



TIAA Brokerage Customer Account Agreement (TIAA IRA)

Brokerage accounts are provided by TIAA-CREF Individual & Institutional Services, LLC, Member FINRA and SIPC, and are carried by Pershing LLC ("Pershing"), Member FINRA, NYSE, SIPC, a subsidiary of The Bank of New York Mellon Corporation.

I. General terms and conditions

By signing the TIAA IRA Account Application ("Account Application"), I agree to be bound by the following terms and conditions as well as the terms and conditions set forth in Sections II and III of this agreement (collectively, with the Account Application, this "Agreement"):

1. "I," "me," and "my" refers to the individual signing the Account Application. "TIAA" refers to Teachers Insurance and Annuity Association of America. "TC Services" refers to TIAA-CREF Individual & Institutional Services, LLC, a wholly owned subsidiary of TIAA. "Pershing" refers to Pershing LLC, the entity TC Services has designated as its clearing firm.
2. This Agreement governs investments and activities undertaken in conjunction with the optional self-directed brokerage feature of the TIAA IRA offered by TC Services. I hereby acknowledge having elected to open a self-directed brokerage account ("Account") as part of my TIAA IRA. I understand that the terms, conditions, rights and responsibilities contained in this Agreement apply only to my Account, and that the other investments in my TIAA IRA, such as TIAA proprietary mutual funds and annuities, and cash deposits products are governed by other agreements and documents, including the TIAA IRA Disclosure Statement, the TIAA IRA Directed Trustee Agreement and the TIAA IRA Adoption Agreement, copies of which I hereby acknowledge having received and reviewed (the "Governing Agreements"). I understand that unless specifically provided otherwise in this Agreement, the terms, conditions, rights and responsibilities contained in the Governing Agreements shall apply. Capitalized terms not defined in this Agreement shall have the same meaning as in the Governing Agreements unless specifically provided otherwise herein. If a provision of this Agreement is inconsistent with the Governing Agreements, the terms of this Agreement shall take precedence.
3. I understand that TIAA, FSB is the named directed trustee for the TIAA IRA. Pershing, pursuant to a Clearing Agreement with TC Services, will carry the Account and hold the Account's brokerage funds and securities in its role as clearing broker.

I acknowledge that when I transfer mutual funds from my TIAA IRA into my Account that TC Services will direct such securities to Pershing, which shall safekeep my Account and any such securities and related cash balances as service agent for the Directed Trustee. The Directed Trustee will be responsible for the safekeeping and custody of all other security and cash deposit products held in your TIAA IRA not held in the account.

4. I represent that I am of the age of majority, of legal capacity, and the information I have provided on my Account Application is accurate. I will notify TC Services of any change to the information provided on my Account Application within 30 days of such change. I will promptly notify TC Services within 10 days if I become a director, 10% beneficial shareholder or an affiliate of a publicly traded company, or if I become an employee of any securities exchange, self-regulatory organization, or a corporation of which an exchange owns a majority of the capital stock.

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5. By opening an Account, I understand that I am establishing a brokerage account with TC Services through the TIAA IRA. The Account will be established with TC Services in the name of the Directed Trustee for my benefit, and I shall direct all investments in my Account. I shall be fully responsible for all investment decisions relating to my Account. I understand and accept the risks of investing through an individual brokerage account and accept responsibility for any losses I may incur as a result of such investments. I understand that it is my responsibility to follow all requirements and limitations for trading with TC Services and that if I refuse to comply, TC Services may, in its sole discretion, refuse to execute any and all transactions for my Account, restrict my Account or terminate my Account, all without prior notice to me. I understand that before placing any order, I am responsible for ensuring that the transaction will be in compliance with all TC Services' policies, procedures, restrictions and requirements of the TIAA IRA, and any statutory or regulatory requirements. TC Services has no obligation to ensure compliance prior to accepting an order. I acknowledge that as a self-directed investor, I am solely responsible for deciding whether my brokerage transactions are suitable investments in light of my stated objectives and financial situation, and that none of TC Services, the Directed Trustee and Pershing is responsible for providing investment advice of any kind, including determining whether my transactions are permissible or suitable for my IRA. I acknowledge and agree that I may not use this Account to invest in municipal securities, commodity futures contracts, purchase securities on margin, and/or to engage in any investment in which the risk of loss may exceed the value of my Account. TC Services may provide me with market data or research relating to securities and securities markets, but does not guarantee the accuracy, completeness, or timeliness of such information. Such market data or research is not personalized or in any way tailored to my personal financial circumstances or investment objectives, unless TC Services has otherwise specifically agreed in writing in connection with an advisory program. Other than in limited circumstances, TC Services limits the research available regarding mutual funds to certain mutual funds and shares classes of mutual funds that provide TC Services with a minimum level of compensation. I may be able to obtain research on such other mutual funds through other providers.
6. I acknowledge that TC Services, the Directed Trustee and/or Pershing, in their sole discretion, may disallow or restrict my ability to purchase particular securities or other property due to volatility or other factors. I agree that TIAA, Pershing and or Custodian may place trading, disbursement or other full or partial restrictions on my account as deemed necessary, including but not limited to, the following circumstances: pursuant to a court order, tax levy, or garnishment; at the request of a government agency or law enforcement authority; in the event that my account is restricted (including, but not limited to, trading or trade-related violations, or termination of custodianship at the age of termination); in the event that a deposit has not yet settled; or in the event of a dispute between joint tenants. I agree to abide by any such restriction and not to initiate trades or transactions which would violate the restriction. I agree to allow TC Services, the Directed Trustee and/or Pershing to liquidate securities in my account to satisfy any court order, garnishment, tax levy, or other legal obligation imposed by a court or government agency. I agree not to hold TC Services, the Directed Trustee and/or Pershing liable for any trading losses, lost profits, tax obligation, or other damages resulting from liquidations or trading or disbursement restrictions imposed on my account in connection with a court order, tax levy, garnishment or other legal proceeding. Furthermore, I acknowledge that the Directed Trustee, TC Services and Pershing have no fiduciary role or obligation with respect to my Account and are not responsible for losses or damages resulting from any investment transaction, including investment losses. I acknowledge that TC Services, the Directed Trustee and Pershing do not provide legal, accounting or tax advice and are not responsible for determining whether a particular investment might generate taxable income to an otherwise tax-exempt trust or for determining whether a particular transaction would constitute a "prohibited transaction" as that term is defined in the Internal Revenue Code of 1986 and Employee Retirement Income Security Act of 1974 ("ERISA") and their implementing regulations. I understand that TC Services, the Directed Trustee and Pershing are not authorized to give any

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investment, legal, tax or accounting advice and I will not solicit or rely upon any such advice from TC Services, the Directed Trustee, or Pershing or any of their employees, whether in connection with transactions in or for any of my Account or otherwise.

7. I acknowledge that I will be charged a commission on applicable transactions and other account-related fees in accordance with the TC Services Commission and Fee Schedule at the end of this agreement, as may be amended from time to time. TC Services receives remuneration in connection with the mutual funds that I invest in, including but not limited to money market funds and exchange traded funds, including 12b-1 fees and other compensation from Pershing, or a mutual fund's distributor, transfer agent or investment adviser for marketing, shareholder servicing fees and/or distribution services. Additionally, Teachers Advisors, Inc., the investment adviser to the TIAA-CREF Funds, and the advisory entities of TIAA's wholly owned subsidiary, Nuveen Fund Advisors, LLC, the investment advisers to the Nuveen Funds, receive fees from the mutual funds for investment advisory and/or fund administration services. See the respective mutual funds' prospectus or statement of additional information for mutual fund payment information. With certain exceptions, TC Services limits the mutual funds available for purchase through my brokerage account to mutual funds, or share classes of a mutual fund, that include a minimum level of compensation to TC Services. In some cases, TC Services makes available for purchase multiple share classes of mutual funds, including multiple share classes of the Nuveen Funds and TIAA-CREF Funds. However, not all share classes of all mutual funds may be available for purchase, including in some cases, the lowest cost share classes of mutual funds. Mutual fund purchases are subject to the initial and subsequent minimum investment amounts as set forth in the mutual funds' prospectuses. I may also be able to purchase other share classes of the mutual funds from the mutual funds directly or through other providers. The funds available through a TC Services brokerage account, including available share classes of particular mutual funds, may change over time at TC Services' discretion. The fees charged with respect to any mutual fund classes that are now or in the future made available through a TC Services brokerage account may also change over time at TC Services' discretion or by the mutual fund itself. For more information on how TC Services gets paid for its products and services, please refer to our "Regulation Best Interest-Form CRS" located at the bottom of the home page of our website at https://www.tiaa.org/public/pdf/support/regbi/TIAA_FormCRS.pdf.
8. I acknowledge that this Agreement cannot be modified by conduct and/or the failure of TC Services, the Directed Trustee and Pershing at any time to enforce its rights hereunder to the greatest extent permitted by law, and shall not be deemed to waive, modify or relax any of the rights granted to TC Services, the Directed Trustee and Pershing and/or Custodian herein.
9. I acknowledge that I must instruct TC Services by phone, online or other TC Services designated channels, to liquidate investments in my TIAA IRA account and transfer the resulting funds to my Account. I acknowledge that any such liquidation and transfer may take several days to complete.
10. I acknowledge that, at the time I place a trade, I am solely responsible for ensuring that I have sufficient funds in my Account to cover my purchase. I also acknowledge that TC Services may review, reject, cancel or modify any securities transactions that I have entered at any time, for any reason and without prior notice to me. I authorize TC Services to accept my oral or electronic instructions for the purchase and sale of securities. I acknowledge that such instructions must be placed through a designated TC Services channel. TC Services will not accept orders or instructions sent via postal mail (including but not limited to U.S. mail or overnight delivery).
11. I acknowledge that TC Services may suspend or terminate my Account at any time, for any reason and without prior notice to me. If I do not fund my account within 30 days of account opening or my account remains unfunded and inactive (no statement is generated) during any three-month consecutive period, TIAA reserves the right to close my account without prior notice to me. Once my account is closed, for any reason, TIAA Brokerage reserves the right to reject any new account application submitted by me or on my behalf. In addition, if I maintain a small

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balance in my account (for example, \$100 or less), during any three month consecutive period, TIAA reserves the right to close my account without prior notice to me. I shall have 30 days from receiving notice of termination of my Account to transfer all holdings from within my Account to my TIAA IRA account. Should I fail to complete this transfer within 30 days, I direct TC Services to liquidate the Account holdings and to make the transfer on my behalf. In the event my Account is liquidated, I agree to be liable for any resulting losses and costs incurred by TC Services and any account fees associated with the liquidation: acknowledge that any such amounts will be deducted from the liquidation amount before being transferred to the TIAA IRA. I may close the Account at any time by giving TC Services notice. I acknowledge that my TIAA IRA Account may require that any amount transferred from my Account to the other investment options under the TIAA IRA Account first be transferred into the Trust FSB Bank Deposit Product, and that I am free thereafter to reallocate this amount within my TIAA IRA Account as I choose and as allowed by the Governing Agreements.

12. I acknowledge that I will pay in full for securities I purchase by the settlement date. For transactions not settled by settlement date, TC Services shall have the right, without notice to me, to sell any securities purchased.
13. TC Services will have a lien against my Account assets for any outstanding balance owed by my Account or by me with respect to my Account, except where prohibited by law. In enforcing its lien, TC Services shall have the discretion to determine which assets are to be sold, except where prohibited by law. TC Services may transfer securities or other property from my TIAA IRA Account, without notice, to my Account in order to satisfy deficiencies in my Account, except where prohibited by law. I grant TC Services the right of setoff against any other assets I hold at TIAA through my TIAA IRA. I acknowledge and agree that (i) any such lien and right of setoff are for the purpose of satisfaction of outstanding fees and expenses due with respect to my TIAA IRA, (ii) should any setoff occur in accordance with this paragraph, I shall be considered to have directed payment of the applicable amount from my TIAA IRA and (iii) I am solely responsible for the effects on my TIAA IRA of the payment of any fee or expense from assets of my TIAA IRA (including any such payment by reason of my deemed direction), whether or not from the Account. I acknowledge and agree that none of TC Services, the Directed Trustee, nor Pershing shall have any liability whatsoever with respect to the establishment of a lien or the execution of any setoff pursuant to this paragraph. I agree to pay any costs or expenses incurred by TC Services, including reasonable attorneys' fees that result from my failure to properly settle any securities transactions, pay any debt or otherwise satisfy my obligations under this Agreement.
14. I acknowledge that various federal and state laws or regulations may be applicable to transactions in my Account regarding restricted securities, as defined by applicable securities laws and regulations. It is my responsibility to notify TC Services if my Account contains restricted securities and to ensure that any transaction I effect will conform to all applicable laws and regulations. I understand that transactions in restricted securities may take longer to process than transactions involving unrestricted securities. Additionally, I acknowledge that TC Services is obligated by federal securities laws to provide my name, address and holdings information to issuers of those securities upon request, unless I instruct TC Services in writing not to do so. Notwithstanding the foregoing, TC Services may, at its discretion, refuse to permit restricted securities within my Account.
15. **I acknowledge this Agreement contains a pre-dispute arbitration clause. By signing an arbitration agreement, the parties agree as follows:**
 - a. All parties to this Agreement are giving up the right to sue each other in court, including the right to a trial by jury, except as provided by the rules of the arbitration forum in which a claim is filed.
 - b. Arbitration awards are generally final and binding; a party's ability to have a court reverse or modify an arbitration award is very limited.
 - c. The ability of the parties to obtain documents, witness statements and other discovery is generally more limited in arbitration than in court proceedings.

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- d. The arbitrators do not have to explain the reason(s) for their award unless in an eligible case, a joint request for an explained decision has been submitted by all parties to the panel at least 20 days prior to the first scheduled hearing date.
- e. The panel of arbitrators will typically include a minority of arbitrators who were or are affiliated with the securities industry.
- f. The rules of some arbitration forums may impose time limits for bringing a claim in arbitration. In some cases, a claim that is ineligible for arbitration may be brought in court.
- g. The rules of the arbitration forum in which the claim is filed, and any amendments thereto, shall be incorporated into this Agreement.

ANY CONTROVERSY THAT SHALL ARISE BETWEEN THE ACCOUNT HOLDER AND TC SERVICES, ITS AFFILIATES OR PERSHING (INCLUDING BUT NOT LIMITED TO CONTROVERSIES CONCERNING ANY ACCOUNT, ORDER OR TRANSACTION, OR THE CONTINUATION, PERFORMANCE, OR BREACH OF THIS OR ANY OTHER AGREEMENT BETWEEN THE ACCOUNT HOLDER AND TC SERVICES, ITS AFFILIATES OR PERSHING, WHETHER ENTERED INTO OR ARISING BEFORE, ON OR AFTER THIS ACCOUNT IS OPENED) SHALL BE SUBMITTED TO ARBITRATION BEFORE AND ONLY BEFORE THE FINANCIAL INDUSTRY REGULATORY AUTHORITY. ARBITRATION MUST BE COMMENCED BY SERVICE UPON THE OTHER PARTY OF A WRITTEN DEMAND FOR ARBITRATION OR A WRITTEN NOTICE OF INTENTION TO ARBITRATE, THEREIN INDICATING THE ARBITRATION TRIBUNAL. NO PERSON SHALL BRING PUTATIVE OR CERTIFIED CLASS ACTION TO ARBITRATION, NOR SEEK TO ENFORCE ANY PREDISPUTE ARBITRATION AGREEMENT AGAINST ANY PERSON WHO HAS INITIATED IN COURT A PUTATIVE CLASS ACTION; OR WHO IS A MEMBER OF A PUTATIVE CLASS WHO HAS NOT OPTED OUT OF THE CLASS WITH RESPECT TO ANY CLAIMS ENCOMPASSED BY THE PUTATIVE CLASS ACTION UNTIL: (I) THE CLASS CERTIFICATION IS DENIED; (II) THE CLASS IS DECERTIFIED; OR (III) THE CUSTOMER IS EXCLUDED FROM THE CLASS BY THE COURT. SUCH FORBEARANCE TO ENFORCE AN AGREEMENT TO ARBITRATE SHALL NOT CONSTITUTE A WAIVER OF ANY RIGHTS UNDER THIS AGREEMENT EXCEPT TO THE EXTENT STATED HEREIN. ANY ARBITRATION AWARD SHALL BE FINAL AND BINDING, AND ANY COURT HAVING JURISDICTION MAY ENTER JUDGMENT THEREON.

16. I acknowledge that none of TC Services, Pershing, the Directed Trustee and each service provider will be liable in any way to me or any other person for any inaccuracy, error, or delay in, or omission of any data, information or message or the transmission or delivery of any data, information or message, or any loss or damages arising from or occasioned by: any inaccuracy, error, delay or omission, nonperformance, interruption in data due to neglect or omission by any service provider, any "force majeure" (e.g., loss caused directly or indirectly by flood, fire, war, terrorism, civil unrest, strikes, natural disaster, extraordinary weather conditions, earthquake or other acts of God, government restrictions or actions, interruptions of communications, exchanges or market rulings, suspension of trading or other conditions beyond TC Services, the Directed Trustee, Pershing and/or each service provider's control, failure, or equipment or software malfunction), or any other cause beyond the reasonable control of any service provider.
17. None of TC Services, the Directed Trustee and Pershing shall be liable for any direct, indirect, incidental, special or consequential damages that may arise from its provision of services to me or to my TIAA IRA, including the Account. None of TC Services, the Directed Trustee and Pershing shall be liable for any losses incurred with respect to my investment selection and performance of the assets in my Account, nor shall they have any responsibility for questioning my investment decisions or otherwise inquiring into the merits of my investments. Applicable policies or rules may restrict certain securities from being available for investment in my Account. I alone am responsible for knowing and complying with these restrictions. None of TC Services, the Directed Trustee and Pershing will monitor whether my trading activity is permissible under the Governing Agreements, or consistent with applicable laws, including ERISA, the Internal Revenue Code of 1986 or state law. TC Services,

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the Directed Trustee and Pershing may use and rely upon the services of clearing agencies, automatic data processing vendors, proxy processing, transfer agents, securities pricing services and other similar organizations; in such event, none of TC Services, the Directed Trustee and Pershing shall be responsible for the acts and omissions of such third parties except to the extent that they occur as a result of the gross negligence or willful misconduct of TC Services, the Directed Trustee or Pershing.

- 18.** I understand that my Account includes a sweep program feature, which automatically transfers available uninvested cash balances in my Account at the end of each business day to a money market fund or bank sweep deposit account, if applicable (each a “Sweep Vehicle” and together the “Sweep Program”) and facilitates the redemption of available shares of any such money market funds or the transfer of available cash balances from any such bank sweep deposit accounts to my Account to cover purchases of securities and other debits in my Account. Available Sweep Vehicles vary based on account type. I direct TC Services to use the Sweep Vehicle indicated on my Account Application as the Sweep Vehicle for my Account and, if I fail to indicate a Sweep Vehicle, I direct TC Services to use the default Sweep Vehicle indicated therein. If my account type includes only one Sweep Vehicle, I acknowledge that the Sweep Vehicle set forth in the Account Application will serve as the sweep option in which all available uninvested cash balances in my Account will be allocated at the end of each business day. Different Sweep Vehicles may have different rates of return and different terms and conditions, including but not limited to, requiring minimum cash balances in my Account before such balances may be swept to a Sweep Vehicle. Money market mutual funds are securities that are registered with the U.S. Securities and Exchange Commission (“SEC”) under the Investment Company Act of 1940 and the Securities Act of 1933. Although money market funds attempt to maintain a stable net asset value of \$1 per share, there is no guarantee that the fund will in fact maintain a \$1 per share stable net asset value. Money market funds are not insured by the Federal Deposit Insurance Corporation (“FDIC”). Money market funds are, however, securities subject to protection by the Securities Investor Protection Corporation (“SIPC”) in the event of insolvency of Pershing, LLC as the brokerage firm holding my Account and cash or securities are owed to me. SIPC is a non-profit member corporation funded primarily by member securities brokerage firms registered with the SEC, which protects customers up to certain limits in the event of the failure of a brokerage firm where cash and securities are owed to customers. See the TIAA Brokerage Services SIPC Asset Protection Guide for more information. SIPC does not protect against loss due to market fluctuation or failure of the issuer of a money market fund. More specific information about a particular money market mutual fund, including applicable fund restrictions, fees and expenses and other important information can be found in the fund’s prospectus. Bank sweep options are deposit accounts held at one or more banks. Deposit accounts pay interest on deposits pursuant to the terms and conditions in the disclosure document for the applicable bank sweep option. Interest rates may fluctuate and may vary among banks. Deposit accounts are not subject to SIPC protection. They are subject to FDIC insurance up to applicable limits. FDIC insurance protects against loss of deposit amounts in the event the bank holding the deposits fails. More specific information about particular bank sweep options, including applicable FDIC insurance limits, interest amounts and other important information can be found in the applicable bank sweep disclosure document. Prospectuses or similar disclosure documents for the Sweep Vehicle option(s) available for my Account are available by calling **800-842-2252**. I agree to review these disclosure documents prior to opening my Account. I understand that TC Services may change the terms and conditions of the Sweep Program and the Sweep Vehicle options available for my Account, in its sole discretion. TC Services will provide me with written notice in advance of adding, changing or deleting Sweep Vehicle options for my Account or making other changes to the Sweep Program to the extent required by applicable law.

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19. For the parties mutual protection, I understand, agree and expressly consent to the electronic recordation of any of my telephone conversations with TC Services and to our monitoring of my electronic communications with TC Services, including but not limited to email and facsimile transmissions. I acknowledge that when I change any instruction on a limit order, I am responsible for any open order and any actions by me that modify or impact an open order. If I fail to take action, I understand that I will be responsible for any losses, including applicable commission charges. I am responsible for knowing the status of my pending orders and any duplication by me of a pending order will be considered authorized by me.
20. I acknowledge that federal law requires that TC Services verify my identity by obtaining, among other information, my name, date of birth, address and government-issued identification number before opening my Account. This information is necessary to help the government fight the funding of terrorism and money laundering activities. TC Services may gather and verify this information with respect to any other person authorized to effect transactions in my Account. TC Services may restrict and/or close my Account if TC Services cannot verify this information. TC Services will not be responsible for any losses resulting from my failure to provide this information, or from any related restriction or closing of my Account.
21. I acknowledge that if any provision or condition of this Agreement is held invalid or unenforceable for any reason by any court, regulatory or self-regulatory agency or body, such provision or condition shall be fully severable, and this Agreement shall be enforced and construed as if such provision or condition had never comprised a part of this Agreement. I acknowledge that to deter frequent trading within mutual funds, a short-term redemption fee may be assessed, as provided in the Commission and Fee Schedule attached hereto. This fee is in addition to any short-term redemption fee or restriction the underlying mutual fund may independently assess against the same transaction. Each of TC Services, the Directed Trustee and Pershing reserves the right to restrict access to the purchase of mutual fund shares within any account deemed at their sole discretion to engage in excessive or abusive short-term trading patterns. Additionally, in the event Pershing or Directed Trustee, as the case may be, is instructed by the issuer of a mutual fund to restrict my access to such mutual fund's shares, such a restriction may remain in place until Pershing or Directed Trustee receives notice from the issuer to remove the restriction.
22. I acknowledge that TC Services will send all communications to me at the mailing address I provide on my Account Application, or at such other address as I may subsequently provide to TC Services in writing, and that all communications so sent shall be deemed properly delivered, whether actually received by me or not. I acknowledge that I have a duty to timely review any confirmations or Account statements for accuracy. I am responsible for notifying TC Services, Pershing, and/or the Directed Trustee immediately of any error or omission. If I fail to notify TC Services, Pershing and/or the Directed Trustee of any error or omission within this time frame, the brokerage account statement and confirmations shall be presumed accurate.
23. I acknowledge that this Agreement constitutes the full and entire understanding between the parties with respect to the provisions herein, and that there are no oral or other agreements in conflict herewith. I acknowledge that each of TC Services, the Directed Trustee and Pershing reserves the right to amend this Agreement by modifying or rescinding any of its existing provisions or by adding any new provision at any time upon written notice to me on my brokerage account statement(s), trade confirmation(s), or such other written or electronic notification, including but not limited to posting notice of such amendment(s) and/or the amended Agreement on the TC Services brokerage website. The amended Agreement will be effective as of the date established by TC Services, the

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Directed Trustee and Pershing (the “Effective Date”). I agree that any future amendments made to the Agreement shall apply to my Account and to any subsequent Accounts I ask TC Services to establish for me in the future. The use of my Account after the Effective Date of the amendment(s) shall constitute my acknowledgement and agreement to be bound thereby. I am responsible for regularly checking for any updates. I understand additional restrictions may apply to the brokerage services provided hereunder and additional documentation may be required by applicable law or TC Services, the Directed Trustee and Pershing’s policies and procedures. I agree to comply with any such restrictions and promptly provide any documents or information requested.

24. I acknowledge that use of the telephone, Internet or any other electronic system and software provided for use in accessing my Account information, is used at my sole risk. I further acknowledge that none of TC Services, the Directed Trustee and Pershing and any of their vendors providing data, information or other services, including but not limited to any exchange (collectively, “service providers”), warrant that the service will be uninterrupted or error free and that TC Services, the Directed Trustee and Pershing do not make any warranty as to the results that may be obtained from any of these systems. I further acknowledge that the telephone, Internet and other electronic systems are provided on an as-is and as available basis, without warranties of any kind, either expressed or implied, including, without limitation those of merchantability and fitness for a particular purpose, other than those warranties which are implied by and incapable of exclusion, restriction or modification under the laws applicable to this Agreement. No service provider will be liable in any way to me or any other person for inaccuracy, error, delay in, or omission of any data, information, or message, or the transmission or delivery of any data, information or message, or any loss or damages arising from or occasioned by: any inaccuracy, error, delay or omission, nonperformance, interruption in data due to neglect or omission by any service provider, any “force majeure” (e.g. loss caused, directly or indirectly by flood, fire, war, terrorism, civil unrest, strikes, natural disaster, extraordinary weather conditions, earthquake or other acts of God, government restrictions or actions, interruptions of communications, exchanges or market rulings, suspension of trading or other conditions beyond TC Services, the Directed Trustee, Pershing and/or each service provider’s control, failure, or equipment or software malfunction), or any other cause beyond the reasonable control of any service provider.
25. TIAA Brokerage and Pershing, in their capacity as clearing firm, may make the account communications available in an electronic form instead of mailing them in paper form; according terms and conditions stated within the Electronic Delivery Terms and Conditions.
26. I acknowledge receipt of the TIAA Privacy Notices.
27. I acknowledge that complaints regarding my Account are to be mailed to: TIAA Brokerage, 8500 Andrew Carnegie Blvd., Charlotte, North Carolina 28262, or I may call **800-842-2252**.
28. You agree that TIAA may assign this Agreement (in part or in full, and including assigning the role of clearing broker and custodian for the Account) to any third-party or any subsidiary, affiliate or successor of TIAA. You hereby delegate and grant to TIAA the power and authority to make these changes on your behalf. TIAA will provide you with at least 30 days prior written notice of such assignment and you will be deemed to have consented to the assignment if you conduct any transactions in your Account or keep your Account open subsequent to receiving such a notice.

II. Trusted Contacts

TIAA is committed to helping you protect your account(s) and information. One way to protect your interests is to appoint a Trusted Contact. A Trusted Contact is someone over the age of 18 whom you know and trust. This person will serve as a point of contact should we have questions concerning your overall well-being, whereabouts, or if we suspect you may be the victim of fraud or exploitation. The individual(s) you select may not take any action on your account and will not replace or affect existing powers of attorney. You should notify those you appoint as Trusted Contacts.

To appoint your Trusted Contact(s), log into your account at **TIAA.org**, click *Profile* at the top of the page. Within *More profile options*, click *Trusted Contacts* and complete the required Trusted Contact information, or contact us at **800-842-2252** to request a form to name a Trusted Contact.

Please note that TIAA, and its affiliates and representatives, are authorized to contact the Trusted Contact(s) and disclose information about your account(s) to address possible financial exploitation, to confirm the specifics of your current contact information, health status, or the identity of any legal guardian, executor, trustee, or holder of a power of attorney, or as otherwise permitted under FINRA Rule 2165. Except as is required by FINRA Rule 2165, TIAA is under no obligation to interact with Trust Contacts.

III. Role of Pershing

TC Services retained Pershing to act as a clearing broker for TC Services and provide certain recordkeeping and operational services, which may include execution and settlement of securities transactions, custody of securities and cash balances, and extension of credit on margin transactions. These services are provided under a written Clearing Agreement between Pershing and TC Services. The respective roles of Pershing and TC Services, as defined within the Clearing Agreement, are outlined below.

1. In general, Pershing is only responsible for those services provided at the request or direction of TC Services as contemplated by the Clearing Agreement.
2. Pershing will create computer-based Account records on the account holder's behalf in such name(s) and with such address(es) as TC Services directs.
3. Pershing will process orders for the purchase, sale or transfer of securities for the Account as TC Services directs. Pershing is not obligated to accept orders for securities transactions directly from the account holder and will do so only in exceptional circumstances.
4. Pershing will receive and deliver cash and securities for the Account and will record such receipts and deliveries according to information provided either by TC Services or directly, in writing, by the account holder. Pershing is the only recipient of cash or checks for the Account by the account holder.
5. Pershing will hold in custody securities and cash received for the Account, and will collect and disburse dividends and interest and process reorganization and voting instructions with respect to securities held in custody. Pershing is responsible for the custody of cash and securities only after it comes into Pershing's physical possession or control.
6. Pershing will prepare and transmit to the account holder or provide facilities to TC Services for the preparation and transmission of confirmations of trades. Pershing will prepare and transmit to the account holder periodic account statements summarizing the transaction history.

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7. In connection with all of the functions that Pershing performs, Pershing maintains the books and records required by law and by business practice. Pershing will provide TC Services with written reports of all transactions processed for the Account to enable it to carry out its responsibilities under the Clearing Agreement. Pershing will assist the account holder and TC Services with any discrepancies or errors that may occur in the processing of transactions for the Account.
8. PERSHING DOES NOT CONTROL, AUDIT OR OTHERWISE SUPERVISE THE ACTIVITIES OF TIAA OR ITS EMPLOYEES. PERSHING DOES NOT VERIFY INFORMATION PROVIDED BY TIAA REGARDING THE ACCOUNT OR TRANSACTIONS PROCESSED FOR THE ACCOUNT NOR UNDERTAKE RESPONSIBILITY FOR REVIEWING THE APPROPRIATENESS OF TRANSACTIONS ENTERED BY TIAA ON THE ACCOUNT HOLDER'S BEHALF. PERSHING MAY ACCEPT FROM TIAA, WITHOUT INQUIRY OR INVESTIGATION, (I) ORDERS FOR THE PURCHASE OR SALE OF SECURITIES, AND (II) OTHER INSTRUCTIONS CONCERNING YOUR ACCOUNTS. PERSHING SHALL NOT BE RESPONSIBLE OR LIABLE FOR ANY ACTS OR OMISSIONS BY TIAA OR ITS EMPLOYEES. YOU UNDERSTAND THAT PERSHING PROVIDES NO INVESTMENT ADVICE NOR DOES PERSHING GIVE ADVICE OR OFFER ANY OPINION WITH RESPECT TO THE SUITABILITY OF ANY TRANSACTION OR ORDER. YOU UNDERSTAND THAT TIAA IS NOT ACTING AS THE AGENT OF PERSHING AND YOU AGREE THAT YOU WILL IN NO WAY HOLD PERSHING, ITS OTHER DIVISIONS, AND ITS OFFICERS, DIRECTORS AND AGENTS LIABLE FOR ANY TRADING LOSSES INCURRED BY YOU. YOU AUTHORIZE PERSHING TO ACT AS YOUR AGENT TO PURCHASE AND REDEEM FOR YOUR ACCOUNT SHARES OF THE FUNDS, AS PREVIOUSLY DEFINED, AND YOU AGREE THAT YOU SHALL NOT HOLD PERSHING, ITS OTHER DIVISIONS, AFFILIATES, OFFICERS, DIRECTORS OR AGENTS LIABLE FOR ANY TRADING LOSSES INCURRED.
9. The Clearing Agreement does not encompass transactions in commodities futures contracts or investments other than marketable securities, which Pershing normally processes on recognized exchanges and over-the-counter markets.
10. In furnishing its services under the Clearing Agreement, Pershing may use and rely upon the services of clearing agencies, automatic data processing vendors, proxy processing, transfer agents, securities pricing services and other similar organizations.
11. This statement addresses the basic allocation of functions regarding the handling of the Account. It is not meant as a definitive enumeration of every possible circumstance, but only as a general disclosure.

IV. Commission and fee schedule

Equities and Exchange-Traded Funds (ETFs) (All commissions and fees are per transaction, unless otherwise indicated.)			
	Online/Mobile TIAA.org/brokerage	Automated Telephone System (ATS) 800-842-2252	Client Service Assistance 800-842-2252
Equity and Transaction-Fee ETFs	No charge	\$35	\$55
No-Transaction Fee (NTF) ETFs	<ul style="list-style-type: none"> NTF eligible ETFs will have a \$0.00 commission, regardless of order size or holding period. Any ETF shares purchased prior to January 26, 2018, and are now identified as a No Transaction Fee ETF, will still be charged a commission when the shares are sold, when placing the trade through the ATS or Client Service Assistance. A commission will be charged for NTF ETFs sold prior to settlement. 		
Equity Notes	<ul style="list-style-type: none"> Fees shown reflect stock prices greater than \$1 per share. Orders to buy shares priced under \$1, restricted shares, non-permitted Cannabis Related Business (CRB) securities, foreign securities, privately held securities, shares without a market price or no bid/ask will not be accepted. Orders to sell shares priced under \$1 are handled via Client Service Assistance at the online commission rate above, based on eligibility. 		
Financial Transaction Tax (FTT) Ordinary and ADR	<p>All opening transactions in FTT-eligible companies from the following countries will be subject to the FTT tax rate:</p> <ul style="list-style-type: none"> French FTT at a rate of 0.30% of the total transaction cost. Italian FTT at a rate between 0.10% and 0.20% of the total transaction cost. Spanish FTT at a rate of 0.20% of the total transaction cost. 		
ADR Agent Servicing Fee	<ul style="list-style-type: none"> Fee will generally range from \$0.01 - \$0.03 per share. Amounts will differ by ADR. Please refer to the ADR prospectus for specific fee and other information. 		
Securities and Exchange Commission (SEC) Section 31 Transaction Fee	<ul style="list-style-type: none"> Varies per transaction. Visit SEC.gov for the current rate. 		

Fixed income (Bonds and CDs are available for purchase online. For assistance, call 800-842-2252.)	
U.S. Treasury Securities	
New issues (primary, at auction)	\$50 per transaction
Existing issues (secondary, already trading)	\$1 per \$1,000 face amount (\$50 minimum)
Other Fixed Income	
Municipal Bonds, Government Agency Bonds, Unlisted (Over-the-counter, or OTC) Corporate Bonds, and Mortgage-backed Securities ¹	\$50 + \$2 per bond
Certificates of Deposit—New Issues	Purchase minimums of \$5,000, no commission (interest rate reflects issuing bank's fee)

- TIAA may execute certain fixed-income transactions for your Account on either an agency or principal basis. If we execute on an agency basis, the commissions listed above will apply. If we execute on a principal basis, we will sell a fixed-income product to you (or buy it from you), which we contemporaneously purchase from (or sell to) a dealer. If so, the net compensation earned by TIAA will include a mark-up. If we sell a fixed-income product to you, the mark-up is the difference between the sales price to you and the price we pay to purchase the product from a dealer. If we buy a fixed-income product from you, the mark-up is the difference between the sales price to the dealer and the price we pay to purchase the security from you.

IV. Commission and fee schedule (continued)

Options (All commissions and fees are per transaction, unless otherwise indicated.)			
	Online/Mobile TIAA.org/brokerage	Automated Telephone System (ATS) 800-842-2252	Client Service Assistance 800-842-2252
Commissions and Fees	No charge	\$35 + \$2.00 per contract	\$55 + \$2.50 per contract
Options Exercise/Assignment	\$25	\$25	\$25
Options Regulatory Fee	Varies by contract. Visit https://www.theocc.com for the current fee schedule.		

Mutual Funds	
No-Transaction-Fee (NTF) funds	<ul style="list-style-type: none"> ▪ Minimum initial investment for NTF mutual funds: The greater of either the listed amount in the fund's prospectus or \$500. Purchases below the stated minimum will be charged the appropriate transaction fee. ▪ Additional investments of NTF funds: The greater of either the listed amount in the fund's prospectus or \$100. Transactions of NTF funds for amounts less than \$500 will be subject to the appropriate transaction fee. Systematic (automatic recurring or dollar cost averaging) orders are excluded. ▪ Systematic (automatic recurring or dollar cost averaging) orders, no fee; minimum transaction of \$100. ▪ Short-term redemption fee: \$50 minimum for shares held less than six months (waived for shares transferred from another brokerage firm or financial institution). Additional redemption fees may apply as set forth in each fund's prospectus.
Transaction-Fee (TF) funds	<ul style="list-style-type: none"> ▪ Transaction fee, regardless of order size: <ul style="list-style-type: none"> – \$50 per trade – \$35 per trade for customers that receive a financial planning solution from their Wealth Management advisor. ▪ Minimum initial investment for mutual funds: The greater of either the listed amount in the fund's prospectus or \$500. ▪ Additional investments: The greater of either the listed amount in the fund's prospectus or \$100. ▪ Systematic (automatic recurring or dollar cost averaging) orders, no fee; minimum transaction of \$100.

Account maintenance fees (All fees are per transaction, unless otherwise indicated.)	
Account research	\$20 per hour
ACH return fee	\$25
Alternate Investment Transaction/Processing Fee	\$50
Certificate cancellation fee for certificates deposited outside of the transfer agent	\$3+ (pass-through fee, varies by transfer agent)
Custody safekeeping fee for physical securities (Excludes ADRs held with domestic custodian bank)	\$10 per account, per position, per month
Direct Registration System (DRS) incoming transfer fee—shares sent directly from some transfer agents	\$15-\$20 (pass-through fee, varies by transfer agent)
Direct Registration System (DRS) outgoing transfer fee—shares sent directly back to the transfer agent*	\$30 per security, per account

IV. Commission and fee schedule (continued)

Account maintenance fees (continued)

(All fees are per transaction, unless otherwise indicated.)

Foreign Account Fee (Non-US address)	\$50 per year for each account that maintained a balance, position or had a form 1042-S reportable transaction
Foreign securities	Up to \$125 for each order (not applicable to American Depositary Receipts) + transaction fees and commission
Foreign security receive and deliver fee	\$75
Incoming account transfer/IRA termination/account closure fee	Varies by sender (pass-through fee)
International overnight check delivery fee	\$28
IRA termination fee**	\$130
Margin extensions	\$15
NSF/return check deposit fee	\$25
Outgoing wired funds fee	\$25
Overnight check delivery fee	\$12
Post-effective reorganizations—Voluntary	\$75
Reorganizations—Voluntary	\$25
Saturday delivery—overnight check delivery fee	\$18
Special product fee—Registered REITs	\$35 per position, charged at transfer and then annually
Special product fee—Unregistered REITs	\$125 per position, charged at transfer and then annually
Stop-payment order fee	\$15
Transfers of gifted securities or checks mailed regular delivery*	No charge
Transfers—Accommodation*	\$80 per transfer
Transfers—Automated Clearing House (ACH)	No charge
Transfers—GNMA, Restricted, Legal*	\$140 per transfer
Transfers—Outgoing full account*	\$50 per transfer, no charge for partial transfers
Transfers—Register, transfer and ship*	\$80 per transfer, plus any third-party charges, including a DTCC charge of \$500
Unrelated Business Taxable Income (UBTI) Tax Return (IRS Form 990-T) Processing	\$200 per tax return filed

* Checks in the amount of \$250,000 or more for transfers or payments will be sent via overnight delivery and a delivery fee of \$12 will be charged to the account.

** Termination fee does not apply to the TIAA IRA self-directed brokerage account, or if the assets from a TIAA IRA account are transferred to a new or existing TIAA IRA account.

Foreign currency deposit fee “Free credit balance interest charge”

(Monthly rate subject to change. Call TIAA Brokerage for current rates.)

Currency	Rate for balance below daily exception balance	Daily exception balance	Rate for balance above daily exception
Swiss Franc (CHF)	2.00%	\$100,000	4.25%
Danish Krone (DKK)	1.30%	\$1,000,000	1.80%
Swedish Krona (SEK)	.85%	\$2,000,000	1.25%
Euro (EUR)	.80%	\$86,000	1.05%
Japanese Yen (JPY)	.40%	\$100,000,000	.65%

TIAA Brokerage, a division of TIAA-CREF Individual & Institutional Services, LLC, Member FINRA and SIPC, reserves the right to change this fee and commission schedule at its discretion, subject to notification in accordance with applicable laws and regulations.

TIAA-CREF Individual & Institutional Services, LLC, Member FINRA and SIPC, distributes securities products. TIAA Brokerage, a division of TIAA-CREF Individual & Institutional Services, LLC, Member FINRA and SIPC, distributes securities. Brokerage accounts are carried by Pershing, LLC, a subsidiary of The Bank of New York Mellon Corporation, Member FINRA, NYSE, SIPC.

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