < 0.01$).

< TABLE 4 >

Most central to this fourth experiment, though, are the following two tests. First, we hold constant the expected value of the contract and compare the responses between the 80% Probability/$50,000 and 20% Probability/$200,000 conditions (i.e., the off-diagonal cells). If participants are relying on expected value and not on probability, then there should be *no* difference in their asset existence decisions between these two conditions. Second, we hold constant probability and compare responses between the two payment conditions ($50,000 and $200,000) as these conditions create different expected values (20% creates $10,000 and $40,000, respectively, and 80% creates $40,000 and $160,000, respectively). If participants take a cue from either expected value or from the total payment amount, then there *should* be differences in their asset existence decisions between the two payment conditions for a given probability level.

For the first test, we observe a difference between participants' asset existence decisions across the two off-diagonal conditions (94.2 percent versus 34.6 percent; $\chi^2 = 26.8$; $p < 0.01$), which vary on probability but not on expected value, indicating that individuals indeed rely on probability when judging the existence of assets. Results for the second test rule out expected value (as well as the potential payment amount) as contributors to the observed effect, as the proportion of participants who judged an asset to exist was not significantly different between the two conditions where both the expected value and the total payment amount differed (20%: $\chi^2 = 0.02$; $p = 0.89$; 80%: $\chi^2 = 0.77$; $p = 0.38$). This result is also confirmed by the overall main effect of Payment Amount (65.0 percent versus 65.9 percent; $\chi^2 = 0.49$; $p = 0.49$). Thus, our fourth experiment confirms that probability is driving our results and that neither the contract's expected value nor its payment amount influence individuals' asset existence decisions.

Experiment 5: Robustness of liability results

The fifth experiment again focuses on liabilities, but relies on a different type of transaction. This design enables us to test the generality of the finding that variations in probability do not appear to matter for liabilities. Recall that the case scenario used in Experiment 2 was the mirror image of that used in Experiment 1 for assets. However, in Experiment 5, we tested a liability case scenario based on a financial guarantee. Specifically, the scenario described a company that had promised to guarantee the bank loan of another company and to make a future payment (of $50,000) in the event of default by the other company. We again manipulated the probability of a future payout at three levels—1%, 20%, or 80%—and asked participants to indicate whether they believed a liability existed. Participants of Experiment 5 were from the same population as the participants of Experiments 1, 2, and 4.

As shown in Table 5, the fifth experiment reveals a pattern of results similar to those previously reported in our discussion of Experiment 2. Specifically, we observed no statistically significant differences between liability existence decisions for the three probability levels (χ^2 = 1.30; p = 0.52). This result occurred despite the success of the manipulation as revealed by the manipulation check question, indicating that participants appropriately took note of the probability condition to which they were assigned (χ^2 = 53.57; $p < 0.01$).[12] Overall, our fifth experiment suggests the generality of our conclusions about probability and liabilities.

< TABLE 5 >

[12] This scenario is one for which there is prescribed accounting for its treatment (i.e., FIN 45 (ASC 460) requires financial guarantees to be initially recorded at fair value). Because our participant population has little to no accounting experience, we did not anticipate that they would be familiar with this standard (nor with SFAS 5 (ASC 450) on contingencies). In the post-experimental questionnaire, we asked participants about their familiarity with these two standards, using a 101-point scale (0 *Not at All Familiar* and 100 *Very Familiar*). Responses show very low familiarity (average response around 7.0). Additional analyses show that familiarity cannot explain our results.

6. Conclusion

We conduct multiple experiments to investigate three issues: (1) Do individuals naturally use probability in a way that deviates from standard setters' intentions when determining whether an asset exists or when determining whether a liability exists? Relatedly, are assets judged differently than liabilities? (2) Do the probability terms in the existing definitions of assets and of liabilities cause individuals to misuse probability? (3) Will standard setters' proposed definitional changes better align individuals' existence decisions with standard setters' intentions?

Results of our experiments suggest that, counter to the IASB's and FASB's stated objectives, there is a significant proportion of individuals whose existence decisions are based on variations in probability. Interestingly, though, we document that this threshold differs between assets and liabilities. That is, even under *ceteris paribus* conditions, liabilities are more frequently identified than assets—suggesting that accounting conservatism occurs even when the income statement *per se* (i.e., gains and losses) is not the central construct under investigation. We also document that this behavior is not caused by the existing definitions of assets and liabilities, but by individuals naturally relying on probability in their decisions. Finally, both for assets and for liabilities, participants provided with the IASB's proposed definition made asset and liability decisions that were more closely (but not perfectly) aligned with standard setters' goals than participants provided with an existing definition.

While we believe our study provides useful input to standard setters and general insights into financial reporting, it nevertheless is subject to limitations. For example, we provided our study participants with numerical probabilities regarding the probability of a future economic benefit (or a sacrifice of an economic benefit). In many real-world situations, such probabilities are not available and must be inferred from the available data. The extent to which our results generalize to such settings should be the subject of future research. Further, our experimental instrument was designed to be relatively straightforward on assessing the probability of a future benefit transfer.

That is, we told participants that there were only two outcomes: a positive cash flow (with either 20% or 80% probability) or no cash flow (with either 80% or 20% probability). While this design allows us to cleanly investigate the role of probability in identifying whether assets and liabilities exist, it is fairly stylized and arguably not representative of many real-world situations. Finally, our results show that the IASB's proposed change to the conceptual framework (i.e., use of the word *potential*) is not a perfect solution, as some participants still did not act in accordance with standard setters' intentions. Our study does not investigate an alternative definition—namely, one that might make it more obvious that an asset (a liability) only needs to have "a nonzero probability" of a future economic benefit (sacrifice of benefits) to exist. Future research could investigate this idea. In sum, despite potential limitations, we believe our study provides timely and scholarly insights into how individuals judge the existence of assets and liabilities.

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FIGURE 1

Experiment 1 – observed effects of probability and definition on participants' asset existence decisions

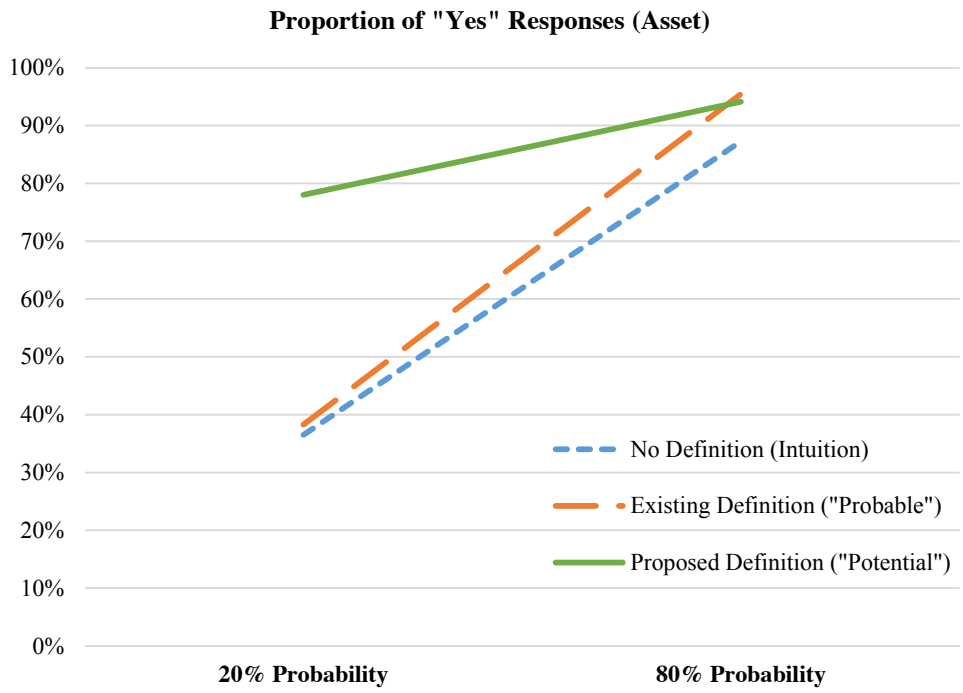

Figure 1 illustrates the proportion of participants in each experimental condition who considered the contract to be an asset of ABC Company (as reported in Table 1, Panel A). In Experiment 1, we randomly assigned participants to one of three definition conditions: No Definition, Existing Definition, or Proposed Definition. We also randomly assigned participants to conditions where the probability that a given contract will result in a cash flow transfer is either 80% or 20% likely. Participants then indicated whether they would consider this contract to be an asset of ABC Company (Yes or No).

F I G U R E 2

Experiment 2 – observed effects of probability and definition on participants' liability existence decisions

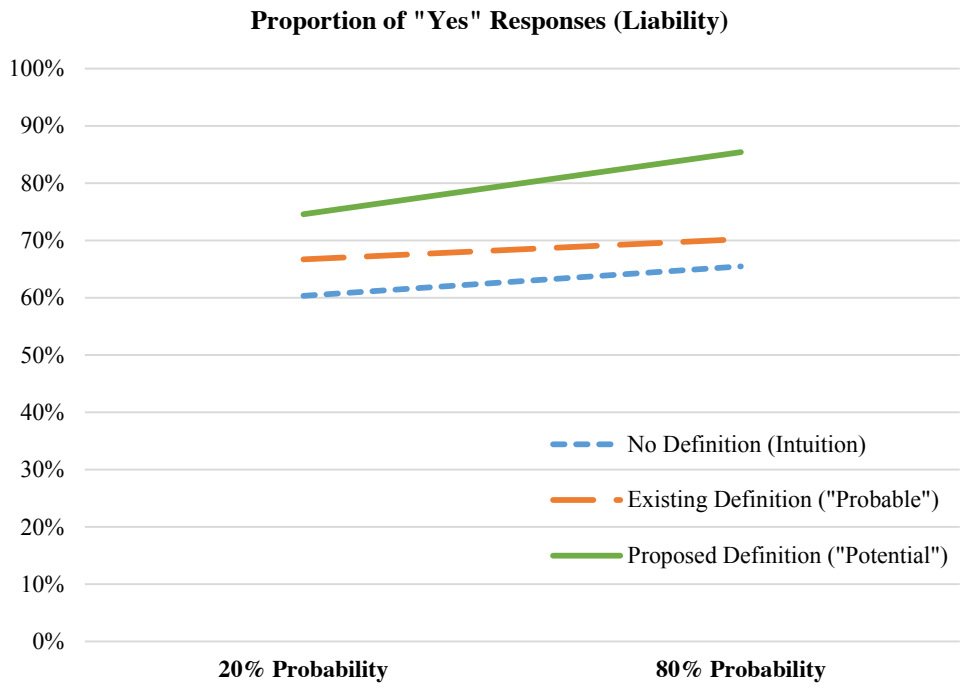

Figure 2 illustrates the proportion of participants in each experimental condition who considered the contract to be a liability of Master Miner Co. (as reported in Table 2, Panel A). In Experiment 2, we randomly assigned participants to one of three definition conditions: No Definition, Existing Definition, or Proposed Definition. We also randomly assigned participants to conditions where the probability that a given contract will result in a cash flow transfer is either 80% or 20% likely. Participants then indicated whether they would consider that contract to be a liability of Master Miner Co. (Yes or No).

T A B L E 1

Experiment 1 Results – Asset Existence Decisions

Panel A: Descriptive Statistics – percentage of participants who consider the contract an asset

	Definition			
Probability	No Definition (Intuition)	Existing (Probable)	Proposed (Potential)	Row
20% Probability of Project Success	36.5% (19/52)	38.3% (18/47)	78.0% (39/50)	51.0% (76/149)
80% Probability of Project Success	87.3% (48/55)	95.5% (42/44)	94.1% (48/51)	92.0% (138/150)
Column	62.6% (67/107)	65.9% (60/91)	86.1% (87/101)	

Panel B: Categorical Modeling Statistics for Yes, the contract is an asset – No Definition (Intuition) vs. Existing Definition (Probable)

Source	**Chi-Square Statistic**	***df***	**Two-Tailed p-value**
Definition (Existing vs. No Definition)	1.66	1	0.20
Probability	41.82	1	<0.01
Definition x *Probability*	1.27	1	0.26
Related Simple Effects Tests			
Effect of *Probability* given No Definition	24.89	1	<0.01
Effect of *Probability* given Existing	20.20	1	<0.01

Panel C: Categorical Modeling Statistics for Yes, the contract is an asset – Existing (Probable) vs. Proposed (Potential)

Source	**Chi-Square Statistic**	**df**	**Two-Tailed p-value**
Definition (Existing vs. Proposed)	1.99	1	0.16
Probability	23.31	1	<0.01
Definition x *Probability*	3.74	1	0.05
Related Simple Effects Tests			
Existing vs. Proposed given 20% Probability	14.70	1	<0.01
Existing vs. Proposed given 80% Probability	0.08	1	0.77

Table 1 presents the results of Experiment 1. In Experiment 1, we randomly assigned participants to one of three definition conditions: No Definition, Existing Definition, or Proposed Definition. We also randomly assigned the probability that a given contract will result in a cash flow transfer (either 80% or 20% likely).

Panel A reports the descriptive statistics for the proportion of participants in each experimental condition who indicated that they consider the contract to be an asset of ABC Company. Panels B and C report the applicable categorical modeling analyses.

T A B L E 2

Experiment 2 Results – Liability Existence Decisions

Panel A: Descriptive Statistics – percentage of participants who consider the contract a liability

	Definition			
Probability	No Definition (Intuition)	Existing (Probable)	Proposed (Potential)	Row
20% Probability of Project Success	60.3% (35/58)	66.7% (32/48)	74.5% (41/55)	67.1% (108/161)
80% Probability of Project Success	65.5% (36/55)	70.2% (33/47)	85.4% (41/48)	73.3% (110/150)
Column	62.8% (71/113)	68.4% (65/95)	79.6% (82/103)	

Panel B: Categorical Modeling Statistics for Yes, the contract is a liability – No Definition (Intuition) vs. Existing (Probable)

Source	**Chi-Square Statistic**	***df***	**Two-Tailed p-value**
Definition (No Definition vs. Existing)	0.69	1	0.40
Probability	0.42	1	0.52
Definition x *Probability*	0.01	1	0.93
Related Simple Effects Tests			
Effect of *Probability* given No Definition	0.32	1	0.57
Effect of *Probability* given Existing	0.14	1	0.71

Panel C: Categorical Modeling Statistics for Yes, the contract is a liability – Existing (Probable) vs. Proposed (Potential)

Source	**Chi-Square Statistic**	**df**	**Two-Tailed p-value**
Definition (Existing vs. Proposed)	3.64	1	0.06
Probability	1.60	1	0.21
Definition x *Probability*	0.61	1	0.43
Related Simple Effects Tests			
Existing vs. Proposed given 20% Probability	0.77	1	0.38
Existing vs. Proposed given 80% Probability	3.08	1	0.08

Table 2 presents the results of Experiment 2. In Experiment 2, we randomly assigned participants to one of three definition conditions: No Definition, Existing Definition, or Proposed Definition. We also randomly assigned the probability that a given contract will result in a cash flow transfer (either 80% or 20% likely).

Panel A reports the descriptive statistics for the proportion of participants in each experimental condition who indicated that they consider the contract to be a liability of Master Miner. Panels B and C report the applicable categorical modeling analyses.

T A B L E 3

Experiment 3 Results – Asset Existence Decisions for Participants with Accounting Experience

Panel A: Experiment 3 Descriptive Statistics – percentage of participants who consider the contract an asset

	Definition		
Probability	Existing (Probable)	Proposed (Potential)	Row
20% Probability of Project Success	25.0% (10/40)	60.4% (29/48)	44.3% (39/88)
80% Probability of Project Success	94.0% (47/50)	91.8% (45/49)	92.9% (92/99)
Column	63.3% (57/90)	76.3% (74/97)	

Panel B: Experiment 3 Categorical Modeling Statistics for Yes, the contract is an asset

Source	**Chi-Square Statistic**	***df***	**Two-Tailed p-value**
Definition (Existing vs. Proposed)	1.67	1	0.20
Probability	40.37	1	<0.01
Definition x *Probability*	4.05	1	0.04
Related Simple Effects Tests			
Existing vs. Proposed given 20% Probability	10.50	1	<0.01
Existing vs. Proposed given 80% Probability	0.17	1	0.68

Table 3 presents the results of Experiment 3. In Experiment 3, we randomly assigned participants with at least three years of experience in an accounting job or function to adopt either the Existing or the Proposed Definition. We also randomly assigned the probability that a given contract will result in a cash flow transfer (either 80% or 20% likely).

Panel A reports the descriptive statistics for the proportion of experienced participants in each experimental condition who indicated that they consider the contract to be an asset. Panel B reports the appropriate categorical modeling analyses.

T A B L E 4

Experiment 4 Results – Probability vs. Expected Value vs. Payment Amount

Panel A: Experiment 4 Descriptive Statistics – percentage of participants who consider the contract an asset

	Payment Amount in Contract		
Probability	$50,000	$200,000	Row
20% Probability of Project Success	33.3% (16/48)	34.6% (18/52)	34.0% (34/100)
80% Probability of Project Success	94.2% (49/52)	89.4% (42/47)	91.9% (91/99)
Column	65.0% (65/100)	65.9% (60/99)	

Panel B: Experiment 4 Categorical Modeling Statistics for Yes, the contract is an asset

Source	**Chi-Square Statistic**	***df***	**Two-Tailed p-value**
Payment Amount	0.49	1	0.49
Probability	51.68	1	<0.01
Payment Amount x *Probability*	0.69	1	0.41
Related Simple Effects Tests			
Effect of *Probability* given expected value of $40,000 (34.6% versus 94.2%)	26.8	1	<0.01
$50,000 vs. $200,000 given 20% Probability	0.02	1	0.89
$50,000 vs. $200,000 given 80% Probability	0.77	1	0.38

Table 4 presents the results of Experiment 4. In Experiment 4, we randomly assigned participants to one of two dollar magnitude of future cash inflow conditions: $50,000 cash inflow or $200,000 cash inflow. We also randomly assigned the probability that the contract will result in a cash flow transfer (either 80% or 20% likely).

Panel A reports the descriptive statistics for the proportion of participants in each experimental condition who indicated that they consider the contract to be an asset. Panel B reports the appropriate categorical modeling analyses.

T A B L E 5

Experiment 5 Results – Do Results Generalize to a Financial Guarantee?

Panel A: Experiment 5 Descriptive Statistics – percentage of participants who consider the agreement a liability

Probability		
1% Probability of Payout	20% Probability of Payout	80% Probability of Payout
81.1% (43/53)	84.0% (42/50)	89.4% (42/47)

Panel B: Experiment 5 Categorical Modeling Statistics for Yes, the agreement is a liability

Source	**Chi-Square Statistic**	***df***	**Two-Tailed p-value**
Probability	1.30	2	0.52

Table 5 presents the results of Experiment 5. In Experiment 5, we randomly assigned participants to one of three probability conditions (1%, 20%, or 80%).

Panel A reports the descriptive statistics for the proportion of participants in each experimental condition who indicated that they consider the agreement to be a liability. Panel B reports the appropriate categorical modeling analyses.