

Return by mail:
 Putnam Investor Services, Inc.
 P. O. Box 8383
 Boston, MA 02266-8383

Return by express delivery:
 Putnam Investor Services, Inc.
 30 Dan Road
 Canton, MA 02021-2809

For more information:
 Putnam Investments
 1-800-225-1581
 www.putnam.com

Please make checks payable to Putnam Fiduciary Trust Company



Use this form to open a new Putnam Traditional IRA or Putnam Roth IRA.

Section 1 Plan type

Select the account type you want to establish. Please complete a separate Traditional or Roth IRA adoption agreement to establish additional plan types.

- Traditional IRA
 Roth IRA
 Traditional IRA for a minor
 Roth IRA for a minor

Section 2 Complete your account owner information

Name of account owner

First	MI	Last	Suffix	Social security number (required)	Date of birth (mm/dd/yyyy; required)
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

Name of parent/guardian (required only if you are opening an IRA for a minor)

First	MI	Last	Suffix	Social security number (required)	Date of birth (mm/dd/yyyy; required)
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

Contact phone number

E-mail address

Note: Providing an e-mail address and/or phone number above will replace the current contact information on file with Putnam (if applicable). No changes will be made for fields that are left blank. If you are enrolled in electronic delivery, all notifications will be sent to the e-mail address listed above.

Electronic delivery of account documents

- I want to **"GO GREEN"** and reduce paper, printing and mailing by receiving documents electronically.

By checking the "GO GREEN" box above, an e-mail will be sent to the e-mail address provided above with a link to Putnam's secure Investor Website, which will allow you to choose your eDelivery options. Documents available for eDelivery include transaction confirmations, quarterly statements, prospectuses, annual/semiannual fund reports, proxy statements, and tax forms. When a new document is available, instead of sending the document to you by U.S. mail, Putnam Investor Services will send you an e-mail notification that the document is available via Putnam's Website. Terms and Conditions related to eDelivery will be provided to you prior to confirmation of your elections.

Mailing address (required)

Street

City State ZIP code

Residential address (Required if mailing address is a P.O. Box or c/o address)

Street

City State ZIP code

Section 6 Designate your beneficiary(ies)

Complete Sections 6A and 6B to designate primary and contingent beneficiaries respectively for assets payable upon your death. For each beneficiary, PFTC requires the full name, tax identification number, and date of birth. If you name multiple primary or contingent beneficiaries, please specify the percentage each is to receive. If no percentage is specified, your account will be divided among your surviving primary beneficiaries in substantially equal amounts. If no primary beneficiaries survive you, your account will be divided among your surviving contingent beneficiaries. If none of your designated beneficiaries survive you, your account will be distributed according to the provisions of the IRA plan and disclosure statement.

Important: PFTC does not accept customized beneficiary designations (for example, designations which involve multiple contingencies within a primary or contingent beneficiary category) or "per stirpes" designations. All beneficiaries must be designated as either primary or contingent and must include all identifying information referenced above. PFTC generally cannot accept beneficiary designations from attorneys-in-fact, conservators, or guardians. If the designated beneficiaries are not accepted by PFTC the provisions of the IRA plan disclosure statement will be in effect.

6A: Primary beneficiary(ies):

Percentages for **primary** beneficiaries **must equal 100%**. For any additional **primary** beneficiary designations, attach a separate page which contains all required information for each beneficiary.

Name of individual (First, MI, Last)/Full name of entity/trust

Tax identification number (required)

Date of birth (mm/dd/yyyy; required)

Residential address (Street, City, State, ZIP Code)

Relationship

Spouse Non-spouse Entity/Trust

Percentage

 . %

Name of individual (First, MI, Last)/Full name of entity/trust

Tax identification number (required)

Date of birth (mm/dd/yyyy; required)

Residential address (Street, City, State, ZIP Code)

Relationship

Spouse Non-spouse Entity/Trust

Percentage

 . %

Name of individual (First, MI, Last)/Full name of entity/trust

Tax identification number (required)

Date of birth (mm/dd/yyyy; required)

Residential address (Street, City, State, ZIP Code)

Relationship

Spouse Non-spouse Entity/Trust

Percentage

 . %

Name of individual (First, MI, Last)/Full name of entity/trust

Tax identification number (required)

Date of birth (mm/dd/yyyy; required)

Residential address (Street, City, State, ZIP Code)

Relationship

Spouse Non-spouse Entity/Trust

Percentage

 . %

100%

Section 6 Designate your beneficiary(ies) (continued)

6B: Contingent beneficiary(ies):

Percentages for **contingent** beneficiaries **must equal 100%**. For any additional **contingent** beneficiary designations, attach a separate page which contains all required information for each beneficiary.

Name of individual (First, MI, Last)/Full name of entity/trust

Tax identification number (required)

Date of birth (mm/dd/yyyy; required)

Residential address (Street, City, State, ZIP Code)

Relationship

Spouse Non-spouse Entity/Trust

Percentage

 . %

Name of individual (First, MI, Last)/Full name of entity/trust

Tax identification number (required)

Date of birth (mm/dd/yyyy; required)

Residential address (Street, City, State, ZIP Code)

Relationship

Spouse Non-spouse Entity/Trust

Percentage

 . %

Name of individual (First, MI, Last)/Full name of entity/trust

Tax identification number (required)

Date of birth (mm/dd/yyyy; required)

Residential address (Street, City, State, ZIP Code)

Relationship

Spouse Non-spouse Entity/Trust

Percentage

 . %

Name of individual (First, MI, Last)/Full name of entity/trust

Tax identification number (required)

Date of birth (mm/dd/yyyy; required)

Residential address (Street, City, State, ZIP Code)

Relationship

Spouse Non-spouse Entity/Trust

Percentage

 . %

100%

6C: Signature of IRA owner's spouse (if applicable):

If you are married to the IRA owner and he or she has designated a beneficiary(ies) other than you, please consult your financial advisor about the state law and tax law implications of this beneficiary designation, including the need for your consent. By signing below you indicate that you are the spouse of the individual named in Section 2 and that you consent to the designated beneficiary(ies). PFTC is not responsible to determining whether an account owner is married and is a resident of a jurisdiction in which community property rules apply.

Signature of spouse

Date (mm/dd/yyyy)

Print name of signature above

Section 7 Select your account features (optional)

Section 7A — Bank account information (You must provide a voided check or deposit slip; please do not staple)

Note: Starter checks, brokerage checks, and checkwriting checks will not be accepted.

Please provide your bank information to allow subsequent purchases to be sent from your bank account. If the Putnam account owner's name is listed in the bank account registration, you will then be eligible for ACH on-demand purchasing via phone or web.

Attach a preprinted or web-generated voided check/deposit slip or a signed letter from the bank on bank letterhead below. Each of these documents must include: bank name, name(s) as registered on the bank account, routing number and account number.

Check the bank account you would like to use: Checking account Savings account

Please use my enclosed investment check to establish bank account options on my account in lieu of other acceptable documents named above.

tape your document here

Name _____
 Address _____
 City, State, ZIP _____

DATE _____

PAY TO THE ORDER OF _____ \$ _____
 _____ DOLLARS

memo: _____

|: 123456789 |: 000123456789 |: 101

ABA routing number of financial institution

Bank account number

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Section 7B — Systematic investment plan

Complete this section to establish a new systematic investment plan using the bank account information provided above. Please indicate the fund number, fund name, dollar amount, frequency and date for your investments below. Investments will be made into the same share class selected in Section 5 unless otherwise indicated (systematic investments will always be coded for the current contribution year). Putnam requests the draft from your bank account on the business day prior to the investment date. **If no date is selected, Putnam will default to the 15th.** If the investment date falls on a weekend or a holiday, the investment will be made the next business day. If the investment date falls on a date that does not occur within a particular month (29th-31st), the investment will be made the prior day, unless this day falls on a weekend or holiday then the investment will be made the next business day.

Step 1: Investment allocation

Fund number	Fund name	Dollar amount
_ _ _ _		\$ _ _ _ _ _ _ _
_ _ _ _		\$ _ _ _ _ _ _ _
_ _ _ _		\$ _ _ _ _ _ _ _
_ _ _ _		\$ _ _ _ _ _ _ _

Step 2: Option frequency

Choose a frequency below. Putnam will default to once per month if no option is selected:

Frequency: Invest every month (enter investment date(s) below) **or** Invest only in the month(s) chosen below:

Jan Feb Mar Apr May June July Aug Sept Oct Nov Dec

Indicate draft date(s) below:

Investment date: Additional investment date: (use if you wish to invest multiple times within a month)
 (MM/DD) (DD)

_ _ _ _	_ _
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Note: Contributions cannot be made into a Traditional IRA for the year in which the shareholder reaches the age of 70½ or for any year thereafter. Putnam will automatically stop the systematic investment plan for all Traditional IRA accounts upon the start of the year that the client will attain the age of 70½.

Section 7 Select your account features (optional)(continued)

Section 7C — Reduced sales charge

If you already own shares of another Putnam fund, or if you agree to invest a certain amount, you may be able to reduce the sales charge you pay.

CUMULATIVE DISCOUNT

To qualify for sales charge discounts on class A and M shares, list the account number(s) of other Putnam fund(s) that you or your family (spouse and/or children under age 21) own.

Fund number	Account number
<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>

LETTER OF INTENT

By checking an amount below, I agree to the terms and conditions for a Letter of Intent as set forth in the Statement of Additional Information (including the escrowing of shares). Although I am not obligated to complete a Letter of Intent, I plan to invest in one or more Putnam funds over a 13-month period an aggregate amount equal to at least the amount of the box checked below. I am aware that if I do not invest at least this amount over a 13-month period any purchases made pursuant to this Letter of Intent will be adjusted to the commission rate that otherwise would apply.

- \$50,000 \$100,000 \$250,000
 \$500,000 \$1,000,000

Section 8 Traditional or Roth IRA agreement

I do not authorize telephone redemptions. Accept only written instructions signed by me.

Unless I have checked the box above, Putnam Investor Services, Inc. is authorized to act upon redemption instructions received by telephone from me or any other person claiming to act as my representative who can provide Putnam with my account registration and address as it appears on Putnam's records. Redemption proceeds of up to \$100,000 will be sent to me at an address on record with Putnam for at least 15 days. Putnam will not be liable for unauthorized transactions if it employs reasonable procedures to confirm that instructions received by telephone are genuine. I agree to indemnify and hold harmless Putnam Investor Services, Inc. and any Putnam funds that may be involved in transactions authorized by telephone against any claim or loss in connection with any telephone transaction effected on my account.

I do not authorize the mailing of only one shareholder report, one prospectus, or one set of proxy materials if there are multiple accounts in a Putnam fund at my address. Send a separate copy for every account.

Unless I have checked the box above, Putnam Investor Services, Inc. is authorized to send only one shareholder report, one prospectus, or one set of proxy materials for **all** accounts in any Putnam fund at my address.

Important notice regarding Putnam's privacy policy: By signing this application, I acknowledge that Putnam's privacy policy is available for viewing and printing via Putnam's website at <https://www.putnam.com/policies/>

If I/we have completed the bank account information in Section 7, I/we authorize my/our bank/credit union to accept debit/credit entries initiated by Putnam Investor Services to my/our account and to debit/credit, as requested, the same to my/our account, without responsibility for correctness thereof or for the existence of any further authorization relating thereto. I/we hereby acknowledge that the initiation of an ACH transaction through Putnam is to purchase securities, and accordingly any transaction requested by me/us through the ACH system is irrevocable. I/we authorize Putnam to make a follow-up attempt in retrieving those monies which are denied due to insufficient funds (i.e. systematic purchase bounce). I/we agree to indemnify and hold harmless my/our bank/credit union, the Putnam funds, and Putnam Investor Services for any loss, liability, or expense incurred from acting on these instructions. I/we also agree to waive any right under the NACHA Rules to rescind any instruction for ACH transactions which have already occurred at the time of the attempt to rescind. This waiver of the rescission right applies to both ACH investments in and ACH redemptions from the Putnam Funds. This authorization may be terminated by me/us at any time by written notification to Putnam Investor Services, with reasonable time given to implement my/our request. Putnam Investor Services may amend or terminate this agreement at any time. You will be notified before any such changes go into effect. For bank account information (Section 7), Putnam does not assess a fee for federal bank wire and/or ACH transactions on your account(s). Some banks/credit unions may not offer ACH transactions or may charge a fee to conduct such transactions. Please check with your financial institution for information regarding eligibility, fees and applicable routing number(s) for federal bank wire and/or ACH transactions.

If I have completed a Letter of Intent (LOI) in Section 7, I agree that the minimum initial investment, which will be held in escrow until the full LOI amount is purchased, is 5% of the amount checked. If I invest less than the LOI amount, shares may be redeemed from my account to cover the higher sales charge. If I invest more, the sales charge will only be adjusted when and if my dealer refunds Putnam its portion of the adjustment. I will not receive LOI credit for shares purchased by dividend reinvestment.

If applicable, the Parent/Guardian named in Section 2 represents that he or she is the parent or legal guardian of the property of the Owner/Minor indicated above. Notwithstanding any provision of the Adoption Agreement or Plan, PFTC may rely on instructions of the Parent/Guardian with respect to the administration, investment and distribution of the Account until the Owner/Minor reaches the age of majority in his or her State of residence. The Parent/Guardian agrees that he or she shall cease to have any authority or control with respect to the Account upon attainment of the age of majority by the Owner/Minor. Thereafter, the Owner/Minor shall be treated as the Owner for all purposes under the Adoption Agreement and Plan. Notwithstanding the foregoing, the Parent/Guardian agrees that Putnam Fiduciary Trust Company ("PFTC") shall have no responsibility or obligation to determine whether the Owner/Minor has attained the age of majority. Prior to executing any direction or request made by the Parent/Guardian or the Owner/Minor, PFTC may require the Parent/Guardian or the Owner/Minor to demonstrate in a manner satisfactory to PFTC whether the Owner/Minor has attained the age of majority. The Parent/Guardian hereby agrees to indemnify and hold harmless Putnam Fiduciary Trust Company, Putnam Investor Services, and their respective affiliates, agents, directors, officers, and employees (collectively, "Putnam"), from and against any loss, damage, liability, claim, cost or expense, including legal fees, which Putnam incurs as a result of, or in connection with, any actual or attempted disaffirmance, voiding, reversal, unenforceability, cancellation or limitation of any purchase, exchange, transfer or redemption of assets held in the Account by reason of, or in connection with, the Owner/Minor's status as a minor or the Parent/Guardian's status as a person other than the Owner/Minor's parent or legal guardian. This agreement is binding on the Parent/Guardian and his or her executors, beneficiaries, heirs, administrators, legal representatives and assigns, and will inure to the benefit of Putnam and its successors and assigns. This agreement shall survive termination of the Adoption Agreement.

Section 8 Traditional or Roth IRA agreement (continued)

I hereby (I) adopt The Putnam Traditional IRA Plan or The Putnam Roth IRA Plan (the "Plans"), as indicated in Section 1 of this form, as an individual retirement account under Section 408(a) or 408A of the Internal Revenue Code of 1986, as amended; (II) acknowledge receipt of the Plan and Disclosure Statement; (III) have received and have read a current prospectus of any fund; (IV) appoint **Putnam Fiduciary Trust Company** as Trustee; (V) acknowledge that the terms in this agreement mean the same as in the Plan; and (VI) agree that an annual maintenance fee of \$25 will automatically be deducted from the account in accordance with Putnam's annual maintenance fee policy for all accounts with a balance below \$50,000 on the day the fee is scheduled to be taken. I also acknowledge that Putnam's annual maintenance fee policy is subject to change. I also certify under the penalties of perjury that the taxpayer identification number (Social Security number) set forth in Section 2 is true, correct, and complete.

In accordance with federal law, the Putnam funds are required to obtain the name, residential or business address, Social Security or tax identification number, and date of birth for each registered owner in order to verify their identities. For certain entities such as trusts, estates, corporations, partnerships, or other organizations, additional documentation may be required (see the following terms and conditions or call Putnam at 1-800-225-1581). The funds are unable to accept new accounts if any required information is not provided. If the funds are unable to verify your identity, your account will be closed at the then-current NAV, which may be more or less than your original investment, and the proceeds will be sent to you, net of any applicable sales charges. With respect to any such distribution, I elect that no amount be withheld for federal income taxes due on the taxable part of any such distribution, and I acknowledge that I can incur penalties if my withholding or estimated tax payments for the year are not sufficient. I further understand that under federal tax law I will have 60 days from date of receipt by me to roll over such distribution to another IRA or eligible plan that will accept it. I will consult my professional tax advisor if I have any questions about the tax consequences of any such distribution.

The information you provide may be shared with third parties for the purpose of verification subject to the terms of Putnam's privacy policy.

Signature of owner/parent/guardian/authorized signer

Date (mm/dd/yyyy)

Print name of signature above

SIGNATURE OF CONTRIBUTOR OR BANK ACCOUNT OWNER

If the checking or savings account indicated in Section 7 is not that of the Putnam account owner, an individual whose name appears on the bank account registration must sign below (only one bank account owner must sign).

Signature of bank account owner (if different from the Putnam account owner)

Date (mm/dd/yyyy)

Print name of signature above