

MERGER ANTITRUST LAW

LAW 1469
Georgetown University Law Center
Fall 2026

Tuesdays and Thursdays, 3:30 pm – 5:30 pm
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CLASS 8 WRITTEN ASSIGNMENT—INSTRUCTOR’S ANSWER

Instructions

Submit by email by 3:30 pm on Thursday, September 17
Send to wdc30@georgetown.edu
Subject line: Merger Antitrust Law: Assignment for Class 8

Assignment

A. *Financial questions*: Calls for short answers in short paragraphs that the average person can understand. Math is neither required nor desired.

Company A wants to acquire 100% of Company B through a negotiated merger. The proposed plan of merger calls for Company A to pay cash to Company B’s shareholders as consideration for their interests in Company B. Company B is a widely held Delaware corporation that only issues common stock. Company B’s stock is traded on the New York Stock Exchange. Assume that the acquisition will be effected through a conventional one-step merger that requires approval by Company B’s shareholders.

1. Explain what is meant by Company B’s “market capitalization.”
2. Explain why Company A generally will have to pay a premium above Company B’s unaffected market capitalization in order to acquire Company B. (There are two reasons.)
3. Explain how Company A will determine the maximum price per share it would be willing to pay for Company B’s stock.
4. Explain how Company B might try to bargain with Company A for a high purchase price.
5. Once the two companies have reached an agreement on price and signed a definitive merger agreement, explain how another company can make a competing bid for Company B and under what circumstances Company B’s board can consider that bid and ultimately accept it. What can the competing bidder do if Company B’s board refuses to engage?

B. *Aon/WTW*:¹ Calls for a prediction supported by a financial analysis. *The date is July 15, 2021.*

I encourage you to work in groups on this problem.

On March 9, 2020, Aon and Willis Towers Watson (WTW), the second- and third-largest of the “Big Three” insurance brokers, announced their intention to combine in an all-stock transaction.

¹ This is a real matter and I have taken the facts in this problem from company reports and court documents. If you are interested in more on this case, see [Aon/Willis Towers Watson](http://www.appliedantitrust.com) in Unit 14 on AppliedAntitrust.com for additional materials. Although this is a merger, think of Aon as the buyer and WTW as the seller (since WTW shareholders get a premium).

Under the merger agreement, WTW shareholders will receive 1.08 Aon shares for each Willis Towers Watson share and will hold 37% of the stock in the combined company after closing. At Aon's March 6, 2020, unaffected closing share price, the Aon shares to be issued had an aggregate value of approximately \$30 billion, representing a 16.2% premium to WTW's closing share price on March 6, 2020. For purposes of this problem, assume that Aon's and WTW's unaffected standalone going concern equity values are \$51.08 billion and \$25.82 billion, respectively, and that these standalone values would remain unchanged through the assumed closing if the transaction did not occur. Do not assume that the Aon shares issued to WTW shareholders will have a market value of \$30 billion at closing. Instead, assume that, absent merger synergies, the combined company's equity value at closing would equal the sum of Aon's and WTW's standalone equity values, and that any net merger synergies you value would increase the combined company's equity value. Legacy WTW shareholders will own 37% of the combined company and legacy Aon shareholders will own 63%.

The companies expect that the transaction will yield annual pre-tax synergies of \$267 million in the first full year, \$600 million in the second full year, and \$800 million in the third full year and thereafter. They also anticipate \$1.4 billion in integration costs to achieve these expected synergies: approximately \$700 million in the first year, \$490 million in the second year, and \$210 million in the third year. The companies also expect transaction costs of approximately \$200 million and retention costs of up to \$400 million. The retention costs are expected to be spread evenly over the first three years following completion. For purposes of this problem, assume that the \$200 million in transaction costs are paid in the first year after closing. For purposes of this problem, assume that the combined company will have an effective tax rate of 20%, that the synergy gains are taxable as realized, and that the integration, transaction, and retention costs are fully deductible when incurred. In its investor presentation at the time of the deal's announcement, Aon stated that it anticipates "over \$10 billion of expected shareholder value, from the capitalized value of expected pre-tax synergies and net of expected one-time transaction, retention and integration costs."²

The drop-dead date for the deal is September 9, 2021. If the deal does not close for antitrust reasons, Aon must pay WTW an antitrust reverse termination fee of \$1 billion.

The transaction is subject to review by the United States and the European Commission.³ The European Commission approved the deal with conditions (divestitures) on July 9, 2021. Given that the EC review is suspensory, the deal could not have closed before receiving EU approval. In setting their strategy, the parties assumed that the EC-required divestitures, perhaps with some additional divestitures that would be acceptable to the parties, would be sufficient to satisfy the Department of Justice and enable the parties to close under a consent decree.

The parties were wrong. The DOJ refused to accept the additional divestitures offered by the parties to settle the investigation. On June 16, 2021, the Department of Justice filed a Section 7 complaint in the United States District Court for the District of Columbia. The parties say that

² Aon plc & Willis Towers Watson, [Investor Presentation: Combination of Aon and Willis Towers Watson: Creating a Next Generation Global Professional Services Firm](#) 6 (Mar. 9, 2020).

³ It is also subject to review in a variety of other jurisdictions, including Australia, Canada, New Zealand, Singapore, and South Africa. The merging parties claim, and you should assume here, that these other jurisdictions will clear the deal by September 9 either finding no competitive concerns with the deal or accepting a fix offered by the companies.

the divestitures required by the European Commission plus the additional divestitures they offered negate all Section 7 concerns about the deal and that they intend to litigate the fix.

The case was assigned to Judge Reggie Walton. Citing the drop-dead date of September 9, the merging parties asked Judge Walton to begin the trial on August 23 or as soon thereafter as possible (suggesting implicitly that the parties would extend the drop-dead date for at least a short period of time beyond September 9). The DOJ responded with a proposed trial date of February 28, 2022, a little more than six months later than the date proposed by the merging parties and a little more than eight months after the filing of the complaint. On July 9, Judge Walton set the trial dates for November 18, 2021, to November 23, 2021, and from December 20, 2021, to December 22, 2021, for a total of seven trial days. Judge Walton, presumably recognizing that the DOJ's proposed schedule would delay trial until more than eight months after the filing of the complaint, explained that the November and December dates were the earliest times he had available given the criminal trials already scheduled involving prosecutions in connection with the January 6 insurrection.

The date is July 15, 2021. You are advising an arbitrageur. The arb wants to know whether you think WTW will exercise its unilateral right to terminate the merger agreement on the September 9 drop-dead date and take the \$1 billion reverse termination fee or instead agree to extend the termination date until the trial court issues a decision (most likely in February 2022). For purposes of the financial analysis, assume that the court issues its decision five months after the September 9 drop-dead date. If the parties prevail, assume that the transaction closes at that time. If they lose, assume that the merger agreement terminates and WTW receives the \$1 billion reverse termination fee at that time. Assume that it will cost WTW \$10 million in out-of-pocket expenses for its part in the litigation beyond the drop-dead date. The companies have not announced how the divestitures required by the EC or offered to the United States will affect the synergies expected from the transaction. [GuruFocus.com](https://www.gurufocus.com) reported that on July 15, 2021, WTW's weighted average cost of capital (WACC) was 5.16% and its return on invested capital (ROIC) was 3.19%.

Bonus question: Should Aon agree to extend the drop-dead date in order to litigate, or should it terminate the deal on September 9 and pay WTW the \$1 billion reverse termination fee? Assume that Aon will pay \$15 million in out-of-pocket expenses for its part in the litigation beyond the drop-dead date. [GuruFocus.com](https://www.gurufocus.com) reported that on July 15, 2021, Aon's weighted average cost of capital (WACC) was 5.8% and its return on invested capital (ROIC) was 8.47%.

For purposes of the financial analysis of both problems, use the following assumptions so that we will all be working from the same assumptions:

- (1) Value the merger-created synergy stream over a 10-year horizon beginning with the first full year after closing.
- (2) Discount the annual net synergy cash flows to the closing date at an 8% annual discount rate.
- (3) Assume that WTW suffers no additional diminution in standalone going-concern equity value during the five-month extension beyond the September 9 drop-dead date.
- (4) For five-month timing adjustments, use a monthly discount rate equal to the applicable annual WACC divided by 12.
- (5) Do not discount the stated post-drop-dead litigation expenses.

State any additional assumptions you make in performing your financial analysis.

Send me an email if you have any questions. See you in class.

INSTRUCTOR'S ANSWER

A. Financial questions

1. Explain what is meant by Company B's "market capitalization."

Market capitalization is the aggregate market value of a company's outstanding common stock, calculated by multiplying the number of outstanding shares in each class by the trading price for shares of that class and summing the results.⁴ For example, if Company B has one class of common stock, 100,000 shares outstanding, and a trading price of \$76 per share, then Company B's market capitalization is 100,000 times \$76, or \$7,600,000. A company's market capitalization rises and falls with its stock price and with the number of shares outstanding.

Two points matter for the questions that follow. Market capitalization measures the value of the equity alone and does not include the company's debt, so it is not a measure of the value of the business as a whole. And it is built from a trading price at which only small parcels of stock change hands, which is not the price at which the entire company can be bought.

2. Explain why Company A generally will have to pay a premium above Company B's unaffected market capitalization in order to acquire Company B. (There are two reasons.)

First, shareholders do not all value their shares alike. The trading price of a company's shares is the price at which marginal buyers and sellers are willing to trade relatively small quantities of stock, so it tells us only what the marginal shareholder will accept. Other shareholders have higher reservation prices, some because they expect the stock to be worth more later and some for reasons that have nothing to do with value, such as the capital gains tax a low-basis holder would owe on a sale. Arrayed from lowest to highest, those reservation prices trace an upward-sloping supply curve for Company B's stock, and the price needed to acquire the whole company therefore exceeds the price needed to buy a small block. In a merger, however, Company A need not satisfy every shareholder on that curve. It must satisfy the *pivotal voter*, the holder whose vote carries the merger. Once the board approves the merger and the requisite vote is obtained, the merger binds every shareholder, and a shareholder who objects cannot keep her stock; her remedy is to dissent and seek appraisal.⁵ She cannot hold out, as she could in a tender offer. But the

⁴ Authorized shares are the maximum number of shares a corporation may issue under its certificate of incorporation. Issued shares are shares the corporation has issued. Outstanding shares are issued shares currently held by stockholders, excluding shares held by the corporation as treasury shares.

⁵ A shareholder who does not vote for the merger, demands appraisal in writing beforehand, and holds her shares through closing may ask the Court of Chancery to fix the fair value of her shares, payable in cash with interest in place of the merger consideration. Del. Code Ann. tit. 8, § 262. Appraisal is ordinarily unavailable for stock listed on a national securities exchange, on the theory that a shareholder who objects to the price can simply sell. But that limitation does not apply when the merger agreement requires shareholders to accept something other than publicly traded stock. Company B's shareholders therefore have appraisal rights here, because Company A is paying cash. *Id.* § 262(b)(1)–(2). Fair value is the value of the company as a going concern, determined "exclusive

pivotal voter's reservation price ordinarily lies above the marginal trading price, and that gap alone requires Company A to pay more than Company B's unaffected market capitalization.

Second, and for a separate reason, Company A will want to buy Company B only if Company A believes that Company B will be more valuable in Company A's hands than Company B is worth on a standalone basis. The difference is the "gains from trade" created by Company A acquiring Company B. If Company B can block the sale,⁶ then Company B can bargain for a portion of these gains from trade in the form of higher consideration to be paid to Company B's shareholders. This bargaining leverage will require Company A to pay more than the unaffected market price for Company B's shares.

The two reasons operate at different points. The first sets a floor below which no merger can be approved at all. The second determines how much of the value the merger creates Company B's shareholders capture above that floor.

The difference between the price Company A pays to acquire a share of Company B and the unaffected trading price is called the *premium per share*.⁷ The aggregate amount of this premium Company A will have to pay is the *premium over market capitalization*.

3. Explain how Company A will determine the maximum price per share it would be willing to pay for Company B's stock.

As explained above, Company A will be willing to acquire Company B only if Company A believes that Company B will be more valuable in Company A's hands. Company A's maximum total purchase price—its *reservation price*—is the amount that would leave Company A indifferent between acquiring Company B and pursuing its next best alternative. That amount is Company A's estimate of Company B's standalone equity value plus the present value of the net gains Company A expects the combination to produce, after the costs of achieving them. The maximum price per share is that amount divided by Company B's fully diluted shares, not merely its outstanding shares, because Company A must also pay for in-the-money options and other securities convertible into stock. Note that Company B's market capitalization is at best a proxy for its standalone equity value: it may already reflect the market's anticipation that Company B will be acquired, and it is in any event a price for small parcels rather than for the company as a whole.

of any element of value arising from the accomplishment or expectation of the merger," *id.* § 262(h), so appraisal captures no part of the gains the merger creates. The Delaware Supreme Court has accordingly directed that merger synergies be subtracted from the deal price in arriving at fair value. *Verition P's Master Fund Ltd. v. Aruba Networks, Inc.*, 210 A.3d 128, 141-42 (Del. 2019). Nor is the deal price a floor: the Court has affirmed an award resting solely on the target's unaffected market price, roughly 18 percent below the consideration the dissenters gave up. *Fir Tree Value Master Fund, LP v. Jarden Corp.*, 236 A.3d 313 (Del. 2020).

⁶ In the case where Company B is the wholly owned subsidiary of Company C, Company C can simply refuse to sell unless Company A gives Company C some of the gains from trade created by Company A's acquisition of Company B. In the case of a widely held public company, Company B's board can prevent a negotiated merger from proceeding by refusing to approve it, subject to the board's fiduciary duties.

⁷ "Unaffected" here means the price at which the stock would be trading if there was no information in the market that Company A wanted to buy Company B.

For example, if Company B has 100,000 fully diluted shares and a current market capitalization of \$7,600,000, Company A believes this accurately reflects Company B's standalone value, and Company A expects the acquisition to yield \$400,000 in present value of net gains after the costs of achieving them, then Company A would be willing at most to pay \$8,000,000 for Company B, or \$80 per share.

4. Explain how Company B might try to bargain with Company A for a high purchase price.

The preceding question explains why Company B can command a premium. This question asks how Company B goes about getting one. Company B's leverage is its power to withhold consent, and its task in the negotiation is to persuade Company A that it will use that power unless it is paid more. Because the price will fall somewhere between Company B's standalone value and Company A's maximum, Company B is trying to move the bargain toward the top of that range.

Company B will therefore work to raise Company A's estimate of what Company B is worth standing alone, and to convince Company A that the gains from the combination are large enough to support a higher price. It can present its own discounted cash flow analysis and business plan in support of a high standalone value, and it can make remaining independent look like a genuine alternative rather than a bluff. Because Company A knows more than Company B does about the gains Company A expects, Company B will also look to outside evidence of what those gains might be, including its own estimate of the available synergies and the premiums paid in comparable transactions.

Most powerfully, if other potential buyers for Company B exist, Company B can play Company A and the other potential buyers off against each other and thereby obtain a higher price. Company B need not wait for a rival to appear. It can solicit one, by running an auction or a market check before signing, or by negotiating a go-shop period afterward during which it may actively seek competing offers. Assuming Company A has the highest willingness to pay for Company B, competition among the bidders should enable Company B to bargain for a purchase price just above the second-highest bidder's maximum willingness to pay, since at that price no rival can profitably top the bid.

Bargaining is not costless. Company B cannot observe how much Company A is actually prepared to pay. If Company B overestimates that figure and holds out for more, Company A may walk away, and Company B's shareholders will lose the premium they could have had.

5. Once the two companies have reached an agreement on price and signed a definitive merger agreement, explain how another company can make a competing bid for Company B and under what circumstances Company B's board can consider that bid and ultimately accept it. What can the competing bidder do if Company B's board refuses to engage?

Because Company B is a Delaware public corporation and its shareholders are being cashed out, Company B's board is in *Revlon* mode and must seek the best value reasonably available for its shareholders. But *Revlon* does not create a fiduciary out from a signed contract. The merger agreement is a binding contract, and the board cannot disregard it simply because a better offer has appeared. In negotiating the agreement, the board therefore ordinarily preserves effective contractual flexibility to respond to a

superior proposal, typically through a no-shop provision qualified by a fiduciary out. A competing bidder can begin by taking an unsolicited proposal to Company B's board. Merely offering a higher price does not automatically entitle the bidder to negotiations; the proposal must satisfy the contractual threshold. Typically, if Company B's board determines in good faith that the proposal constitutes, or would reasonably be expected to lead to, a superior proposal, the fiduciary out permits the board to furnish information and negotiate with the bidder. If the competing proposal becomes superior, the agreement ordinarily permits the board to change its recommendation to Company B's shareholders. The agreement also often permits Company B to terminate the original agreement and enter into the superior transaction, subject to notice and matching rights and usually payment of a termination fee.

A board that decides to engage ordinarily will condition the delivery of nonpublic information on a confidentiality agreement. That agreement may contain a *standstill provision* restricting the bidder from buying shares, commencing a tender offer, or otherwise taking its proposal directly to the shareholders without target-board approval. If a standstill is required, the competing bidder faces a choice: conduct diligence and accept the standstill, or preserve the hostile option and work from public information alone.

The bidder is not limited to that contractual route. Unless a standstill binds it, the bidder can take its proposal directly to the shareholders and can solicit proxies against the pending merger. A tender offer is unlikely to succeed on its own if Company B has a rights plan, or poison pill, which would make the purchase prohibitively dilutive unless the board redeems it. The bidder's practical route is therefore to defeat the merger at the shareholder vote, or to run a proxy contest to replace the directors who will not redeem. Because this is a one-step merger, the transaction cannot be completed without the approval of Company B's shareholders. If the shareholders vote the merger down, it cannot be completed, and the agreement ordinarily permits either party to terminate. That is also why Delaware law does not invariably require the merger agreement to give Company B a termination right: a change-of-recommendation right may be sufficient so long as Company B's shareholders remain free to reject the merger.

B. Aon/WTW⁸

The question is whether, as of the September 9, 2021, drop-dead date, WTW is better off (1) terminating the merger agreement and receiving the \$1 billion antitrust reverse termination fee (ARTF) immediately or (2) extending the drop-dead date for five months and litigating. Because the cash consequences of the two choices occur at different times, compare all payoffs in present discounted value (PDV) as of September 9.

Strategy

The easiest way to solve this problem is to turn the narrative into a simple decision tree. Do not begin by trying to calculate an expected value. First identify the choices available to WTW and determine what each possible outcome would be worth. Only after those payoffs are known do we introduce the probability of winning the litigation.

⁸ We also examined the answer in the Class 8 class slides. Some students may find the schematic approach of the class slides easier to follow than the prose.

1. *Identify WTW's choices on September 9.* WTW can terminate the merger agreement and receive the ARTF immediately, or it can extend the agreement for five months and continue litigating.
2. *Identify the possible outcomes of each choice.* Termination has one certain outcome: WTW receives the \$1 billion ARTF. Extension has two possible outcomes: (a) WTW litigates, loses, and abandons the transaction or (b) WTW litigates, wins, and the transaction closes.
3. *Calculate the incremental payoff from each outcome.* Because the cash consequences occur at different times, put every payoff on the same valuation date by calculating its PDV as of September 9. At this stage, do not assign probabilities. We are asking only what each branch of the decision tree would be worth if it occurred.
4. *Calculate the break-even probability of winning and make the prediction.* Once the payoffs are known, find the probability of winning at which the expected payoff from extending equals the certain payoff from terminating, and then compare that break-even probability with WTW's own subjective probability of winning. If WTW believes its probability of winning is above the break-even probability, it should extend and litigate; if below, it should terminate and take the ARTF.

This sequence separates two different questions that are easy to confuse: What is each possible outcome worth? And how likely is each possible outcome? We answer the valuation question first and the probability question second.

One additional point is important. We do not need to include WTW's entire standalone going-concern equity value in every payoff. That value is the common baseline against which we compare the alternatives. If the deal closes, the deal premium (excluding synergies) measures the incremental value WTW shareholders receive from the exchange ratio above that baseline, and WTW shareholders also receive their 37% share of the merger-created synergies. We can focus on the items that differ among the alternatives: the ARTF, incremental litigation costs, any additional going-concern loss, the deal premium excluding synergies, and WTW's share of the deal synergies.

One warning about method, because it is the easiest way to go wrong on this problem. If the deal closes, WTW shareholders receive a single thing: 37% of the combined company. It is tempting to value that stake by starting from the \$30 billion of Aon shares described in the problem and then adding WTW's share of the synergies on top. That double counts. Any figure representing the market value of a 37% interest in the combined company already capitalizes some or all of the synergies that interest will produce, so adding a separately computed synergy share counts WTW's participation in the synergies twice. How much such a figure capitalizes is itself uncertain, because a trading price reflects what marginal buyers and sellers expect rather than what legacy shareholders as a body expect. The \$30 billion figure carries a further difficulty. It values the Aon shares to be issued at Aon's unaffected March 6, 2020 price, and is therefore 37/63 of Aon's standalone equity value rather than a closing-date valuation of what WTW shareholders will own. Treating it as the value of their 37% interest at closing silently assumes that the combined company will be worth \$81.08 billion ($= \$30 \text{ billion} / 0.37$), and so builds in \$4.18 billion of merger synergies. To keep the two apart, value Aon and WTW at their unaffected standalone going-concern equity values, compute the

premium the exchange ratio delivers before synergies, and value the merger-created synergies as a separate item. That is what the problem's assumptions direct and what we do below.

1. Do not extend the drop-dead date: terminate the agreement

If WTW terminates on September 9, it receives the \$1 billion ARTF on that date. Its payoff, valued as of the drop-dead date, is therefore \$1,000 million.

This payoff is the benchmark against which the litigation option should be measured. No discounting is required because the \$1 billion is received on the valuation date itself. A dollar received on September 9 is already expressed in September 9 dollars.

2. Extend the drop-dead date and litigate

There are two possible outcomes: WTW litigates and loses, or WTW litigates and wins and the transaction closes. Value each outcome as of September 9.

Again, do not ask yet which outcome is more likely. First, value the losing branch and the winning branch separately. After both have been reduced to September 9 PDV, we can ask what probability of winning would make WTW willing to choose litigation.

a. Litigate and lose

The object is to measure the incremental economic consequence of choosing to extend rather than terminate on September 9. Amounts that WTW already incurred before September 9, or values that are the same under both choices, do not affect that decision. WTW's payoff has three components if it litigates and loses.

First, the ARTF is delayed, not eliminated. Under the problem assumptions, WTW receives the \$1 billion fee five months after September 9. We therefore restate that payment in September 9 dollars, discounting at WTW's 5.16% annual WACC, or 0.43% per month.⁹ Why discount the fee? Receiving \$1 billion in February is economically less valuable than receiving \$1 billion on September 9 because money received on September 9 could be invested, used in the business, or used to avoid financing costs during the five-month interval. Present value analysis asks what amount received on September 9 would be economically equivalent to receiving \$1 billion five months later. The formula is $PV = FV / (1 + r)^n$, where FV is the future payment, r is the discount rate for each period, and n is the number of periods. Here, FV is \$1 billion, r is 0.43% per month, and n is five months:

$$PV = \$1,000 \text{ million} / (1 + 0.0043)^5 = \$978.77 \text{ million}$$

Second, WTW incurs \$10 million in additional out-of-pocket litigation expenses beyond the drop-dead date.

⁹ The problem directs us to make five-month timing adjustments at the applicable annual WACC divided by 12, and we follow that convention throughout. The convention is a simplification. A WACC is the discount rate for a company's business risk, while the ARTF is a nearly certain contractual receivable, for which a much lower rate would be appropriate in a real valuation. A lower rate would raise the September 9 value of the delayed fee and therefore shrink the cost of extending and losing, which would strengthen the conclusion we reach below rather than weaken it. Nothing in the analysis turns on the choice.

The word “additional” matters. We are deciding as of September 9. Litigation expenses incurred before that date will be incurred whether WTW terminates or extends, so they do not change the relative payoff between the two September 9 choices. The problem gives us only the \$10 million of expenses that extension itself will cause after the drop-dead date.

Third, for purposes of this exercise, the hypothetical states that we should assume there is no additional diminution in WTW’s going-concern value during the five-month extension. In the absence of other information, this makes sense. By September 9, the deal will already have been pending for 18 months. The relevant comparison is the incremental loss after September 9; any going-concern loss already suffered before that date is common to both options and does not affect the choice between them.

The \$0 is therefore a simplifying assumption about incremental damage during the additional five months, not a claim that the pending transaction caused no damage to WTW. If we believed that keeping the deal pending from September to February would reduce WTW’s standalone value by an additional amount, the PDV of that additional loss would have to be subtracted from the litigate-and-lose payoff.

Accordingly, WTW’s payoff if it litigates and loses is:

$$\$978.77 \text{ million} - \$10 \text{ million} - \$0 = \$968.77 \text{ million}$$

Compared with terminating on September 9 and receiving \$1 billion immediately, extending and losing costs WTW shareholders \$31.23 million in PDV (\$1 billion – 968.77 million).

Be careful about the word “loss.” If WTW litigates and loses, it still receives a positive incremental payoff of \$968.77 million. The \$31.23 million loss is relative to the alternative of taking \$1 billion immediately. Thus, the economic downside of extending and losing is only \$31.23 million. This \$31.23 million is the amount WTW puts at risk by choosing to continue the litigation.

b. Litigate and win

The winning branch is economically different from the losing branch. If WTW wins, the merger closes in February. WTW therefore does not receive the ARTF; that fee is payable only if the deal fails for antitrust reasons. Instead, WTW shareholders receive two incremental benefits from the closing: the deal premium (excluding synergies) and their 37% share of the combined company’s net merger-created synergies. The \$10 million of additional litigation expense is the cost of reaching that result.

This is another place where keeping the common baseline in mind helps. WTW shareholders already own WTW’s standalone value. We do not add that value again when the deal closes. We count only the additional value the merger gives them above the standalone baseline.

WTW’s payoff again has three components.

First, WTW incurs the same \$10 million in additional litigation expenses.

Second, WTW shareholders receive the deal premium (excluding synergies). To avoid double counting some or all of the synergy value, value Aon and WTW at their

unaffected standalone going-concern equity values and value the merger-created synergies separately.

Aon's standalone going-concern equity value is \$51.08 billion, and WTW's is \$25.82 billion, for a combined standalone value of \$76.90 billion before synergies. The exchange ratio gives legacy WTW shareholders 37% of the combined company, or $37\% \times \$76.90 \text{ billion} = \28.453 billion before synergies. Compared with WTW's \$25.82 billion standalone value, the exchange ratio gives legacy WTW shareholders a \$2.633 billion deal premium (excluding synergies) ($= \$28.453 \text{ billion} - \25.82 billion).¹⁰

Because the \$2.633 billion deal premium is not realized until the assumed February 2022 closing, we discount it five months to September 9, 2021, using WTW's 0.43% monthly WACC.

$$\text{PV} = \$2,633 \text{ million} / (1 + 0.0043)^5 = \$2,577.11 \text{ million}$$

The September 9 PDV of the deal premium (excluding synergies) is therefore \$2,577.11 million.

One reconciliation before moving on. The \$2.633 billion premium needs to be reconciled with the announcement data, because at first glance the two look inconsistent. The problem states that the Aon shares to be issued were worth approximately \$30 billion, a 16.2% premium to WTW's unaffected price. Our premium excluding synergies is \$2.633 billion, or 10.2% of WTW's \$25.82 billion standalone value. The two numbers measure different things. The \$30 billion values the Aon shares to be issued at Aon's unaffected March 6, 2020 price, which makes it 37/63 of Aon's standalone equity value rather than a closing-date valuation of what WTW shareholders will own. The \$2.633 billion measures only what the exchange ratio delivers before any synergy value is added.

It helps to work out what treating the \$30 billion as a closing-date value would require. For WTW's 37% stake to be worth \$30 billion at closing, the combined company would have to be worth \$81.08 billion ($= \$30 \text{ billion} / 0.37$), which implies merger synergies of \$4.18 billion ($= \$81.08 \text{ billion} - \76.90 billion). The problem's parameters are internally consistent in that sense: the \$30 billion, the 37% ownership share, and the two standalone equity values all hang together if the merger synergies are worth \$4.18 billion.

But now look at the other side of the transaction. Legacy Aon shareholders would hold 63% of \$81.08 billion, or \$51.08 billion, which is precisely Aon's standalone equity value. Reading the \$30 billion as a closing-date value therefore implies that legacy Aon shareholders capture none of the merger synergies at all. That is not a plausible account of a negotiated transaction, and it is a further reason the problem directs us not to use the figure.

The \$4.18 billion is still useful as a benchmark for our own synergy estimate. The ten-year model developed below values the combined company's after-tax net synergies at \$2.35 billion, only about 56% of it. On our assumptions, WTW's 37% stake is worth about \$29.32 billion at closing ($= 37\% \times (\$76.90 \text{ billion} + \$2.35 \text{ billion})$), roughly

¹⁰ This \$2.633 billion is the deal premium under our valuation assumptions before adding merger-created synergies. It differs from the announced 16.2% premium, which was calculated using Aon's March 6, 2020, unaffected share price to value the Aon shares to be issued to WTW shareholders.

\$680 million less than the \$30 billion figure announced in March 2020. The difference is largely a function of the ten-year horizon the problem specifies; a longer horizon would narrow and eventually close it.

Third, WTW's shareholders receive their share of the merged firm's net synergies. This component requires several steps.

The important first step is to distinguish gross synergies from net synergy cash flow. The announced \$800 million figure is the expected annual run-rate synergy once the integration is substantially complete. It is not the amount of cash the combined company receives from the transaction in the first year. In the early years, the combined company must incur substantial integration, transaction, and retention costs to obtain the synergies.

Using the assumptions in the problem, the first three years of pre-tax net synergy nominal cash flow are:

Year 1: \$267 million – \$700 million – \$200 million – \$133.33 million = –\$766.33 million

Year 2: \$600 million – \$490 million – \$133.33 million = –\$23.33 million

Year 3: \$800 million – \$210 million – \$133.33 million = +\$456.67 million

Beginning in year 4, the assumed pre-tax net synergy cash flow is +\$800 million per year because the one-time integration, transaction, and retention costs have ended. The negative cash flows in years 1 and 2 are not errors: under the assumptions, the transition costs necessary to achieve the synergies exceed the synergies realized in those years.

The problem specifies two valuation assumptions for the synergy stream: a ten-year horizon and an 8% annual discount rate. The ten-year horizon avoids assuming that the \$800 million run-rate synergies will continue unchanged forever, and the 8% rate reflects the greater uncertainty of these long-run projected cash flows compared with a near-certain payment such as the ARTF. With those assumptions, the net present value (NPV) of the first 10 years of the synergies is:

$$NPV = CF_1/(1.08)^1 + CF_2/(1.08)^2 + \dots + CF_{10}/(1.08)^{10} = \$2,939.34 \text{ million}$$

Here, CF_1 through CF_{10} are the combined company's pre-tax net synergy cash flows for years 1 through 10 listed above. Thus, \$2,939.34 million is the pre-tax NPV of the combined company's net synergies as of the February 2022 closing date.

WTW shareholders will own 37% of the combined company, so their share of that closing-date pre-tax NPV is \$1,087.56 million (= 37% x \$2,939.34 million). Discounting that amount back five months at WTW's 0.43% monthly WACC gives a September 9 pre-tax PDV of \$1,064.47 million.

$$PV = \$1,087.56 \text{ million} / (1 + 0.0043)^5 = \$1,064.47 \text{ million}$$

Why take only 37%? The \$2,939.34 million is the NPV of the net synergies for the entire combined company. After closing, legacy WTW shareholders will own 37% of that company and legacy Aon shareholders will own the other 63%. WTW shareholders therefore receive only 37% of the combined company's synergy value, not 100% of it.

Note that there are also two distinct discounting steps, and each serves a different purpose. The 8% discount rate converts the future annual synergy cash flows into a value

as of the February 2022 closing date. We then discount WTW's 37% share of that closing-date value back five months at WTW's monthly WACC because September 9 is the common valuation date for the decision. The first step values a risky multi-year synergy stream; the second adjusts a February value for the five-month timing difference.

Finally, all of the synergy and cost figures above are pre-tax. The hypothetical states that synergy gains are taxed at 20% and that integration, transaction, and retention costs are fully deductible when incurred, at the same rate. Thus, each year's after-tax net synergy cash flow is 80% of its pre-tax amount. That treatment applies to the negative net cash flows in Years 1 and 2 as well, which means we are assuming the combined company has enough other taxable income to use those deductions in the years the costs are incurred. The problem's instruction that the costs are fully deductible when incurred supports that reading, but it is an assumption worth stating. Because multiplication by 80%, discounting, and taking WTW's 37% ownership share are all linear operations, we obtain the same answer by applying the 20% tax adjustment to the final pre-tax PDV rather than tax-effecting each year's cash flow separately.

$$\$1,064.47 \text{ million} \times 0.80 = \$851.58 \text{ million}$$

Thus, \$851.58 million is WTW shareholders' September 9 PDV of their 37% share of the first ten years of after-tax net synergies after accounting for the integration, transaction, and retention costs. It is not simply 37% of the \$800 million annual run-rate synergy.

WTW's total payoff if it litigates and wins is therefore:

$$-\$10 \text{ million} + \$2,577.11 \text{ million} + \$851.58 \text{ million} = \$3,418.69 \text{ million}$$

3. Compare the payoffs

The payoffs, all valued as of the September 9 drop-dead date, are:

Terminate on September 9: +\$1,000.00 million
Extend, litigate, and lose: +\$968.77 million
Extend, litigate, and win: +\$3,418.69 million

Thus, compared with terminating on September 9, WTW risks losing \$31.23 million if it extends and loses, but gains \$2,418.69 million if it extends and wins.

This is the key comparison. Relative to terminating, the downside from extending is small: if WTW loses, it is \$31.23 million worse off. The upside is enormous: if WTW wins, it is \$2,418.69 million better off. In other words, WTW is deciding whether to risk \$31.23 million for a chance to gain almost \$2.42 billion in additional value.

That large asymmetry tells us, even before doing the probability calculation, that WTW does not need to be very confident of winning for extension to have a higher expected payoff. The next step is to determine exactly how small the probability of winning can be before WTW becomes indifferent between extending and terminating.

4. Calculate the break-even probability and make the prediction

If WTW is risk neutral and maximizes expected value, let p be its subjective probability of winning the litigation and closing the deal. The break-even probability p^* equates the expected payoff from extending with the certain \$1 billion payoff from terminating.

Expected value is simply a probability-weighted average of the possible payoffs. If p is WTW's probability of winning, then $1 - p$ is its probability of losing. The expected payoff from extending is therefore p times the \$3,418.69 million winning payoff plus $1 - p$ times the \$968.77 million losing payoff. Terminating, by contrast, produces the \$1 billion payoff with certainty. At the break-even probability, those two expected payoffs are equal:

$$(p^*)(3,418.69) + (1 - p^*)(968.77) = 1,000$$

Solving for p^* :

$$\begin{aligned} p^* &= (1,000 - 968.77) / (3,418.69 - 968.77) \\ &= 31.23 / 2,449.92 \\ &= 0.01275 = 1.27\% \end{aligned}$$

The break-even probability is therefore approximately 1.27%.¹¹ Put differently, WTW needs a probability of winning of only about 1.27%, roughly 13 chances in 1,000, to make extension worthwhile on an expected value basis. For example, if WTW assigns a 2% probability to winning, the expected September 9 payoff from extending is approximately \$1,017.77 million, more than the certain \$1 billion payoff from terminating. This analysis indicates that WTW should terminate and take the \$1 billion ARTF on September 9 only if it believes that its probability of winning the litigation and closing the deal is less than 1.27%. If its subjective probability of success is greater than 1.27%, it should extend the drop-dead date and litigate.

The probability p is subjective. It is not the legal burden of proof or a probability supplied by the court. It is WTW's own business judgment, as of September 9, about the probability that the parties will prevail in the litigation and close the transaction. That judgment would reflect counsel's assessment of the merits, the proposed divestitures, the evidentiary record, the judge, and the other litigation risks.

The 1.27% threshold also assumes that WTW is risk neutral—that is, that it chooses the option with the highest expected monetary payoff. A risk-averse decision-maker might require a somewhat higher probability of success before accepting a gamble. But here the downside is so small relative to the upside that ordinary levels of risk aversion are unlikely to change the basic prediction.

The conclusion is robust even if WTW assigns no value at all to its share of the merger-created synergies. In that case, its winning payoff would still be about \$2,567.11 million (– \$10 million + \$2,577.11 million), and WTW would still be risking only \$31.23 million for the chance to gain about \$1,567.11 million relative to termination. The break-even probability would be only about 1.95%. The recommendation to extend therefore does not depend on placing substantial value on the synergy stream. The deal premium excluding synergies carries the result on its own, and the separately calculated synergy value only strengthens it.

¹¹ The same calculation can be viewed entirely in incremental terms. Relative to terminating, WTW loses \$31.23 million if it extends and loses and gains \$2,418.69 million if it extends and wins. The break-even probability is the probability at which the expected incremental gain from that gamble is zero.

The prediction. The arb asked what we think WTW will do, and the asymmetry answers the question. WTW would have to believe the parties' chance of prevailing is below about 1.3% before taking the fee on September 9 became the better choice. Nothing in the record supports a number that low: the parties have said they intend to litigate the fix, they asked Judge Walton to begin trial on August 23 or as soon after as possible, and they have already obtained conditional clearance from the European Commission. We therefore predict that WTW will not terminate on September 9. It will want to extend the drop-dead date and litigate, and the arb should not expect WTW to walk away from the transaction in exchange for the \$1 billion fee.

Bonus question: Aon's decision

The bonus question asks the same basic decision question from Aon's side of the transaction. As of the September 9, 2021, drop-dead date, Aon can (1) terminate the merger agreement and pay WTW the \$1 billion ARTF immediately or (2) extend the drop-dead date for five months and continue litigating. As before, all payoffs should be expressed in PDV as of September 9 so that amounts paid or received at different times can be compared on the same basis.

There is one sign convention to keep straight. From WTW's perspective, the ARTF and the deal premium (excluding synergies) were benefits and therefore appeared as positive numbers. From Aon's perspective, they are payments or value transfers and therefore appear as negative numbers. A less negative payoff is better for Aon than a more negative payoff.

Strategy.

We can use the same four-step method we used for WTW, but the economics of the branches differ because Aon pays the ARTF and the deal premium (excluding synergies) and will own 63% of the combined company if the transaction closes.

1. *Identify Aon's choices on September 9.* Aon can terminate the merger agreement and pay the \$1 billion ARTF immediately, or it can extend the agreement for five months and continue litigating.
2. *Identify the possible outcomes of each choice.* Termination has one certain outcome: Aon pays the \$1 billion ARTF. Extension has two possible outcomes: Aon litigates, loses, and the transaction terminates, or Aon litigates, wins, and the transaction closes.
3. *Calculate Aon's payoff from each outcome.* Put every payoff on the same September 9 valuation date. Do not assign probabilities yet. First determine what each branch of the decision tree would cost or yield Aon if it occurred.
4. *Calculate the break-even probability of winning and make the prediction.* Once the payoffs are known, find the probability of winning at which Aon is indifferent between extending and terminating, and then compare that break-even probability with Aon's own subjective probability of winning. That comparison will tell us whether Aon should extend and litigate or terminate and pay the ARTF.

As with WTW, we do not need to include Aon's entire standalone going-concern equity value in every branch. That value is common to Aon's alternatives. We focus on the incremental amounts that change depending on Aon's September 9 choice: the ARTF, the additional litigation costs, the deal premium (excluding synergies) if the transaction closes, and Aon's share of the combined company's synergies.

1. Do not extend the drop-dead date: terminate the agreement and pay the ARTF

If Aon terminates on September 9, it must pay WTW the \$1 billion ARTF on that date. Because the payment occurs on the valuation date, no discounting is required. Aon's payoff is therefore:

–\$1,000 million

The negative sign reflects that the ARTF is a cash outflow from Aon. The \$1,000 million outflow is the benchmark against which the two litigation outcomes should be compared.

2. Extend the drop-dead date and litigate

If Aon extends, two outcomes are possible: it litigates, loses, and the transaction terminates; or it litigates, wins, and the transaction closes. Again, we value the two outcomes separately and introduce the probability of winning only after we know those values.

a. Litigate and lose

If Aon litigates and loses, the transaction does not close. Aon therefore does not bear the cost of the deal premium (excluding synergies) and receives no synergy benefits. After September 9, there are only two incremental cash consequences: the additional litigation expense and the delayed payment of the ARTF.

First, the additional litigation expense. Aon incurs \$15 million in out-of-pocket litigation expenses beyond the drop-dead date. As in the WTW analysis, expenses incurred before September 9 are common to both choices and do not affect the September 9 decision.

Second, the delayed payment of the ARTF. If Aon loses, it still must pay the \$1 billion ARTF, but would not pay the fee until the court's decision five months after September 9. From Aon's perspective, delay is beneficial: a \$1 billion payment in February has a smaller September 9 present cost than a \$1 billion payment made immediately.

Using Aon's 5.8% annual WACC, or approximately 0.4833% per month,¹² the September 9 PDV of the \$1 billion payment due five months later is:

$$PV = \$1,000 \text{ million} / (1 + 0.058/12)^5 = \$976.18 \text{ million}$$

¹² The discount-rate convention matters more here than it did for WTW. Aon's advantage from extending and losing exists only because the \$23.82 million of delay benefit exceeds the \$15 million of litigation cost, and the delay benefit exceeds \$15 million only at annual rates above roughly 3.7%. The ARTF is a nearly certain contractual payable, and at a rate appropriate to such an obligation the delay benefit would be a few million dollars at most. Extending and losing would then be worse than terminating, both branches of extension would be worse than terminating, and extension would be dominated outright: Aon should terminate whatever probability of success it assigns. The problem's convention thus understates the case for termination rather than overstating it.

Why is this a benefit to Aon? If Aon paid the ARTF on September 9, it would give up \$1 billion immediately. By delaying the payment for five months, Aon retains the use of that money during the interval: it can invest the cash, use it in the business, or avoid financing costs. The value of that five-month delay, measured as of September 9, is:

$$\text{\$1,000 million} - \text{\$976.18 million} = \text{\$23.82 million}$$

This \$23.82 million is not an additional payment to Aon. It is the time-value benefit of postponing a \$1 billion cash outflow. The benefit matters because it can offset some or all of the incremental cost of continuing the litigation.

Aon's total payoff if it extends and loses is therefore:

$$-\text{\$15 million} - \text{\$976.18 million} = -\text{\$991.18 million}$$

Compare this with the $-\text{\$1,000 million}$ payoff from terminating on September 9. Extending and losing is actually \$8.82 million better for Aon in September 9 PDV terms:

$$-\text{\$991.18 million} - (-\text{\$1,000 million}) = +\text{\$8.82 million}$$

The result is initially counterintuitive. Losing the litigation does not make Aon better off in any absolute sense; Aon still pays almost \$1 billion in PDV. But relative to terminating immediately, the \$23.82 million benefit from delaying the ARTF is larger than the \$15 million additional litigation cost. Thus, Aon can extend, litigate, lose, and still be \$8.82 million better off than if it had terminated on September 9.

b. Litigate and win

If Aon litigates and wins, the transaction closes in February 2022, and Aon does not pay the ARTF. Instead, the winning branch has three incremental components: (1) the additional litigation expense, (2) the value transferred to WTW shareholders through the deal premium (excluding synergies), and (3) Aon's 63% share of the combined company's net synergies. As in every other branch, we value each component as of September 9.

First, the additional litigation expense. Aon incurs the same \$15 million in out-of-pocket litigation expenses beyond the drop-dead date.

Second, the deal premium excluding synergies. In the WTW analysis, the deal premium attributable to the exchange ratio before adding merger-created synergies is \$2.633 billion. From Aon's perspective, this amount is a cost: it is the value legacy Aon shareholders transfer to WTW shareholders above WTW's standalone going-concern equity value to complete the acquisition.

Because this is an all-stock transaction, Aon is not literally writing WTW shareholders a separate \$2.633 billion check for the premium. The economic cost arises because the exchange ratio gives legacy WTW shareholders 37% of the combined company's standalone going-concern equity value before synergies. As shown in the WTW analysis, that 37% interest is worth \$28.453 billion before synergies, or \$2.633 billion more than WTW's \$25.82 billion standalone going-concern equity value. For purposes of comparing Aon's alternatives, that value transfer is the relevant deal premium (excluding synergies).

The \$2.633 billion premium is measured at the assumed February closing date. Because our common valuation date is September 9, discount it back five months using Aon's 5.8% annual WACC, or approximately 0.4833% per month:

$$PV = \$2,633 \text{ million} / (1 + 0.058/12)^5 = \$2,570.28 \text{ million}$$

Thus, the September 9 PDV of the deal premium excluding synergies is $-\$2,570.28$ million to Aon. The negative sign reflects the premium value legacy Aon shareholders give up if the transaction closes.

Third, Aon's share of the net synergies. The underlying combined-company synergy calculation is the same one used in the WTW analysis. Using a ten-year horizon and an 8% discount rate, the combined company's pre-tax NPV of net synergies at the February closing date is \$2,939.34 million.

The only ownership difference is that legacy Aon shareholders will own 63% of the combined company, while legacy WTW shareholders will own 37%. Aon's closing-date share of the combined company's pre-tax net synergy NPV is therefore:

$$\$2,939.34 \text{ million} \times 0.63 = \$1,851.78 \text{ million}$$

That \$1,851.78 million is a February 2022 value. To compare it with Aon's September 9 termination option, discount it back five months at Aon's 0.4833% monthly WACC (the result remains a pre-tax figure):

$$PV = \$1,851.78 \text{ million} / (1 + 0.058/12)^5 = \$1,807.67 \text{ million}$$

Finally, apply the problem's 20% tax assumption. As explained in the WTW analysis, because the synergy gains are taxable and the integration, transaction, and retention costs are fully deductible at the same tax rate, we can apply the 20% tax adjustment to the net PDV as a whole:

$$\$1,807.67 \text{ million} \times 0.80 = \$1,446.14 \text{ million}$$

Thus, \$1,446.14 million is the September 9 PDV of legacy Aon shareholders' 63% share of the first ten years of after-tax net synergies. It already reflects the synergy ramp-up, the integration, transaction, and retention costs, the 8% discount rate applied to the multi-year synergy stream, the 63% ownership share, the five-month timing adjustment, and the 20% tax rate.

Aon's total payoff if it extends, litigates, and wins is therefore:

$$-\$15 \text{ million} - \$2,570.28 \text{ million} + \$1,446.14 \text{ million} = -\$1,139.14 \text{ million}$$

The result is important. Winning the antitrust litigation is a legal success, but under our ten-year financial assumptions, it is an economic loss for Aon relative to terminating on September 9. If Aon extends, litigates, and wins, it avoids the \$1 billion ARTF, but it must complete the acquisition, bear the \$2.570 billion September 9 PDV of the deal premium (excluding synergies), while legacy Aon shareholders receive a \$1.446 billion September 9 PDV of their share of after-tax net synergies. *On these assumptions, the synergy value is not large enough to offset the premium.*

3. Compare the payoffs

Aon's payoffs, all valued as of September 9, are:

Terminate on September 9: –\$1,000.00 million

Extend, litigate, and lose: –\$991.18 million

Extend, litigate, and win: –\$1,139.14 million

Compared with terminating on September 9, Aon is \$8.82 million better off if it extends and loses, but \$139.14 million worse off if it extends and wins. The incremental comparison is therefore:

Extend and lose: +\$8.82 million relative to termination

Extend and win: –\$139.14 million relative to termination

This is the key and counterintuitive feature of Aon's decision. Under our ten-year valuation assumptions, Aon benefits slightly from extending if it ultimately loses because the time-value benefit from delaying the ARTF exceeds the additional litigation expense. But if Aon wins, it must complete a transaction in which the ten-year PDV of its share of the synergies is not large enough to offset the deal premium excluding synergies. Thus, a higher probability of winning makes extension less attractive to Aon, not more attractive. That reversal also means Aon's break-even probability operates in the opposite direction from WTW's, as the next section shows.

4. Calculate the break-even probability and make the prediction

Assume Aon is risk neutral and maximizes expected monetary value. Let p be Aon's subjective probability of winning the litigation and closing the deal. If Aon extends, the probability of winning is p and the probability of losing is $1 - p$. The break-even probability p^* is the probability at which the expected payoff from extending equals the certain –\$1 billion payoff from terminating:

$$(p^*)(-1,139.14) + (1 - p^*)(-991.18) = -1,000$$

Solving for p^* :

$$\begin{aligned} p^* &= [-1,000 - (-991.18)] / [-1,139.14 - (-991.18)] \\ &= -8.82 / -147.96 \\ &= 0.05961 = 5.96\% \end{aligned}$$

Using the incremental payoffs from the preceding section, the same condition can be written as the probability of winning at which the expected incremental value of the two outcomes is zero:

$$(p^*)(-\$139.14) + (1 - p^*)(+\$8.82) = \$0$$

The break-even probability is therefore approximately 5.96%. This means that if Aon believes its probability of winning exceeds 5.96%, the expected payoff from extending is worse than the certain –\$1 billion payoff from terminating. For example, at a 10% probability of winning, the expected September 9 payoff from extending is approximately –\$1,005.98 million, about \$5.98 million worse than terminating immediately.

The decision rule runs opposite to WTW's. WTW should extend when its probability of winning is above its break-even probability because winning produces the large upside. Aon, under the ten-year assumptions used here, should terminate when its probability of

winning is above its break-even probability because winning produces a downside. Aon should extend only if it believes its probability of winning is less than approximately 5.96%.

As before, p is a subjective business judgment rather than a legal burden of proof. Aon's assessment would reflect counsel's view of the merits, the proposed divestitures, the evidentiary record, the judge, and other litigation risks. It would be difficult to imagine Aon assigning a probability of success below 5.96% if it genuinely intended to litigate the fix.

The calculation also assumes risk neutrality. Risk aversion would strengthen, rather than weaken, the conclusion in favor of termination: extending offers Aon only an \$8.82 million improvement if it loses but exposes it to a \$139.14 million deterioration if it wins. A risk-averse decisionmaker would generally require an even smaller probability of the adverse financial branch before preferring that gamble to the certain -\$1 billion termination payoff.

Accordingly, under the ten-year financial assumptions used in this exercise, Aon should terminate the merger agreement on September 9 and pay WTW the \$1 billion ARTF unless Aon believes that its probability of winning the litigation and closing the deal is less than approximately 5.96%.

The prediction. Aon should terminate, and it did. The reason is not the 5.96% threshold but what stands behind it. Legacy Aon shareholders own 63% of the synergies, and over the problem's ten-year horizon their share is worth \$1,481.43 million at closing against a \$2,633 million premium, a shortfall of \$1,151.57 million. Winning the litigation therefore means completing a transaction that, on these assumptions, leaves legacy Aon shareholders worse off than if the deal had never been signed. That is why winning is worse for Aon than paying \$1 billion to walk away. The margin is not large: extend the synergy horizon from ten years to roughly ten years and ten months and the winning branch would tie termination. In any event, on July 26, 2021, six weeks before the drop-dead date, Aon and WTW mutually terminated the agreement and Aon paid the fee; Aon's shares rose 8.2% that day and WTW's fell 9.0%. The class slides take up what happened and how the market reacted.

Notes

The following notes explore some implications and sensitivities of the financial analysis above; they are not necessary to the basic solution of the assignment. Note 1 tests the ten-year horizon, Note 2 examines Aon's own published valuation, and Notes 3 through 5 ask from three directions whether the deal premium was a sound investment for legacy Aon shareholders.

1. *The ten-year horizon and the durability of the synergies.* The 5.96% break-even result above is based on the problem's ten-year horizon for the merger-created synergy stream. The ten-year cutoff is a modeling assumption, not a prediction that the synergies disappear after Year 10. If steady-state synergies persist for many years, much of the value lies outside the ten-year window.

At steady state, the combined company is assumed to realize \$800 million of annual pre-tax synergies. Legacy Aon shareholders own 63% of the combined company and, under the problem's 20% tax assumption, receive \$403.2 million per year in steady-state after-tax cash

flows. Our ten-year calculation gives legacy Aon shareholders a closing-date PDV of \$1,481.43 million for Years 1 through 10 of after-tax net synergies. That is the same stream the analysis above valued at \$1,446.14 million; the two figures differ only because the notes measure at the February closing while the analysis measured at September 9. If the \$403.2 million steady-state after-tax synergy share continues indefinitely after Year 10, the closing-date PDV of Years 11 and thereafter is:

$$\text{PDV of Years 11+} = (\$403.2 \text{ million} / 0.08) / (1.08)^{10} = \$2,334.50 \text{ million}^{13}$$

Adding the PDV of the synergies in Years 1 through 10 and the PDV of the synergies in Year 11 forward gives a total perpetual PDV at closing of approximately \$3,815.93 million (= \$1,481.43 million + \$2,334.50 million), so about 61.2% of the perpetual after-tax synergy value lies beyond the ten-year horizon.

The consequence is stark. Under the ten-year horizon, Aon's \$1,481.43 million synergy PDV is \$1,151.57 million below the \$2.633 billion deal premium (excluding synergies). Under a perpetual horizon, the \$3,815.93 million synergy PDV exceeds that premium by \$1,182.93 million. The same transaction is a \$1.15 billion loss or a \$1.18 billion gain depending on nothing but the horizon. Whether the deal creates value for legacy Aon shareholders therefore depends critically on how long the synergies persist and the time horizon Aon uses to evaluate them.

2. *Aon's public valuation of the merger synergies.* In its investor presentation, Aon stated that the combination would create "over \$10 billion of expected shareholder value" from the capitalized value of expected pre-tax synergies, net of expected one-time transaction, retention, and integration costs. The public statement does not disclose Aon's valuation model, but the figure can be bracketed using assumptions the problem itself supplies.

Ignoring one-time costs, a flat \$800 million annual run-rate synergy capitalized as a perpetuity at 8% has a PDV of \$10 billion: \$800 million / 0.08 = \$10 billion. The match to Aon's headline figure is a coincidence rather than a reconstruction, because Aon's \$10 billion is net of one-time costs and this calculation ignores them.

Because Aon said "over \$10 billion" net of one-time costs, its actual valuation necessarily used assumptions producing materially more than \$10 billion before those costs—for example, a lower discount rate, growth in the synergy stream, or some combination of assumptions. Aon's own reported WACC supplies a candidate. Capitalizing the \$800 million run rate at 5.8% gives \$13.79 billion, and netting the \$2.0 billion of one-time costs the problem specifies—\$1.4 billion of integration costs, \$200 million of transaction costs, and \$400 million of retention costs—leaves \$11.79 billion, which is "over \$10 billion" using nothing but figures already in the problem.

One caution in using Aon's figure alongside our own. Aon's \$10 billion is the capitalized value of pre-tax synergies. If the combined company's net merger-created value were \$10 billion, legacy Aon shareholders' 63% share would be \$6.3 billion, and subtracting the \$2.633 billion deal premium (excluding synergies) would leave a \$3.667 billion gain. But that comparison nets a pre-tax synergy figure against a real cost. On the after-tax convention used

¹³ Be sure you understand this calculation. The term \$403.2 million / 0.08 gives the value of a perpetual annual net cash flow of \$403.2 million, discounted at 8% per year: \$5.040 billion. But the \$403.2 million annual cash flows covered by this calculation do not begin until Year 11. The \$5.040 billion is therefore the value, at the end of Year 10, of the perpetual stream beginning in Year 11. To determine what that \$5.040 billion is worth at the closing date, we discount it back ten years. Dividing \$5.040 billion by $(1.08)^{10}$ gives the closing-date present value of the synergy cash flows in Years 11 and thereafter.

throughout this answer, the 63% share is \$5.04 billion (= 63% x \$10 billion x 0.80) and the gain to legacy Aon shareholders is \$2.407 billion.

3. *Return on Aon's investment in the deal premium.* Legacy Aon shareholders' steady-state after-tax share of the \$800 million run-rate synergies is \$403.2 million per year. Treating the \$2.633 billion deal premium (excluding synergies) as the incremental investment needed to obtain that stream gives a simplified steady-state return of:

$$\$403.2 \text{ million} / \$2,633 \text{ million} = 15.31\%$$

That 15.31% steady-state return is 684 basis points above Aon's reported 8.47% ROIC. But it does not measure the return on the entire investment because Aon does not receive \$403.2 million beginning in Year 1. The synergies ramp up over three years, and the combined company incurs substantial integration, transaction, and retention costs before reaching steady state.

Legacy Aon shareholders' after-tax share of the net synergy cash flows is approximately – \$386.23 million in Year 1, – \$11.76 million in Year 2, +\$230.16 million in Year 3, and +\$403.2 million per year thereafter. If we treat the \$2.633 billion premium as the initial investment and assume the \$403.2 million annual after-tax synergy stream continues indefinitely after Year 3, the internal rate of return (IRR) on this incremental investment is approximately 10.57%. That IRR is below the 15.31% steady-state return, but remains above both the 8% discount rate used in our synergy valuation and Aon's reported 8.47% ROIC. Aon's reported ROIC is not necessarily the correct hurdle rate for a new acquisition, but it is a useful benchmark. Aon's 5.8% WACC would be the more conventional hurdle for a new investment, and the IRR clears that as well. Note, though, that this calculation assumes the \$403.2 million stream continues indefinitely after Year 3. It therefore belongs to the perpetual world of Note 1 rather than the ten-year world of the analysis above, which is why it points the other way: on a ten-year horizon the same investment falls \$1,151.57 million short of the premium.

4. *Discounted payback period.* Another way to view the transaction is to ask how long it takes the PDV of legacy Aon shareholders' synergy stream to equal the \$2.633 billion deal premium (excluding synergies). Ignoring the synergy ramp-up and one-time costs, legacy Aon shareholders' steady-state share of the \$800 million annual run-rate synergies is \$504 million per year pre-tax and \$403.2 million per year after tax.

At an 8% discount rate, the PDV of a \$504 million annual annuity equals \$2.633 billion after about 7.0 years; the PDV of a \$403.2 million annual annuity equals \$2.633 billion after about 9.6 years. Both figures ignore the ramp-up and the one-time costs by construction. On the actual modeled cash flows, which begin with two years of net outflows, legacy Aon shareholders' discounted payback on the premium is roughly 18.8 years. That is the distance between the 9.6-year annuity figure and the finding in Note 1 that the ten-year stream falls \$1,151.57 million short of the premium.

A long discounted payback period is not necessarily evidence of a bad deal. The next note takes up why a buyer might rationally accept one.

5. *Why Aon might accept a long discounted payback period.* Several features of the Aon/WTW transaction could support management's willingness to accept a long discounted payback period. Aon's public valuation implies that it expected the synergies to be very long-lived. Aon may also have regarded much of the projected \$800 million run-rate synergy as relatively durable and achievable because much of it consisted of cost reductions rather than more speculative revenue synergies. Finally, Aon also claimed substantial strategic benefits beyond the quantified \$800 million.

If synergies are long-lived enough, the expected return could exceed Aon's required return. The all-stock structure also avoided acquisition-financing pressure, and Aon's operating history may have given management confidence in its ability to execute the integration and realize the projected savings.

These considerations do not establish that Aon's management was correct to agree to the transaction on the negotiated terms. It is worth remembering that the market took the other side of the question: Aon's shares rose 8.2% on the day the transaction was abandoned.