

MassMutual Artistry Variable Annuity

Issued by Massachusetts Mutual Life Insurance Company

Massachusetts Mutual Variable Annuity Separate Account 4

This prospectus describes the MassMutual Artistry individual certificates issued under a deferred group variable annuity contract offered by Massachusetts Mutual Life Insurance Company. We no longer sell the certificate. However, we continue to administer existing certificates. The certificate provides for accumulation of certificate value and annuity payments on a fixed and/or variable basis.

You, the participant, have a number of investment choices in the certificate. These investment choices include one fixed account option and one or more variable investment divisions (sub-accounts) of Massachusetts Mutual Variable Annuity Separate Account 4 (separate account). Each sub-account, in turn, invests in one of the following investment entities (funds). You bear the entire investment risk for all amounts you allocate to a sub-account.

AIM Variable Insurance Funds (Invesco Variable Insurance Funds)

Invesco V.I. Diversified Dividend Fund
Invesco V.I. Health Care Fund
Invesco V.I. Technology Fund

Fidelity® Variable Insurance Products Fund

Fidelity® VIP Contrafund® Portfolio

MML Series Investment Fund

MML Aggressive Allocation Fund
MML American Funds Core Allocation Fund
MML American Funds® Growth Fund
MML American Funds® International Fund
MML Balanced Allocation Fund
MML Blue Chip Growth Fund
MML Conservative Allocation Fund
MML Equity Income Fund
MML Equity Index Fund
MML Focused Equity Fund
MML Foreign Fund
MML Fundamental Growth Fund

MML Fundamental Value Fund

MML Global Fund
MML Growth & Income Fund
MML Growth Allocation Fund
MML Income & Growth Fund
MML International Equity Fund
MML Large Cap Growth Fund
MML Managed Volatility Fund
MML Mid Cap Growth Fund
MML Mid Cap Value Fund
MML Moderate Allocation Fund
MML Small Cap Growth Equity Fund
MML Small Company Value Fund
MML Small/Mid Cap Value Fund
MML Total Return Bond Fund

MML Series Investment Fund II

MML Blend Fund
MML Equity Fund
MML High Yield Fund
MML Inflation-Protected and Income Fund
MML Managed Bond Fund
MML Short-Duration Bond Fund

MML Small Cap Equity Fund

MML Strategic Emerging Markets Fund
MML U.S. Government Money Market Fund

Oppenheimer Variable Account Funds

Oppenheimer Capital Appreciation Fund/VA
Oppenheimer Conservative Balanced Fund/VA
Oppenheimer Discovery Mid Cap Growth Fund/VA
Oppenheimer Global Fund/VA
Oppenheimer Global Strategic Income Fund/VA
Oppenheimer Government Money Fund/VA
Oppenheimer International Growth Fund/VA
Oppenheimer Main Street Fund®/VA

PIMCO Variable Insurance Trust

PIMCO CommodityRealReturn® Strategy Portfolio

Voya Investors Trust

VY® Clarion Global Real Estate Portfolio

To learn more about the certificate, you can obtain a copy of the Statement of Additional Information (SAI), dated May 1, 2019. The prospectus and SAI are parts of the registration statement that we filed with the Securities and Exchange Commission (SEC). The SEC maintains a website (<http://www.sec.gov>) that contains the registration statement, material incorporated by reference, and other information regarding companies that file electronically with the SEC. The table of contents for the SAI is on page 36 of this prospectus.

For a free copy of the SAI, or for general inquiries, call our Service Center at (800) 272-2216 or write to our Service Center using the following address: MassMutual, Document Management Services – Annuities W360, P.O. Box 9067, Springfield, MA 01102-9067. (Overnight Mail Address: MassMutual, Document Management Services – Annuities W360, 1295 State Street, Springfield, MA 01111-0111)

Beginning January 1, 2021, we will no longer send you paper copies of fund shareholder reports (Reports) unless you specifically request paper copies from us. The Reports will be available online. We will notify you by mail each time the Reports are posted. The notice will provide the website link(s) to access the Reports as well as instructions for requesting paper copies. If you wish to continue receiving your Reports in paper free of charge from us, please call (866) 444-2450. Your election to receive the Reports in paper will apply to all funds available with your contract. If you have already elected to receive the Reports electronically, you will not be affected by this change and need not take any action. If you wish to receive the Reports and other SEC disclosure documents from us electronically, follow the instructions provided on the inside front cover of this prospectus.

The certificate:

- is not a bank or credit union deposit or obligation.
- is not FDIC or NCUA insured.
- is not insured by any federal government agency.
- is not guaranteed by any bank or credit union.
- may go down in value.
- provides guarantees that are subject to our financial strength and claims-paying ability.

The SEC has not approved or disapproved the certificate or determined that this prospectus is accurate or complete. Any representation that it has is a criminal offense.

This prospectus is not an offer to sell the certificate in any jurisdiction where it is illegal to offer the certificate nor is it an offer to sell the certificate to anyone to whom it is illegal to offer the certificate.

Please read this prospectus before investing. You should keep it for future reference. It contains important information about the MassMutual Artistry Variable Annuity.

Effective May 1, 2019

Table of Contents

Index of Special Terms	3	Withdrawals	19
Contacting the Company	4	Right to Take Loans	20
Overview	4	Expenses	21
Table of Fees and Expenses	6	Insurance Charges	21
The Company	8	Mortality and Expense Risk Charge	21
Ownership	8	Administrative Charge	21
Contract Owner	8	Annual Certificate Maintenance Charge	21
Participant	8	Contingent Deferred Sales Charge	22
Annuitant	8	Free Withdrawals	22
Beneficiary	8	Premium Taxes	23
Beneficiary IRA	8	Transfer Fee	23
Age	9	Income Taxes	23
How We Determine Age of Annuitant, Participant and		Fund Expenses	23
Beneficiary	9	The Income Phase	23
Additional Purchase Payments	9	Annuity Options	25
Allocation of Purchase Payments	9	Death Benefit	26
Right to Cancel Your Certificate	10	Taxes	28
Investment Choices	10	Other Information	33
The Separate Account	10	Distribution	33
The Funds	10	Assignment	34
Addition, Removal, Closure or Substitution of Funds	13	Unclaimed Property	34
Compensation We Receive from Funds, Advisers and		Voting Rights	34
Sub-Advisers	14	Changes to the Certificate	35
The Fixed Account	14	Suspension of Payments or Transfers	35
Certificate Value	15	Termination of Certificate	35
Business Days and Non-Business Days	15	Anti-Money Laundering	35
Sending Requests in Good Order	15	Our Ability to Make Payments Under the Contract	35
Transfers and Transfer Programs	16	Our Financial Statements	36
General Overview	16	Computer System Failures and Cybersecurity	36
Transfers During the Accumulation Phase	16	Legal Proceedings	36
Limits on Frequent Trading and Market Timing		Table of Contents of the Statement of Additional	
Activity	16	Information	36
Transfers During the Income Phase	17	Appendix A	39
Transfer Programs	18	Condensed Financial Information	39

Index of Special Terms

We have tried to make this prospectus as readable and understandable for you as possible. By the very nature of the certificate, however, certain technical words or terms are unavoidable. We have identified the following as some of these words or terms.

The page that is indicated here is where we believe you will find the best explanation for the word or term.

	Page
Accumulation Phase	4
Accumulation Unit	15
Annuitant	8
Annuity Date	23
Annuity Options	25
Annuity Payments	24
Annuity Unit Value	24
Certificate	4
Certificate Year	16
Claims-Paying Ability	35
Contract Owner	8
Free Withdrawals	22
Good Order	15
Income Phase	23
Participant	8
Purchase Payment	9
Qualified	29
Separate Account	10
Service Center	4
Sub-Account	10
Tax Deferral	5
Tax-Sheltered Annuity	27

Contacting the Company

You may contact us by calling the MassMutual Customer Service Center (our Service Center) at (800) 272-2216 Monday through Friday between 8 a.m. and 8 p.m. Eastern Time. You may also contact us by visiting www.MassMutual.com/contact-us. Additionally, you may write to our Service Center using the following address: MassMutual, Document Management Services – Annuities W360, P.O. Box 9067, Springfield, MA 01102-9067 or to our overnight mail address at MassMutual, Document Management Services – Annuities W360, 1295 State Street, Springfield, MA 01111-0111.

Overview

The following is intended as a summary. Please read each section of this prospectus for additional detail.

We no longer sell the MassMutual Artistry certificate. However, we continue to administer existing certificates, and we continue to accept purchase payments to existing certificates, subject to certain restrictions. See “Additional Purchase Payments.”

The annuity certificate is an ownership interest issued by “us,” Massachusetts Mutual Life Insurance Company (“MassMutual” or the “Company”), to “you,” the participant, under the group deferred variable annuity contract. This annuity certificate is a contract between the participant and MassMutual. The certificate is intended for retirement savings or other long-term investment purposes. The certificate is designed primarily for use in annuity purchase plans adopted by public school systems and certain tax-exempt organizations pursuant to Section 403(b) of the Internal Revenue Code of 1986, as amended (IRC). These plans are sometimes called “tax-sheltered annuities” or “TSAs.” The certificate was also sold to governmental entities pursuant to IRC Section 457(b).

In exchange for your purchase payments, we agree to pay you an income when you choose to receive it. You designate the date on which the income period begins. That date must be at least 13 months from when you purchase the certificate. The certificate has two phases – the accumulation phase and the income phase. Your certificate is in the accumulation phase until you decide to begin receiving annuity payments. During the accumulation phase we provide a death benefit. Once you begin receiving annuity payments, your certificate enters the income phase.

Certificate Type	The certificate described in this prospectus is an individual certificate issued under a deferred group variable annuity contract. The certificate provides for accumulation of certificate value and annuity payments on a fixed and/or variable basis. We use the terms “certificate” and “contract” interchangeably to refer to the individual certificate, and we use the terms “participant” and “contract owner” interchangeably to refer to the participant. The certificate is called a variable deferred annuity because you can choose to allocate your purchase payments among various sub-accounts. Certificate value allocated to a sub-account is not guaranteed. It is possible to lose your certificate value allocated to any of the sub-accounts. If you allocate certificate value to the sub-accounts, the amount you are able to accumulate in your certificate depends upon the performance of the sub-accounts you select.
The Prospectus and the Certificate	The prospectus and SAI describe all material terms and features of your certificate. Certain non-material provisions of your certificate may be different than the general description in the prospectus and the SAI, and certain riders may not be available because of legal requirements in your state. See your certificate for specific variations since any such state variation will be included in your certificate or in riders or endorsements attached to your certificate.
Annuity Options	We make annuity payments based on the annuity option you elect. When you elect an annuity option you make a number of choices, including, but not limited to: duration, number of payees, payments to beneficiaries, and whether payments will be variable and/or fixed payments. See “The Income Phase.”
Investment Choices	You can choose to allocate your purchase payments among various investment choices. Your investment choices include a number of sub-accounts and one fixed account. See “Investment Choices.”
Withdrawals	Subject to certain restrictions, you may periodically make partial withdrawals of your certificate value. If you make a full withdrawal of your certificate value, all your rights under the certificate will be terminated. Income taxes, tax penalties and a contingent deferred sales charge may apply to any withdrawal you request. See “Withdrawals,” “Expenses – Contingent Deferred Sales Charge” and “Taxes.”
Transfers	Subject to certain restrictions, you may periodically transfer certificate value among available investment choices. See “Transfers and Transfer Programs.”
Death Benefit	A beneficiary may receive a benefit in the event of your death prior to the income phase. Once the income phase commences, payments upon death may be available to beneficiaries depending on the annuity option elected. See “Death Benefit” and “The Income Phase.”

Fees	Your certificate value will be subject to certain fees. These charges will be reflected in your certificate value and may be reflected in any annuity payments you choose to receive from the certificate. See “Expenses” and “Table of Fees and Expenses.”
Taxation	The Internal Revenue Code of 1986, as amended (IRC), has certain rules that apply to the certificate. These tax treatments apply to earnings from the certificate, withdrawals, death benefits and annuity options. See “Taxes.”
Tax Deferral	You are generally not taxed on certificate earnings until you take money from your certificate. This is known as tax deferral. Tax deferral is automatically provided by tax-qualified retirement plans. There is no additional tax deferral provided when a variable annuity contract is used to fund a tax-qualified retirement plan. Investors should only consider buying a variable annuity to fund a qualified plan for the annuity’s additional features such as lifetime income payments and death benefit protection.
Right to Cancel Your Certificate	You have a right to examine your certificate. If you change your mind about owning your certificate, you can generally cancel it within ten calendar days after receiving it. However, this time period may vary by state. See “Right to Cancel Your Certificate.”
Our Claims-Paying Ability	Any guarantees we make under the contract are subject to our financial strength and claims-paying ability. See “Other Information – Our Ability to Make Payments Under the Contract.”

Table of Fees and Expenses

The following tables describe the fees and expenses you pay when buying, owning, and surrendering the certificate. In addition to other fees and expenses shown below, premium taxes may also apply, but are not reflected below.

I. The first table describes the fees and expenses that you will pay at the time that you transfer the value between investment choices, or surrender the certificate. We do not deduct a sales charge when we receive a purchase payment, but we may assess a contingent deferred sales charge as noted below.

Participant Transaction Expenses	Current	Maximum								
<i>Transfer Fee</i>	\$0	The lesser of \$20 or 2% of the amount transferred.								
<i>Loan Origination Fee</i>	\$0 ¹	\$35 ¹								
<i>Contingent Deferred Sales Charge</i> (as a percentage of amount withdrawn or applied to certain annuity options ²)	8%	8%								
Contingent Deferred Sales Charge Schedule										
Certificate Year	1	2	3	4	5	6	7	8	9	10 and later
Percentage	8%	8%	7%	6%	5%	4%	3%	2%	1%	0%

¹ Currently, we do not deduct a charge from your certificate if you take a loan under your certificate. However, we reserve the right to deduct a charge not to exceed \$35 from your certificate value as a loan origination fee should it become necessary for us to seek reimbursement for expenses related to the administration of certificate loans.

² See Annuity Options E and F in “The Income Phase – Annuity Options.”

II. The next table describes fees and expenses you will pay periodically during the time you own the certificate, not including underlying fund fees and expenses.

Periodic Certificate Charges	Current	Maximum
<i>Annual Certificate Maintenance Charge</i>	\$ 0	\$ 60
<i>Separate Account Annual Expenses</i> (as a percentage of average account value in the separate account on an annualized basis)		
Mortality and Expense Risk Charge	1.03%	1.25%
Administrative Charge	0.15%	0.25%
Total Separate Account Annual Expenses	1.18%	1.50%

Annual Fund Operating Expenses

While you own the certificate, if your assets are invested in any of the sub-accounts, you will be subject to the fees and expenses charged by the fund in which that sub-account invests. The table below shows the minimum and maximum total operating expenses charged by any of the funds, expressed as a percentage of average net assets, for the year ended December 31, 2018 (before any waivers or reimbursements). ¹ More detail concerning each fund’s fees and expenses that you may periodically be charged during the time that you own the certificate is contained in each fund prospectus. Current and future expenses may be higher or lower than those shown.

Charge	Minimum	Maximum
Total Annual Fund Operating Expenses that are deducted from fund assets, including management fees, distribution, and/or 12b-1 fees, and other expenses.	0.42%	2.17%

¹ The fund expenses used to prepare this table were provided to us by the funds. We have not independently verified such information provided to us by funds that are not affiliated with us.

The information above describes the fees and expenses you pay related to the certificate. For information on compensation we may receive from the funds and their advisers and sub-advisers, see “Investment Choices – Compensation We Receive from Funds, Advisers and Sub-Advisers.” For information on compensation we pay to broker-dealers selling the certificate, see “Other Information – Distribution.”

Examples Using Current and Maximum Expenses

These Examples are intended to help you compare the cost of investing in the certificate with the cost of investing in other variable annuity contracts. These costs include participant transaction expenses, certificate fees, separate account annual expenses, and fund fees and expenses. The Examples assume that no loan has been taken.

Example I assumes that you withdraw all your certificate value at the end of each year shown.

Example II assumes you do not withdraw any certificate value at the end of each year shown, or that you decide to begin the income phase at the end of each year shown and we do not deduct a contingent deferred sales charge. (Currently the income phase is not available until 13 months after you purchase your certificate.)

Both Example I and Example II assume:

- that you invest \$10,000 in the certificate for the time periods indicated,
- that you allocate it to a sub-account that has a 5% gross return each year,
- that either the current or maximum fees and expenses in the “Table of Fees and Expenses” apply, and
- that you selected one of two sub-accounts:
 - 1) the one that invests in the fund with the maximum total operating expenses; or
 - 2) the one that invests in the fund with the minimum total operating expenses.

Examples Using Current Expenses. Based on the above assumptions, your costs would be as shown in the following table. Your actual costs may be higher or lower.

Years	Example I				Example II			
	1	3	5	10	1	3	5	10
Sub-Account with maximum total operating expenses	\$1,068	\$1,685	\$2,220	\$3,610	\$335	\$1,022	\$1,731	\$3,610
Sub-Account with minimum total operating expenses	\$ 907	\$1,196	\$1,390	\$1,868	\$160	\$ 497	\$ 856	\$1,868

Examples Using Maximum Expenses. Based on the above assumptions, your costs would be as shown in the following table. Your actual costs may be higher or lower.

Years	Example I				Example II			
	1	3	5	10	1	3	5	10
Sub-Account with maximum total operating expenses	\$1,113	\$1,817	\$2,440	\$4,043	\$384	\$1,164	\$1,963	\$4,043
Sub-Account with minimum total operating expenses	\$ 952	\$1,333	\$1,627	\$2,382	\$209	\$ 644	\$1,105	\$2,382

The examples using current expenses do not reflect an annual certificate maintenance charge. The examples using maximum expenses reflect the annual certificate maintenance charge of \$60 as an annual charge of 0.17%.

The examples do not reflect any premium taxes. However, premium taxes may apply.

The examples should not be considered a representation of past or future expenses. Your actual expenses may be higher or lower than those shown in the examples. The assumed 5% annual rate of return is hypothetical. Actual returns may be greater or less than the assumed hypothetical return.

There is an accumulation unit value history in “Appendix A – Condensed Financial Information.”

There is information concerning compensation payments we make to sales representatives in connection with the sale of the certificates in “Other Information – Distribution.”

The Company

In this prospectus, the “Company,” “we,” “us,” and “our” refer to Massachusetts Mutual Life Insurance Company (MassMutual). MassMutual and its domestic life insurance subsidiaries provide individual and group life insurance, disability insurance, individual and group annuities and guaranteed interest contracts to individual and institutional customers in all 50 states of the U.S., the District of Columbia and Puerto Rico. Products and services are offered primarily through the Company’s distribution channels: MassMutual Financial Advisors, Direct to Consumer, Institutional Solutions and Workplace Solutions.

MassMutual is organized as a mutual life insurance company. MassMutual’s home office is located at 1295 State Street, Springfield, Massachusetts 01111-0001.

Ownership

Contract Owner

The contract owner is the person or non-natural person who maintains the ownership rights stated in the contract that are not delegated to the participants. The owner of the contract is usually an employer, trustee or other sponsor of a group that is comprised of participants. If the contract is purchased as part of an employee benefit plan, the plan may govern which ownership rights are maintained by the contract owner and which are delegated to participants.

Participant

In this prospectus, “you” and “your” refer to the participant. The participant is named at time of application. The participant must be an individual, unless the contract is issued under IRC Section 457(b), in which case the owner must be a non-natural entity. We will not issue a certificate to you if you have passed age 85 as of the date we proposed to issue the certificate. The maximum issue age for the certificate and certain of its riders may be reduced in connection with the offer of the certificate through certain broker-dealers. You should discuss this with your registered representative.

As the participant, you exercise all rights under the certificate. The participant names the beneficiary.

If you purchased the certificate as a tax-qualified certificate, your rights in the certificate may be subject to restrictions under the plan documents.

Certificates under qualified plans, including section 457 deferred compensation plans, generally must be held by the plan sponsor or plan trustee. Except for TSAs and IRAs, an individual cannot be the participant under a certificate held to fund a qualified plan. Therefore, the individuals covered by the qualified plan have no ownership rights.

Annuitant

The annuitant is the person on whose life we base annuity payments. You designate the annuitant at the time of application. We will not issue a certificate to you if the proposed annuitant has passed age 85 as of the date we proposed to issue the certificate. In order for the certificate to qualify as a tax-sheltered annuity or an individual retirement annuity, you must be named as participant and annuitant. We will use the age of the annuitant to determine all applicable benefits under a certificate owned by a non-natural person.

Beneficiary

The beneficiary is the person(s) or entity you name to receive any death benefit. You name the beneficiary at the time of application. You may change the beneficiary at any time before you die. To change an irrevocable beneficiary, we must receive written authorization on our form in good order at our Service Center from the irrevocable beneficiary.

If you are married and your certificate is issued under an ERISA plan, your ability to name a primary beneficiary other than your spouse is restricted.

Beneficiary IRA

Beneficiary, Inherited, Legacy or “Stretch” IRAs are all terms used to describe an IRA that is used exclusively to distribute death proceeds of an IRA or other qualified investment to the beneficiary over that beneficiary’s life expectancy in order to meet the required minimum distribution (RMD) rules. Upon the contract owner’s death under an IRA or other qualified contract, a beneficiary(ies) may generally establish a Beneficiary IRA by either purchasing a new annuity contract or in some circumstances, by electing the Beneficiary IRA payout option under the current contract. Until withdrawn, amounts in a Beneficiary IRA or other qualified contract continue to be tax deferred. Amounts withdrawn each year, including amounts that are required to be withdrawn under the RMD rules, are subject to tax. For a list of the eligibility requirements/restrictions, see “Death Benefit – Beneficiary IRA Election.”

Age

How We Determine Age of Annuitant, Participant and Beneficiary

In this prospectus the term “age,” except when discussed in regards to specific tax provisions, is defined as “insurance age,” which is a person’s age on his/her birthday nearest the date for which the age is being determined. This means we calculate your age based on your nearest birthday, which could be either your last birthday or your next. For example, age 80 is generally the period of time between age 79 years, 6 months and 1 day and age 80 and 6 months.

Additional Purchase Payments

We no longer sell the MassMutual Artistry variable annuity certificate. However, we do continue to administer existing certificates, and you may continue making additional purchase payments to your certificate, subject to the limits described in this section.

The minimum amount we accepted for an initial purchase payment was:

- \$200 by the first certificate anniversary date, for a certificate purchased with salary reduction payments; or
- \$2,000 for a certificate purchased through a direct asset transfer from another financial institution or one of our affiliates or through non-salary reduction payments.

Additional purchase payments may be made to the certificate. However, additional purchase payments of less than \$25 are subject to our approval.

For certificates issued on or after May 1, 2010, the maximum amount of cumulative purchase payments we accept without our prior approval is \$1.5 million.

For certificates issued prior to May 1, 2010, the maximum amount of cumulative purchase payments we accept without our prior approval is based on your age when we issued the certificate. The maximum amount is:

- \$1.5 million up to age 75; or
- \$500,000 if older than age 75 or if the participant is a non-natural person.

Age is as of the nearest birthday. For example, age 80 is generally the period of time between age 79 years, 6 months and 1 day and age 80 and 6 months. See “Age.”

You can make additional purchase payments:

- by mailing a check that clearly indicates your name and certificate number to our lockbox:

First Class Mail

MassMutual Artistry NY
Annuity Payment Services
MassMutual P.O. Box 74908
Chicago, IL 60675-4908

Overnight Mail

MassMutual Artistry NY
Annuity Payment Services
350 North Orleans Street
Receipt & Dispatch, 8th Floor
Suite 4908
Chicago, IL 60654

- by Wire Transfer

JP Morgan Chase Bank
New York, New York
ABA #021000021
MassMutual Account #323956297
Ref: Annuity Certificate #
Name: (Your Name)

You may also send purchase payments to our Service Center. We have the right to reject any application or purchase payment.

Allocation of Purchase Payments

When you purchased your certificate, we applied your purchase payment among the investment choices according to the allocation instructions you provided. If you make additional purchase payments and do not provide new allocation instructions, we will apply each according to the allocation instructions we have on record. Unless we are instructed otherwise, we will apply purchase payments made by your employer in accordance with your purchase payment allocation instructions in effect at the time we receive your employer’s purchase payment.

Currently, there is no limit to the number of investment choices that you may invest in at any one time. However, we reserve the right to limit the number of investment choices that you may invest in to a maximum of 18 investment choices (including the fixed account) at any one time in the event administrative burdens require such a limitation.

Once we receive your initial purchase payment and the necessary information in good order at our Service Center or lockbox, we will issue your certificate and apply your initial purchase payment within two business days. If you do not give us all of

the information we need, we will notify you. When we receive all of the necessary information, we will then apply your initial purchase payment within two business days. If for some reason we are unable to complete this process within five business days, we will either send back your money or get your permission to keep it until we receive all of the necessary information. If additional purchase payments are made to your certificate, we will credit these amounts to your certificate on the business day we receive them and all necessary information in good order at our Service Center or lockbox. If we receive your purchase payment at our Service Center or lockbox on a non-business day or after the business day closes, we will credit the amount to your certificate effective the next business day. Our business day closes when the New York Stock Exchange (NYSE) closes, usually 4:00 p.m. Eastern Time.

Right to Cancel Your Certificate

You have a right to examine your certificate. If you change your mind about owning your certificate, you can cancel it within ten calendar days after receiving it. When you cancel the certificate within this time period, we will not assess a contingent deferred sales charge. You will receive your certificate value as of the business day we receive your certificate and your written request in good order at our Service Center, and your certificate will be terminated.

Investment Choices

Choose Investment Choices Appropriate for You. When electing among your available investment choices consider your circumstances, investment goals, financial situation and risk tolerance. After you elect investment choices for your initial purchase payment, you should monitor and periodically re-evaluate your allocations to determine if they are still appropriate. Through the certificate we offer a number of investment choices, but we do not recommend or endorse any particular investment choice and we do not provide investment advice. Because investment risk is borne by you, carefully consider your investment choice elections.

Understand the Risks Associated with Your Investment Choices. If your certificate value is allocated to a fund, your certificate value will be influenced by the investment performance of that fund. You will want to read the fund prospectus, especially the section discussing the risks of investing in the fund. We will deliver current fund prospectuses and/or current summary fund prospectuses to you. You may also contact our Service Center to request current fund prospectuses and summary fund prospectuses. Summary fund prospectuses for certain funds may be unavailable.

Be Informed. Read this prospectus. Also review information about the funds: the fund prospectus, statement of additional information, annual report and semiannual report.

The Separate Account

We established Massachusetts Mutual Variable Annuity Separate Account 4 (separate account) as a separate account under Massachusetts law on July 9, 1997. The separate account is registered with the SEC as a unit investment trust under the Investment Company Act of 1940 (1940 Act).

The separate account holds the assets that underlie the certificates, except those assets allocated to our general account. We keep the separate account assets separate from the assets of our general account and other separate accounts. The separate account is divided into sub-accounts, each of which invests exclusively in a single investment choice.

We own the assets of the separate account. We credit gains to, or charge losses against, the separate account, whether or not realized, without regard to the performance of other investment accounts. The separate account's assets may not be used to pay any of our liabilities other than those arising from the certificates. If the separate account's assets exceed the required reserves and other liabilities, we may transfer the excess to our general account. The obligations of the separate account are not our generalized obligations and will be satisfied solely by the assets of the separate account.

The Funds

The following funds are available as investment choices under the certificate. If your certificate value is allocated to a fund, your certificate value will be influenced by the investment performance of that fund.

These funds are only available to insurance company separate accounts and qualified retirement plans, are not available for purchase directly by the general public, and are not the same as other mutual fund portfolios with very similar or nearly identical names and investment goals and policies that are sold directly to the public. While a fund may have many similarities to these other publicly available mutual funds, you should not expect the investment results of the fund to be the same as the investment

results of those publicly available mutual funds. We do not guarantee or make any representation that the investment results of the funds will be comparable to the investment results of any other mutual fund, even a mutual fund with the same investment adviser or manager.

Fund Type	Investment Funds in Which the Sub-Accounts Purchase Shares	Investment Fund's Adviser and Sub-Adviser
<i>Asset Allocation</i>		
	MML Aggressive Allocation Fund (Initial Class) ¹	<i>Adviser:</i> MML Investment Advisers, LLC <i>Sub-Adviser:</i> N/A
	MML American Funds Core Allocation Fund (Service Class I) ¹	<i>Adviser:</i> MML Investment Advisers, LLC <i>Sub-Adviser:</i> N/A
	MML Balanced Allocation Fund (Initial Class) ¹	<i>Adviser:</i> MML Investment Advisers, LLC <i>Sub-Adviser:</i> N/A
	MML Conservative Allocation Fund (Initial Class) ¹	<i>Adviser:</i> MML Investment Advisers, LLC <i>Sub-Adviser:</i> N/A
	MML Growth Allocation Fund (Initial Class) ¹	<i>Adviser:</i> MML Investment Advisers, LLC <i>Sub-Adviser:</i> N/A
	MML Moderate Allocation Fund (Initial Class) ¹	<i>Adviser:</i> MML Investment Advisers, LLC <i>Sub-Adviser:</i> N/A
<i>Money Market</i>		
	MML U.S. Government Money Market Fund (Initial Class) ²	<i>Adviser:</i> MML Investment Advisers, LLC <i>Sub-Adviser:</i> Barings LLC
	Oppenheimer Government Money Fund/VA (Non-Service) ^{2, 3}	<i>Adviser:</i> OFI Global Asset Management, Inc. <i>Sub-Adviser:</i> OppenheimerFunds, Inc.
<i>Fixed Income</i>		
	MML High Yield Fund (Service Class I)	<i>Adviser:</i> MML Investment Advisers, LLC <i>Sub-Adviser:</i> Barings LLC
	MML Inflation-Protected and Income Fund (Initial Class)	<i>Adviser:</i> MML Investment Advisers, LLC <i>Sub-Adviser:</i> Barings LLC
	MML Managed Bond Fund (Initial Class)	<i>Adviser:</i> MML Investment Advisers, LLC <i>Sub-Adviser:</i> Barings LLC
	MML Short-Duration Bond Fund (Service Class I)	<i>Adviser:</i> MML Investment Advisers, LLC <i>Sub-Adviser:</i> Barings LLC
	MML Total Return Bond Fund (Service Class I)	<i>Adviser:</i> MML Investment Advisers, LLC <i>Sub-Adviser:</i> Metropolitan West Asset Management, LLC
	Oppenheimer Global Strategic Income Fund/VA (Non-Service)	<i>Adviser:</i> OFI Global Asset Management, Inc. <i>Sub-Adviser:</i> OppenheimerFunds, Inc.
<i>Balanced</i>		
	MML Blend Fund (Initial Class)	<i>Adviser:</i> MML Investment Advisers, LLC <i>Sub-Adviser:</i> Barings LLC
	Oppenheimer Conservative Balanced Fund/VA (Non-Service) ⁴	<i>Adviser:</i> OFI Global Asset Management, Inc. <i>Sub-Adviser:</i> OppenheimerFunds, Inc.
<i>Large Cap Value</i>		
	MML Equity Fund (Initial Class)	<i>Adviser:</i> MML Investment Advisers, LLC <i>Sub-Advisers:</i> OppenheimerFunds, Inc. and Brandywine Global Investment Management, LLC
	MML Equity Income Fund (Initial Class)	<i>Adviser:</i> MML Investment Advisers, LLC <i>Sub-Adviser:</i> T. Rowe Price Associates, Inc.
	MML Fundamental Value Fund (Service Class I)	<i>Adviser:</i> MML Investment Advisers, LLC <i>Sub-Adviser:</i> Boston Partners Global Investors, Inc.
	MML Income & Growth Fund (Initial Class)	<i>Adviser:</i> MML Investment Advisers, LLC <i>Sub-Adviser:</i> Barrow, Hanley, Mewhinney & Strauss, LLC

Fund Type	Investment Funds in Which the Sub-Accounts Purchase Shares	Investment Fund's Adviser and Sub-Adviser
<i>Large Cap Blend</i>		
	Fidelity® VIP Contrafund® Portfolio (Initial Class)	Adviser: Fidelity Management & Research Company Sub-Adviser: FMR Co., Inc.
	Invesco V.I. Diversified Dividend Fund (Series I)	Adviser: Invesco Advisers, Inc. Sub-Adviser: N/A
	MML Equity Index Fund (Class I)	Adviser: MML Investment Advisers, LLC Sub-Adviser: Northern Trust Investments, Inc.
	MML Focused Equity Fund (Service Class I)	Adviser: MML Investment Advisers, LLC Sub-Adviser: Wellington Management Company LLP
	MML Growth & Income Fund (Initial Class)	Adviser: MML Investment Advisers, LLC Sub-Adviser: Massachusetts Financial Services Company
	Oppenheimer Main Street Fund®/VA (Non-Service)	Adviser: OFI Global Asset Management, Inc. Sub-Adviser: OppenheimerFunds, Inc.
<i>Large Cap Growth</i>		
	MML American Funds® Growth Fund (Service Class I) ⁵	Adviser: MML Investment Advisers, LLC Sub-Adviser: N/A
	MML Blue Chip Growth Fund (Initial Class)	Adviser: MML Investment Advisers, LLC Sub-Adviser: T. Rowe Price Associates, Inc.
	MML Fundamental Growth Fund (Service Class I)	Adviser: MML Investment Advisers, LLC Sub-Adviser: Wellington Management Company LLP
	MML Large Cap Growth Fund (Initial Class)	Adviser: MML Investment Advisers, LLC Sub-Adviser: Loomis, Sayles & Company, L.P.
	Oppenheimer Capital Appreciation Fund/VA (Non-Service)	Adviser: OFI Global Asset Management, Inc. Sub-Adviser: OppenheimerFunds, Inc.
<i>Small/Mid Cap Value</i>		
	MML Mid Cap Value Fund (Initial Class)	Adviser: MML Investment Advisers, LLC Sub-Adviser: American Century Investment Management, Inc.
	MML Small Company Value Fund (Service Class I)	Adviser: MML Investment Advisers, LLC Sub-Adviser: T. Rowe Price Associates, Inc.
	MML Small/Mid Cap Value Fund (Initial Class)	Adviser: MML Investment Advisers, LLC Sub-Adviser: AllianceBernstein L.P.
<i>Small/Mid Cap Blend</i>		
	MML Small Cap Equity Fund (Initial Class)	Adviser: MML Investment Advisers, LLC Sub-Adviser: OppenheimerFunds, Inc.
<i>Small/Mid Cap Growth</i>		
	MML Mid Cap Growth Fund (Initial Class)	Adviser: MML Investment Advisers, LLC Sub-Adviser: T. Rowe Price Associates, Inc.
	MML Small Cap Growth Equity Fund (Initial Class)	Adviser: MML Investment Advisers, LLC Sub-Adviser: Wellington Management Company LLP
	Oppenheimer Discovery Mid Cap Growth Fund/VA (Non-Service)	Adviser: OFI Global Asset Management, Inc. Sub-Adviser: OppenheimerFunds, Inc.
<i>International/Global</i>		
	MML American Funds® International Fund (Service Class I) ⁵	Adviser: MML Investment Advisers, LLC Sub-Adviser: N/A
	MML Foreign Fund (Initial Class)	Adviser: MML Investment Advisers, LLC Sub-Adviser: Templeton Investment Counsel, LLC
	MML Global Fund (Class II)	Adviser: MML Investment Advisers, LLC Sub-Adviser: Massachusetts Financial Services Company

Fund Type	Investment Funds in Which the Sub-Accounts Purchase Shares	Investment Fund's Adviser and Sub-Adviser
<i>International/Global (continued)</i>		
	MML International Equity Fund (Service Class I)	<i>Adviser:</i> MML Investment Advisers, LLC <i>Sub-Adviser:</i> Harris Associates L.P.
	MML Strategic Emerging Markets Fund (Service Class I)	<i>Adviser:</i> MML Investment Advisers, LLC <i>Sub-Adviser:</i> OppenheimerFunds, Inc.
	Oppenheimer Global Fund/VA (Non-Service)	<i>Adviser:</i> OFI Global Asset Management, Inc. <i>Sub-Adviser:</i> OppenheimerFunds, Inc.
	Oppenheimer International Growth Fund/VA (Non-Service)	<i>Adviser:</i> OFI Global Asset Management, Inc. <i>Sub-Adviser:</i> OppenheimerFunds, Inc.
<i>Specialty</i>		
	Invesco V.I. Health Care Fund (Series I)	<i>Adviser:</i> Invesco Advisers, Inc. <i>Sub-Adviser:</i> N/A
	Invesco V.I. Technology Fund (Series I)	<i>Adviser:</i> Invesco Advisers, Inc. <i>Sub-Adviser:</i> N/A
	MML Managed Volatility Fund (Initial Class)	<i>Adviser:</i> MML Investment Advisers, LLC <i>Sub-Adviser:</i> Gateway Investment Advisers, LLC
	PIMCO CommodityRealReturn [®] Strategy Portfolio (Advisor Class)	<i>Adviser:</i> Pacific Investment Management Company LLC <i>Sub-Adviser:</i> N/A
	VY [®] Clarion Global Real Estate Portfolio (Class S)	<i>Adviser:</i> Voya Investments, LLC <i>Sub-Adviser:</i> CBRE Clarion Securities LLC

- 1 *These are fund-of-funds investment choices. They are known as fund-of-funds because they invest in other underlying funds. A fund offered in a fund-of-funds structure may have higher expenses than a direct investment in its underlying funds because a fund-of-funds bears its own expenses and indirectly bears its proportionate share of expenses of the underlying funds in which it invests.*
- 2 *You could lose money by investing in the fund. Although the fund seeks to preserve the value of your investment at \$1.00 per share, it cannot guarantee it will do so. An investment in the fund is not insured or guaranteed by the Federal Deposit Insurance Corporation or any other government agency. The fund's sponsor has no legal obligation to provide financial support to the fund, and you should not expect that the sponsor will provide financial support to the fund at any time. The yield of this fund may become very low during periods of low interest rates. After deduction of separate account charges, the yield in the sub-account that invests in this fund could be negative.*
- 3 *Unavailable in certificates issued on or after January 19, 2008.*
- 4 *Unavailable in certificates issued on or after April 30, 2012.*
- 5 *The fund is a "feeder" fund, meaning that it does not buy investment securities directly, but instead invests in shares of a corresponding "master" fund, which in turn purchases investment securities. A fund offered in a master-feeder structure may have higher expenses than those of a fund which invests directly in securities because the "feeder" fund bears its own expenses in addition to those of the "master" fund. You should read the fund prospectuses for more information about this "feeder" fund.*

There is no assurance that the funds will achieve their stated objective. The fund prospectuses contain more detailed information about the funds. We will deliver current fund prospectuses and/or current summary fund prospectuses to you. You may also contact our Service Center to request current fund prospectuses and summary fund prospectuses. Summary fund prospectuses for certain funds may be unavailable. You should read the information contained in the fund prospectuses carefully before investing.

Addition, Removal, Closure or Substitution of Funds

We have the right to change the funds offered through the certificate, but only as permitted by law. If the law requires, we will also get your approval and the approval of any appropriate regulatory authorities. Changes may only impact certain certificate owners. Examples of possible changes include: adding new funds or fund classes; removing existing funds or fund classes; closing existing funds or fund classes; or substituting a fund with a different fund. New or substitute funds may have different fees and expenses. We will not add, remove, close or substitute any shares attributable to your interest in a sub-account without notice to you and prior approval of the SEC, to the extent required by applicable law. We reserve the right to transfer separate account assets to another separate account that we determine to be associated with the class of certificates to which your certificate belongs.

Conflicts of Interest. The funds available with the certificate may also be available to registered separate accounts offering variable annuity and variable life products of other affiliated and unaffiliated insurance companies, as well as to the separate account and other separate accounts of MassMutual. Although we do not anticipate any disadvantages to this, it is possible that a material conflict may arise between the interests of the separate account and one or more of the other separate accounts participating in the funds. A conflict may occur, for example, as a result of a change in law affecting the operations of variable life and variable annuity separate accounts, differences in the voting instructions of the owners and payees and those of other

insurance companies, or some other reason. In the event of a conflict of interest, we will take steps necessary to protect owners and payees, including withdrawing the separate account from participation in the funds involved in the conflict or substituting shares of other funds.

Compensation We Receive from Funds, Advisers and Sub-Advisers

Compensation We Receive from Advisers and Sub-Advisers. We and certain of our insurance affiliates receive compensation from the advisers and sub-advisers to some of the funds. We may use this compensation to pay expenses that we incur in promoting, issuing, distributing and administering the certificate and, providing services, on behalf of the funds, in our role as intermediary to the funds. The amount of this compensation is determined by multiplying a specified annual percentage rate by the average net assets held in that fund that are attributable to the variable annuity and variable life insurance products issued by us and our affiliates that offer the particular fund (MassMutual's variable contracts). These percentage rates differ, but currently do not exceed 0.25%. Some advisers and sub-advisers pay us more than others; some do not pay us any such compensation.

The compensation may not be reflected in a fund's expenses because this compensation may not be paid directly out of a fund's assets. These payments also may be derived, in whole or in part, from the advisory fee deducted from fund assets. Participants, through their indirect investment in the funds, bear the costs of these advisory fees (see the funds' prospectuses for more information).

In addition, we may receive fixed dollar payments from the advisers and sub-advisers to certain funds so that the adviser and sub-adviser can participate in sales meetings conducted by MassMutual. Attending such meetings provides advisers and sub-advisers with opportunities to discuss and promote their funds. **For a list of the funds whose advisers and sub-advisers currently pay such compensation, visit www.MassMutual.com/legal/compensation-arrangements or call our Service Center at the number shown on page 1 of this prospectus.**

Compensation We Receive from Funds. We and certain of our affiliates also receive compensation from certain funds pursuant to Rule 12b-1 under the 1940 Act. This compensation is paid out of the fund's assets and may be as much as 0.25% of the average net assets of an underlying fund which are attributable to MassMutual's variable contracts. An investment in a fund with a 12b-1 fee will increase the cost of your investment in the certificate.

Compensation and Fund Selection. When selecting the funds that will be available with MassMutual's variable contracts we consider each fund's investment strategy, asset class, manager's reputation, and performance. We also consider the amount of compensation that we receive from the funds, their advisers, sub-advisers, or their distributors. The compensation that we receive may be significant and we may profit from this compensation. Additionally, we offer certain funds through the contract at least in part because they are managed by us or an affiliate.

The Fixed Account

We offer one fixed account, as an investment option.

Purchase payments allocated to the fixed account and transfers to the fixed account become part of our general account which supports insurance and annuity obligations. The general account has not been registered under the Securities Act of 1933 (1933 Act) nor is the general account registered under the 1940 Act because of exemptive and exclusionary provisions. Accordingly, neither the general account nor any interests therein are generally subject to the provisions of the 1933 Act or the 1940 Act. Disclosures regarding the fixed account or the general account, however, are subject to certain generally applicable provisions of the federal securities laws relating to the accuracy and completeness of statements made in this prospectus. For more information about our general account see "Other Information – Our Ability to Make Payments Under the Contract."

You may allocate purchase payments to the fixed account. You can also make transfers of your certificate value into the fixed account. You do not participate in the investment performance of the assets in the fixed account. Instead, we credit your certificate with interest at a specified rate that we declare in advance. We will credit an interest rate at a rate not less than the minimum allowed by state law at the time we issue your certificate. We reserve the right to change the guaranteed minimum interest rate for newly issued certificates, subject to applicable state law.

Certificate Value

Your certificate value is the sum of your value in the sub-accounts and the fixed account.

Your value in the separate account will vary depending on the investment performance of the funds you choose. In order to keep track of your certificate value in the separate account, we use a unit of measure called an accumulation unit. During the income phase of your certificate we call the unit an annuity unit if a variable annuity option is elected.

Accumulation Units. Every business day we determine the value of an accumulation unit for each of the sub-accounts. Changes in the accumulation unit value reflect the investment performance of the fund as well as deductions for insurance and other charges.

The value of an accumulation unit may go up or down from business day to business day. The SAI contains more information on the calculation of the accumulation unit value.

When you make a purchase payment, we credit your certificate with accumulation units. We determine the number of accumulation units to credit by dividing the amount of the purchase payment allocated to a sub-account by the value of the accumulation unit for that sub-account. When you make a withdrawal, we deduct from your certificate accumulation units representing the withdrawal amount.

We calculate the value of an accumulation unit for each sub-account after the NYSE closes each business day. Any change in the accumulation unit value will be reflected in your certificate value.

Example:

On Monday we receive an additional purchase payment of \$5,000 from you. You have told us you want this to go to the MML Equity sub-account. When the NYSE closes on that Monday, we determine that the value of an accumulation unit for the MML Equity sub-account is \$13.90. We then divide \$5,000 by \$13.90 and credit your certificate on Monday night with 359.71 accumulation units for the MML Equity sub-account.

Business Days and Non-Business Days

Our business day closes when the NYSE business day closes. The NYSE business day usually closes at 4:00 p.m. Eastern Time. Our non-business days are those days when the NYSE is not open for trading.

Sending Requests in Good Order

From time to time you may want to submit a request for transfer among investment choices, a withdrawal, a change of beneficiary, or some other action. We can only act upon your request if we receive it in “good order.” Contact our Service Center to learn what information we require for your request to be in “good order.” Generally, your request must include the information and/or documentation we need to complete the action without using our own discretion to carry it out. Additionally, some actions may require that you submit your request on our form. We may, in our sole discretion, determine whether any particular transaction request is in good order, and we reserve the right to change or waive any good order requirements at any time. To help protect against unauthorized or fraudulent telephone instructions, we will use reasonable procedures to confirm that telephone instructions given to us are genuine. We may record all telephone instructions.

In addition to written requests, we may allow requests to our Service Center:

- by fax at (866) 329-4272,
- by e-mail at ANNfax@MassMutual.com,
- by telephone at (800) 272-2216, or
- by internet at www.MassMutual.com/loginsc.

Fax, telephone, e-mail or internet transactions may not always be available. Fax, telephone and computer systems can experience outages or slowdowns for a variety of reasons. These outages or slowdowns may prevent or delay our receipt of your request. We may make these additional methods available at our discretion. They may be suspended or discontinued at any time without notice. Not all transaction types can be requested by fax, telephone or the internet.

Transfers and Transfer Programs

General Overview

We have the right to terminate, suspend, or modify the transfer and transfer program provisions described in this prospectus.

You can transfer all or part of your certificate value. You can make transfers by written request, e-mail, telephone, fax, or by other means we authorize. You must clearly indicate the amount and investment choices from and to which you wish to transfer.

Your registered representative may provide us with instructions on your behalf involving fund transfers subject to our rules and requirements, including the restrictions on frequent trading and market timing activities.

Your transfer is effective on the business day we receive your request in good order at our Service Center. Our business day closes when the NYSE closes, usually 4:00 p.m. Eastern Time. If we receive your transfer request in good order at our Service Center on a non-business day or after our business day closes, your transfer request will be effective on the next business day.

Transfers During the Accumulation Phase

You may transfer all or part of your assets in a fund or the fixed account. You can make a transfer to or from the fixed account and to or from any fund.

Currently, you can transfer certificate value during the accumulation phase without charge. However, we reserve the right to deduct a transfer fee of \$20 per transfer or, if less, 2% of the amount transferred for each transfer allowed in a calendar year as provided by the certificate. We also reserve the right to limit the number of transfers that you can make as provided by the certificate.

The following rules apply to any transfer during the accumulation phase:

- 1) Currently, the minimum amount which you can transfer is:
 - \$100; or
 - the entire value in a fund, if less.

We reserve the right to impose a minimum transfer requirement of \$500. Currently, we do not require that a minimum amount remain in the fund after a transfer. However, we reserve the right to require that \$500 remain in the fund after a transfer unless you transfer the entire fund value. We waive these requirements if the transfer is made in connection with the Automatic Rebalancing Program.

- 2) You must clearly indicate the amount and investment choices from and to which you wish to transfer.
- 3) If your certificate value in the fixed account is \$500 or less at the time of your transfer, then you may transfer the entire amount out of the fixed account, less the amount of any outstanding certificate loan.

If your certificate value in the fixed account is more than \$500, then during any certificate year we limit transfers out of the fixed account to 30% of your certificate value in the fixed account as of the end of the previous certificate year. However, if you transfer 30% of your certificate value in the fixed account for three consecutive certificate years, your transfer in the fourth consecutive certificate year may be for the entire amount in the fixed account, provided that you have not applied payments or transferred certificate value into the fixed account from the time the first annual transfer was made. For purposes of this restriction, your certificate value in the fixed account does not include the amount of any outstanding loan. You may not transfer certificate value out of the loaned portion of the fixed account. We measure a certificate year from the anniversary of the day we issued your certificate. Transfers out of the fixed account are done on a first-in, first-out basis. In other words, amounts attributed to the oldest purchase payments are transferred first; then amounts attributed to the next oldest purchase payment are transferred; and so on.

- 4) We consider the fixed account and a money market fund to be “competing accounts.” Transfers between competing accounts are not allowed. For a period of 90 days following a transfer out of a competing account, no transfers may be made into the other competing account. In addition, for a period of 90 days following a transfer into a competing account, no transfers may be made out of the other competing account.

Limits on Frequent Trading and Market Timing Activity

This certificate and its investment choices are not designed to serve as vehicles for what we have determined to be frequent trading or market timing trading activity. We consider these activities to be abusive trading practices that can disrupt the management of a fund in the following ways:

- by requiring the fund to keep more of its assets liquid rather than investing them for long-term growth, resulting in lost investment opportunity; and
- by causing unplanned portfolio turnover.

These disruptions, in turn, can result in increased expenses and can have an adverse effect on fund performance that could impact all participants and beneficiaries under the certificate, including long-term participants who do not engage in these activities.

Therefore, we discourage frequent trading and market timing trading activity and will not accommodate frequent transfers of certificate value among the funds. Organizations and individuals that intend to trade frequently and/or use market timing investment strategies should not purchase this certificate.

We have adopted policies and procedures to help us identify those individuals or entities that we determine may be engaging in frequent trading and/or market timing trading activities. We monitor trading activity to uniformly enforce those procedures. However, those who engage in such activities may employ a variety of techniques to avoid detection. Our ability to detect frequent trading or market timing may be limited by operational or technological systems, as well as by our ability to predict strategies employed by participants (or those acting on their behalf) to avoid detection. Therefore, despite our efforts to prevent frequent trading and the market timing of funds among the sub-accounts, there can be no assurance that we will be able to identify and curtail every instance of trading of those who trade frequently or those who employ a market timing strategy or those who act as intermediaries on behalf of such persons. Moreover, our ability to discourage and restrict frequent trading or market timing may be limited by decisions of state regulatory bodies and court orders that we cannot predict.

In addition, some of the funds are available with variable products issued by other insurance companies. We do not know the effectiveness of the policies and procedures used by these other insurance companies to detect frequent trading and/or market timing. As a result of these factors, the funds may reflect lower performance and higher expenses across all certificates as a result of undetected abusive trading practices.

If we, or the investment adviser to any of the funds available with this certificate, determine that a participant's transfer patterns reflect frequent trading or employment of a market timing strategy, we will allow the participant to submit transfer requests by regular mail only. We will not accept other participant transfer requests if submitted by overnight mail, fax, the telephone, our website, or any other type of electronic medium. Additionally, we may reject any single trade that we determine to be abusive or harmful to the fund. Orders for the purchase of fund shares may be subject to acceptance by the fund. Therefore, we reserve the right to reject, without prior notice, any fund transfer request if the investment in the fund is not accepted for any reason.

The funds may assess a redemption fee (which we reserve the right to collect) on shares held for a relatively short period. The prospectuses for the funds describe the funds' frequent trading and market timing policies and procedures, which may be more or less restrictive than the policies and procedures we have adopted. We have entered into a written agreement, as required by SEC regulation, with each fund or its principal underwriter that obligates us to provide to the fund promptly upon request certain information about the trading activity of individual participants, and to execute instructions from the fund to restrict or prohibit further purchases or transfers by specific participants who violate the frequent trading or market timing policies established by the fund.

Participants and other persons with interests in the certificates should be aware that the purchase and redemption orders received by the funds generally are "omnibus" orders from intermediaries, such as retirement plans or separate accounts funding variable insurance contracts. The omnibus orders reflect the aggregation and netting of multiple orders from individual owners of variable contracts and/or individual retirement plan participants. The omnibus nature of these orders may limit the funds in their ability to apply their frequent trading or market timing policies and procedures. It may also require that we restrict or prohibit further purchases or transfers as requested by a fund on all certificates owned by a participant whose trading activity under one variable certificate has violated a fund's frequent trading or market timing policy. If a fund believes that an omnibus order reflects one or more transfer requests from participants engaged in frequent trading or market timing activity, the fund may reject the entire omnibus order.

We will notify you in writing if we reject a transfer or if we implement a restriction due to frequent trading or the use of market timing investment strategies. If we do not accept a transfer request, no change will be made to your allocations per that request. We will then allow you to resubmit the rejected transfer by regular mail only.

Additionally, we may in the future take any of the following restrictive actions that are designed to prevent the employment of a frequent trading or market timing strategy:

- not accept transfer instructions from a participant or other person authorized to conduct a transfer;
- limit the number of transfer requests that can be made during a certificate year; and
- require the value transferred into a fund to remain in that fund for a particular period of time before it can be transferred out of the fund.

We will apply any restrictive action we take uniformly to all participants we believe are employing a frequent trading or market timing strategy. These restrictive actions may not work to deter frequent trading or market timing activity.

We reserve the right to revise our procedures for detecting frequent trading and/or market timing at any time without prior notice if we determine it is necessary to do so in order to better detect frequent trading and/or market timing, to comply with state or federal regulatory requirements, or to impose different restrictions on frequent traders and/or market timers. If we modify our procedures, we will apply the new procedure uniformly to all participants.

Transfers During the Income Phase

You may make six transfers between the funds each calendar year. We do not currently deduct a transfer fee, however, we reserve the right to deduct a transfer fee of \$20 per transfer or, if less, 2% of the amount transferred for each transfer allowed in a calendar year as per the certificate.

You cannot transfer from the general account to a fund, but you can transfer from one or more funds to the general account once a certificate year. The minimum amount which you can transfer is \$500 or your entire interest in the fund, if less. After a transfer, the minimum amount which must remain in a fund is \$500 unless you have transferred the entire value.

Transfer Programs

For detailed rules and restrictions pertaining to these programs and instructions for electing a program contact our Service Center.

Overview. We currently offer the following transfer programs:

- 1) Dollar Cost Averaging Program;
- 2) Automatic Rebalancing Program; and
- 3) Interest Sweep Option.

These programs are only available during the accumulation phase of your certificate.

You may only participate in one of these programs at any one time.

Transfers made through a transfer program are not subject to transfer fees and do not count towards any free transfers you may be permitted each year.

We do not charge you for participation in these programs, though we reserve the right to charge for the programs in the future.

Dollar Cost Averaging Program. This program allows you to systematically transfer a set amount from a selected fund to any of the other funds. By allocating amounts on a regular schedule as opposed to allocating the total amount at one particular time, you may be less susceptible to the impact of market fluctuations. Dollar cost averaging does not assure a profit and does not protect you against loss in declining markets. Since dollar cost averaging involves continuous investment in securities regardless of fluctuating price levels of such securities, you should consider your financial ability to continue the program through periods of fluctuating price levels.

Your Dollar Cost Averaging Program will terminate:

- if you withdraw the total certificate value;
- upon payment of the death benefit;
- if the last transfer you selected has been made;
- if there is insufficient certificate value in the source fund to make the transfer; or
- if we receive from you, in good order, a written request or request over the telephone to terminate the program prior to the next scheduled transfer date.

Automatic Rebalancing Program. Over time, the performance of each fund may cause your allocation to shift from your original allocation. You can direct us to automatically rebalance your certificate value allocated to the funds in order to return to your original percentage allocations by selecting our Automatic Rebalancing Program. Certificate value allocated to the fixed account cannot participate in the Automatic Rebalancing Program.

This program will terminate:

- if you withdraw the total certificate value;
- upon payment of the death benefit;
- if we receive from you, in good order, a written request or a request over the telephone to terminate the program; or
- if we receive any unscheduled transfer request.

Interest Sweep Option. Under this program, we will automatically transfer earnings from your certificate value in the fixed account to any one fund or combination of funds that you select. By allocating these earnings to the funds, you can pursue further growth in the value of your certificate through more aggressive investments. However, the Interest Sweep Option does not assure profit and does not protect against loss in declining markets.

This program will terminate:

- if, as the result of a withdrawal, you no longer have certificate value in the non-loaned portion of the fixed account;
- if, at time of transfer, no interest is available for transfer (for example, if the interest earned is required to cover certificate related charges or has been part of a partial withdrawal);
- upon payment of the death benefit; or
- if we receive from you, in good order, a written request or a request over the telephone to terminate the program prior to the next scheduled transfer date.

Withdrawals

Your ability to take a withdrawal may be restricted by certain provisions of the Internal Revenue Code. Furthermore, if your certificate is issued under a qualified plan, your ability to take a withdrawal may be restricted by your plan documents. Income taxes, tax penalties, a contingent deferred sales charge and certain restrictions may apply to any withdrawal you make.

During the accumulation phase you may make either partial or total withdrawals of your certificate value.

When a partial withdrawal is made from a certificate, we reflect the withdrawal as a reduction to the value of the certificate's death benefit. We describe this reduction in the "Death Benefit" section. If we reflect the reduction as a percentage of certificate value withdrawn, the benefit may be reduced by more than the actual dollar amount of the withdrawal. The reduction will be greater when the value of your certificate investment choices is lower due to market performance or other variables. If you withdraw your full certificate value, the certificate terminates and does not provide a death benefit.

We will take any partial withdrawal proportionally from your certificate value in the funds and the non-loaned portion of the fixed account. When making a partial withdrawal, you must withdraw at least \$100 or the entire value in a fund or the non-loaned portion of the fixed account, if less. We require that after you make a partial withdrawal you keep at least \$600 in your certificate unless your withdrawal is a minimum required distribution. We have reserved the right to treat a request for a partial withdrawal that would result in certificate value of less than \$600 as a request for a total withdrawal of certificate value. Partial withdrawals may be subject to a contingent deferred sales charge.

When you make a total withdrawal you will receive the value of your certificate:

- less any contingent deferred sales charge, if applicable;
- less any applicable premium tax;
- less the amount attributable to any outstanding loan, if any, and
- less any purchase payments we credited to your certificate that have not cleared the bank, until they clear the bank.

Requests in Writing. To request a withdrawal in writing, submit in good order to our Service Center, our partial surrender or full surrender form. If your withdrawal involves an exchange or transfer of assets to another financial institution, we also require a "letter of acceptance" from the financial institution.

Requests by Other Means. You may request certain partial and full withdrawals by other means we authorize such as e-mail, telephone, or fax. Contact our Service Center for details.

Withdrawal Effective Date. For written requests, your withdrawal is effective on the business day we receive, in good order, at our Service Center:

- a) our partial surrender or full surrender form; and
- b) if applicable, a "letter of acceptance."

If we receive this item(s) at our Service Center on a non-business day or after our business day closes, your withdrawal request will be effective on the next business day. For e-mail, telephone or fax requests, your withdrawal is effective on the business day we receive your request in good order, provided it is received prior to the close of business. For requests received after the close of the business day, your withdrawal will be effective on the next business day.

Delivery of Withdrawal Amount. We will pay any withdrawal amount within seven days of the withdrawal effective date, unless we are required to suspend or postpone withdrawal payments. See "Other Information – Suspension of Payments or Transfers."

Systematic Withdrawal Program. *For detailed rules and restrictions pertaining to this program and instructions for electing the program contact our Service Center.*

The Systematic Withdrawal Program (SWP) allows you to set up automatic periodic withdrawals from your certificate value. We do not charge you for participation in the SWP, but we reserve the right to charge in the future. We will take any withdrawal under this program proportionally from your certificate value in your selected investment choices.

Your SWP will end:

- if you withdraw your total certificate value;
- if the next systematic withdrawal will lower your certificate value below the minimum certificate value we allow following a partial withdrawal, unless your withdrawal is a minimum required distribution;
- if we receive, in good order, a notification of the participant's death;
- if we receive, in good order, a notification of the annuitant's death if the participant is a non-natural person;
- if we process the last withdrawal you selected;
- if your value in a selected fund or the fixed account is insufficient to complete the withdrawal;
- if you begin receiving annuity payments; or
- if we receive from you, in good order, a written request or a request over the telephone to terminate the program any time before or on the next withdrawal date. If your certificate is a Beneficiary IRA, your SWP cannot be terminated.

Right to Take Loans

In some states, if your certificate is a tax-sheltered annuity, you may be able to take a loan under your certificate. All such loans must conform to the requirements of the Internal Revenue Code and your specific plan. You must request a loan by mailing or faxing all required forms in good order to our Service Center. Loan proceeds generally are mailed within ten business days of the loan being approved.

You are required to repay your loan according to the loan repayment schedule you elect when you request a loan. Loan repayments (including interest due) must be sent to our Service Center and are credited as of the business day received. Loan repayments are due quarterly; however, you may make additional repayments. The first repayment will be due three months after the loan was issued. Any repayment will be applied first to the interest accrued to the date your repayment is received, and then to the loan principal. Loan repayments made in addition to regularly scheduled quarterly repayments will be applied to loan principal only and will not change the due dates or amounts of subsequent quarterly payments, but will shorten the term of the loan.

If you request a loan, we will deduct your requested loan amount from your investment choice(s) in proportion to the non-loaned value of each on the date of your loan request. As long as your loan is outstanding, a portion of your certificate value equal to the loan amount is held in the loaned portion of the fixed account. On each certificate anniversary while a loan is outstanding, an amount of certificate value equal to any due and unpaid loan interest is also transferred to the loaned portion of the fixed account. Upon each loan repayment, we will transfer value equal to the repayment amount from the loaned portion of the fixed account to your investment choice(s) based upon your current purchase payment allocation.

We charge interest daily on any outstanding loan at an effective annual interest rate. Interest is due and payable quarterly (based on the date the loan was taken). We also credit interest on the loan amount held in the loaned portion of the fixed account. The difference between the rate of interest we charge on the loan amount and the rate we credit on the loan amount is the net cost of the loan, which will not exceed 4%.

If a required loan repayment is not paid in full within 90 days after its due date, the total existing loan balance will be determined to be in default. If you default, the outstanding debt will be considered a taxable distribution and we will do appropriate tax reporting. We will withdraw sufficient certificate value to repay the debt to the extent such withdrawals are not restricted under the Internal Revenue Code. If we cannot make such withdrawals because they are restricted under the Internal Revenue Code, the loan will remain outstanding and continue to accrue interest until it is satisfied.

If you own a certificate with an outstanding loan and are taking an eligible distribution of your entire certificate value, we will deduct any outstanding certificate debt from the amount you withdraw. If you make a partial withdrawal, the certificate value remaining after the withdrawal must not be less than:

- the amount of any loan outstanding; plus
- interest on the loan for 12 months based on the loan interest rate then in effect; plus
- any contingent deferred sales charge that would apply to such an amount otherwise withdrawn.

Amounts held in the fixed account equal to the amount of any outstanding loan are not available for withdrawal or transfer. If you do not repay the loan, we will deduct the loan amount from your withdrawal or death benefit.

You may not begin receiving annuity payments if you have an outstanding loan balance.

The maximum number of loans we permit you to take at any one time is three. However, you may not take more than two loans in any calendar year.

Currently, we do not deduct a charge from your certificate if you take a loan under your certificate. However, we reserve the right to deduct a charge not to exceed \$35 from your certificate value as a loan origination fee should it become necessary for us to seek reimbursement for expenses related to the administration of certificate loans.

A loan, whether or not repaid, may have a permanent effect on the death benefit and certificate value because the investment results of the funds and current interest rates credited to the non-loaned portion of the fixed account do not apply to amounts held in the loaned portion of the fixed account. Depending on the investment results of the funds or credited interest rates for the non-loaned portion of the fixed account while the loan is outstanding, the effect could be favorable or unfavorable.

Expenses

This section describes the charges and deductions we make under the certificate to compensate us for the services and benefits we provide, costs and expenses we incur and risks we assume. We may profit from the charges deducted and we may use any such profits for any purpose, including payment of distribution expenses. These charges and deductions reduce the return on your investment in the certificate. These charges and expenses are:

Insurance Charges

Each business day we deduct our insurance charges from the assets of the separate account. We do this as part of our calculation of the value of the accumulation units and the annuity units. The insurance charge has two parts:

- 1) the mortality and expense risk charge; and
- 2) the administrative charge.

Mortality and Expense Risk Charge

This charge is equal, on an annual basis, to 1.03% of the daily value of the assets invested in each fund, after fund expenses are deducted. This charge is for:

- the mortality risk associated with the insurance benefits provided, including our obligation to make annuity payments after the annuity date regardless of how long all annuitants live, the death benefits, and the guarantee of rates used to determine your annuity payments during the income phase; and
- the expense risk that the current charges will be insufficient to cover the actual cost of administering the certificate.

We may increase this charge at any time while you own the certificate, but the charge will never exceed 1.25%.

If the current mortality and expense risk charge is not sufficient to cover the mortality and expense risk, we will bear the loss. If this is the case, we may raise the mortality and expense risk charge in order to restore profitability. In no case will we raise the charge above the guaranteed amount. If the amount of the charge is more than sufficient to cover the mortality and expense risk, we will make a profit on the charge. We may use this profit for any purpose, including the payment of marketing and distribution expenses for the certificate.

Administrative Charge

This charge is equal, on an annual basis, to 0.15% of the daily value of the assets invested in each fund, after fund expenses are deducted. We assess this charge to reimburse us for all the expenses associated with the administration of the certificate and the separate account. Some of these expenses are: preparation of the certificate, confirmations, annual reports and statements, maintenance of certificate records, personnel costs, legal and accounting fees, filing fees, and computer and systems costs. We may increase this charge at any time while you own the certificate, but the charge will never exceed 0.25%.

Annual Certificate Maintenance Charge

Currently, we do not deduct an annual certificate maintenance charge from your certificate. However, we reserve the right to deduct an amount not to exceed \$60 from your certificate at the end of each certificate year as an annual maintenance certificate charge should it become necessary for us to seek reimbursement for expenses relating to the issuance and maintenance of the certificate.

Contingent Deferred Sales Charge

We do not deduct a sales charge when we receive a purchase payment. However, we may assess a contingent deferred sales charge on any amount you withdraw that exceeds the free withdrawal amount. Additionally, we may assess a contingent deferred sales charge on amounts applied to Annuity Option E or F. We use this charge to cover certain expenses relating to the sale of the certificate.

If we assess a contingent deferred sales charge, we will deduct it from the amount that you withdraw or apply to Annuity Option E or F.

The amount of the charge depends on:

- 1) the amount you withdraw or apply to Annuity Option E or F; and
- 2) the length of time between when we issued your certificate and when you make a withdrawal or apply your certificate value to Annuity Option E or F.

The contingent deferred sales charge is assessed as follows:

Certificate Year of Withdrawal or Annuity Date ¹	Charge
1st Year	8%
2nd Year	8%
3rd Year	7%
4th Year	6%
5th Year	5%
6th Year	4%
7th Year	3%
8th Year	2%
9th Year	1%
10th Year and thereafter	0%

¹ See Annuity Options E and F in “The Income Phase – Annuity Options.”

In addition to the free withdrawals described later in this section, we will not impose a contingent deferred sales charge under the following circumstances.

- Upon payment of the death benefit.
- On amounts withdrawn as required minimum distributions (RMDs), to the extent they exceed the free withdrawal amount. In order to qualify for this exception, you must be participating in a systematic withdrawal program established for the payment of RMDs, under which the annual RMD is calculated by us, based solely on the fair market value of the certificate (RMD program). If you choose to take withdrawals to satisfy your RMD for the certificate outside of our RMD program, or if you choose to take withdrawals from the certificate to satisfy your RMD(s) for other qualified assets, contingent deferred sales charge may apply.
- Upon application of the certificate value to any Single Life or Joint and Survivor Life Annuity Option, or to a Period Certain Annuity of at least ten years.
- If you redeem excess contributions from a plan qualifying for special income tax treatment. These types of plans are referred to as qualified plans, including individual retirement annuities (IRAs). We look to the IRC for the definition and description of excess contributions.
- When the certificate is exchanged for another variable annuity contract issued by us or one of our affiliated insurance companies, of the type and class which we determine is eligible for such an exchange. A contingent deferred sales charge may apply to the contract received in the exchange. A reduced contingent deferred sales charge schedule may apply under the certificate if another variable annuity contract issued by us or one of our affiliated insurance companies is exchanged for the certificate. Exchange programs may not be available in all states. We have the right to modify, suspend or terminate any exchange program any time without prior notification. If you want more information about our current exchange programs, contact your registered representative or us at our Service Center.
- If you apply your entire certificate value to purchase a single premium immediate life annuity or a fixed deferred annuity issued by us or one of our affiliates.
- On any withdrawals made or amounts applied to an annuity option when you reach the latest permitted annuity date for your certificate.

Free Withdrawals

In your first certificate year, you may withdraw, without incurring a contingent deferred sales charge, up to 10% of your certificate value as of the beginning of the certificate year reduced by any free withdrawal amount previously taken during the certificate year. Beginning in your second certificate year, you may withdraw up to 10% of your certificate value as of the end

of the previous certificate year reduced by any free withdrawal amount previously taken during the certificate year. You may take the 10% in multiple withdrawals each certificate year.

Premium Taxes

Some states and other governmental entities charge premium taxes or similar taxes. We are responsible for the payment of these taxes and will make a deduction from your certificate value for them, or we may adjust the annuity rates for premium tax assessed. Some of these taxes are due when your certificate is issued, others are due when annuity payments begin. Currently we do not charge you for these taxes until you begin receiving annuity payments or you make a total withdrawal. We may discontinue this practice and assess the charge when the tax is due. Premium taxes generally range from 0% to 3.5%, depending on the state.

Transfer Fee

Currently, you can make an unlimited number of transfers every calendar year during the accumulation phase without charge. During the income phase, we allow six transfers and they currently are not subject to a transfer fee. However, we reserve the right to deduct a transfer fee of \$20 per transfer or, if less, 2% of the amount transferred for each transfer allowed in a calendar year as provided by the certificate.

Income Taxes

We will deduct from the certificate any income taxes which we incur because of the operation of the separate account. At the present time, we are not making any such deductions. We will deduct any withholding taxes required by law.

Fund Expenses

The separate account purchases shares of the funds at net asset value. The net asset value of each fund reflects expenses already deducted from the assets of the fund. Such expenses include investment management fees and other expenses and may include acquired fund fees and expenses. For some funds, expenses may also include 12b-1 fees to cover distribution and/or certain service expenses. When you elect a fund as an investment choice, that fund's expenses will increase the cost of your investment in the certificate. See each fund's prospectus for more information regarding these expenses.

The Income Phase

Overview. If you want to receive regular income from your annuity, you can elect to apply your certificate value so that you can receive fixed and/or variable annuity payments under one of the annuity options described in this section. We may base annuity payments on the age and sex of the annuitant(s) under all options except Annuity Option E. We may require proof of age and sex before annuity payments begin.

If your certificate value is less than \$2,000 on the annuity date, we reserve the right to pay you a lump sum rather than a series of annuity payments. If any annuity payment is less than \$100, we reserve the right to change the payment basis to equivalent less frequent payments.

Annuity Payment Start Date. You can choose the day, month and year in which annuity payments begin. This date must be the 1st through 28th day of the month. We call that date the annuity date. According to your certificate, your annuity date cannot be earlier than five years after you buy the certificate. However, we currently allow you to select an annuity date that is at least 13 months after you purchase your certificate. You may choose your annuity date when you purchase your certificate. After you purchase your certificate you can request an earlier annuity date by notifying us in writing at least 30 days before the annuity date. You can request that we delay your annuity date by notifying us in writing or by telephone any time before or on the annuity date.

Annuity payments must begin by the earlier of:

- 1) the 90th birthday of the annuitant; or
- 2) the latest date permitted under state law.

Upon written request we will defer the annuity date up to the 100th birthday.

Electing an Annuity Option. On the annuity date, we must have written instructions in good order at our Service Center regarding your annuity option choice including whether you want fixed and/or variable payments.

If on the annuity date we do not have your instructions, we will assume you elected Option B with ten years of payments guaranteed. We will use certificate value in the funds to provide a variable portion of each annuity payment and certificate value in the fixed account, if any, to provide a fixed portion of each annuity payment. If your certificate is a qualified certificate, we may default you to a different annuity option in order to comply with requirements applicable to qualified plans.

Required Minimum Distributions for Tax-Qualified Certificates. In order to avoid adverse tax consequences, you should begin to take distributions from your certificate no later than the beginning date required by the IRC. These distributions can be withdrawals or annuity payments. The distributions should be at least equal to the minimum amount required by the IRC or paid through an annuity option that complies with the required minimum distribution rules of IRC Section 401(a)(9). If your certificate is an individual retirement annuity, the required beginning date is no later than April 1 of the calendar year after you reach age 70½. For qualified plans and tax-sheltered annuities, that date is no later than April 1 of the calendar year following the later of: the year you reach age 70½ or the year in which you retire. The option of deferring to retirement is not available if you are a 5% or greater owner of the employer sponsoring your qualified plan.

Fixed Annuity Payments. If you choose fixed payments, the payment amount will not vary. The payment amount will depend upon the following:

- the value of your certificate on the annuity date;
- the annuity option you elect;
- the age and sex of the annuitant or joint annuitants, if applicable;
- the minimum guaranteed payout rates associated with your certificate;
- the deduction of a contingent deferred sales charge (may be deducted under Annuity Options E and F only); and
- the deduction of premium taxes, if applicable.

If the single premium immediate annuity rates offered by MassMutual on the annuity date are more favorable than the minimum guaranteed rates listed in your certificate, those rates will be used.

Variable Annuity Payments. If you choose variable payments, the payment amount will vary with the investment performance of the funds you elect. The first payment amount will depend on the following:

- the value of your certificate on the annuity date;
- the annuity option you elect;
- the age and sex of the annuitant or joint annuitants, if applicable;
- the minimum guaranteed payout rates associated with your certificate;
- an assumed investment rate (AIR) of 4% per year;
- the deduction of a contingent deferred sales charge (may be deducted under Annuity Options E and F only); and
- the deduction of premium taxes, if applicable.

Future variable payments will depend on the performance of the funds you elected. If the actual performance on an annualized basis exceeds the 4% assumed investment rate plus the deductions for expenses, your annuity payments will increase. Similarly, if the actual rate is less than 4% annualized plus the amount of the deductions, your annuity payments will decrease.

Annuity Unit Values. In order to keep track of the value of your variable annuity payment, we use a unit of measure called an annuity unit. The value of your annuity units will fluctuate to reflect the investment performance of the funds you elected. We calculate the number of your annuity units at the beginning of the income phase. During the income phase, the number of annuity units will not change unless you make a transfer; make a withdrawal as permitted under certain annuity options; or you elect an annuity option with reduced payments to the survivor and those payments to the survivor commence. The SAI contains more information on how annuity payments and annuity unit values are calculated.

Annuity Options. The available annuity options are listed in this section in the Annuity Options table. We may consent to other plans of payment in addition to those listed. After annuity payments begin, you cannot change the annuity option, the frequency of annuity payments, or make withdrawals, except as described under Annuity Options E and F.

Limitations on Annuity Options. If you purchased the certificate as a tax-qualified certificate, the IRC may impose restrictions on which annuity option you may elect. Furthermore, if your certificate is issued under an ERISA plan, and you are married when your certificate enters the income phase, your ability to elect certain annuity options may be limited and/or require spousal consent.

Annuity Options

We may consent to other plans of payment in addition to those listed, including a Joint and Last Survivor Annuity with Period Certain.

Lifetime Contingent Options (variable and/or fixed payments)				
	<i>Annuity Option A Life Income</i>	<i>Annuity Option B Life Income with Period Certain</i>	<i>Annuity Option C Joint and Last Survivor Annuity</i>	<i>Annuity Option D Joint and 2/3 Survivor Annuity</i>
Number of Annuitants	One	One	Two	Two
Length of Payment Period	For as long as the annuitant lives.	For a guaranteed period of either 5, 10 or 20 years or as long as the annuitant lives, whichever is longer.	For as long as either annuitant lives.	For as long as either annuitant lives.
Annuity Payments After Death	None. All payments end upon the annuitant's death.	When the annuitant dies, if there are remaining guaranteed payments, the beneficiary may elect to continue receiving remaining guaranteed payments or the beneficiary may elect a lump sum payment equal to the commuted value of the remaining guaranteed annuity payments.	100% of the payment will continue during the lifetime of the surviving annuitant. No payments will continue after the death of both annuitants.	Payments will continue during the lifetime of the surviving annuitant and will be computed on the basis of two-thirds of the annuity payment (or units) in effect during the joint lifetime. No payments will continue after the death of both annuitants.

Non-Lifetime Contingent Options (variable and/or fixed payments)		
	<i>Annuity Option E Period Certain Annuity</i>	<i>Annuity Option F Special Income Settlement Agreement</i>
Number of Annuitants	One	Determined in accordance with terms agreed upon in writing by both you and us.
Length of Payment Period	For a specified period no less than five years and no greater than 30 years.	Determined in accordance with terms agreed upon in writing by both you and us.
Withdrawal Option/ Switch Annuity Option	If, after you begin receiving payments, you would like to receive all or part of the commuted value of the remaining guaranteed payments under this annuity option at any time, you may elect to receive it in a lump sum or have it applied to another annuity option. If you so elect, your future payments will be adjusted accordingly.	If we agree to pay you a variable annuity payment for a specified period of time under this annuity option, and after you begin receiving payments, you would like to receive all or part of the commuted value of the remaining guaranteed payments under this annuity option at any time, you may elect to receive it in a lump sum or have it applied to another annuity option. If you so elect, your future payments will be adjusted accordingly.

Non-Lifetime Contingent Options (variable and/or fixed payments) (continued)		
	<i>Annuity Option E Period Certain Annuity</i>	<i>Annuity Option F Special Income Settlement Agreement</i>
Contingent Deferred Sales Charge	In most states, we will deduct a contingent deferred sales charge if you apply your certificate value to this option and the period certain is less than 10 years. If it is permitted in your state, but we do not deduct a contingent deferred sales charge at that time, we will deduct a contingent deferred sales charge if you subsequently request a commuted lump sum payment to yourself or a commuted value to apply to another annuity option.	
Annuity Payments After Death	When the annuitant dies, if there are remaining guaranteed payments, the beneficiary may elect to continue receiving remaining guaranteed payments or the beneficiary may elect a lump sum payment equal to the commuted value of the remaining guaranteed annuity payments. We will not deduct a contingent deferred sales charge.	

Death Benefit

Death of Participant During the Accumulation Phase. If you die during the accumulation phase, we will pay a death benefit to your primary beneficiary. We will treat any other beneficiary designation on record at the time of death as a contingent beneficiary.

Your beneficiary may request that the death benefit be paid under one of the death benefit options.

Death Benefit Amount During the Accumulation Phase. The death benefit paid will be the amount calculated (and adjusted for any applicable charges) as of the business day we receive proof of death and election of the payment method in good order at our Service Center. From the time the death benefit is determined until complete distribution is made, any amount in a sub-account will be subject to investment risk. As a result, the death benefit amount may increase or decrease over time. The risk is borne by the beneficiary(ies). Before the date you (or the annuitant, if the participant is a non-natural person) reach age 80, the death benefit during the accumulation phase will be the greater of:

- 1) your certificate value, less the amount attributable to any outstanding loan; or
- 2) your purchase payments, adjusted for any withdrawals, less the amount attributable to any outstanding loan, and less any applicable charges.

For certificates issued before May 17, 2004 the words “adjusted for any withdrawals” are replaced with the words “less any withdrawals.” See “Death Benefit – Adjusted for Any Withdrawals or Less Any Withdrawals.”

After you (or the annuitant, if the participant is a non-natural person) reach age 80, the death benefit during the accumulation phase is your certificate value, less the amount attributable to any outstanding loan, as of the business day we receive, in good order, proof of death at our Service Center and election by the beneficiary to receive the death benefit payment under one of the death benefit options provided by the certificate.

References to Age. Age is as of the nearest birthday. For example, age 80 is generally the period of time between age 79 years, 6 months and 1 day and age 80 and 6 months. See “Age.”

Adjusted for Any Withdrawals or Less Any Withdrawals. In this prospectus we describe the formulas we use to determine death benefit amounts. In some formulas we use the language “adjusted for any withdrawals” and in other formulas we use the language “less any withdrawals.” These phrases have different meanings.

Adjusted for Any Withdrawals

If you take a withdrawal, we adjust your death benefit by using the percentage of certificate value withdrawn to lower the death benefit by the same percentage. We use the phrase “adjusted for any withdrawals” to describe this treatment of withdrawals within our formulas. Because this adjustment uses the percent of certificate value withdrawn, the death benefit may be reduced by more than the actual dollar amount of the withdrawal. The reduction will be greater when the value of your certificate investment choices is lower due to market performance or other variables.

Less Any Withdrawals

If you take a withdrawal, we lower your death benefit by subtracting the dollar amount of the withdrawal. We use the phrase “less any withdrawals” to describe this treatment of withdrawals within our formulas.

Death Benefit Options During the Accumulation Phase. The availability of certain death benefit options may be limited in order to comply with the required minimum distribution rules.

A beneficiary must elect to receive the death benefit under one of the following options, in the event you die during the accumulation phase.

- **Option 1** – lump sum payment of the death benefit within five years of the date of death; or
- **Option 2** – payment of the death benefit under an annuity option over the lifetime of the beneficiary or over a period not extending beyond the life expectancy of the beneficiary with distribution beginning within one year of the date of your death.

Options for a Spouse Who is the Sole Primary Beneficiary

In addition to options 1 and 2 above, a spouse who is the sole primary beneficiary has the following options, based on certificate type:

Tax-Sheltered Annuity. If your certificate is a tax-sheltered annuity and your spouse is the sole primary beneficiary, then the surviving spouse may elect to roll-over a lump sum payment of the death benefit into an eligible retirement plan. If the participant was under 70 at the time of death, the spouse may be able to defer the timing of any required distributions under the certificate. You should consult your own tax adviser about your own circumstances.

Individual Retirement Annuity. If your certificate is an individual retirement annuity and your spouse is the sole primary beneficiary, then the surviving spouse may elect:

- i) to roll-over the death benefit to an eligible retirement plan; or
- ii) to continue the certificate as an IRA in his or her own name at the death benefit amount payable and exercise all of the participant's rights under the certificate.

If at the time the participant purchased the certificate the surviving spouse was over the maximum certificate issue age, then the certificate cannot be continued. An election to continue the certificate can only be made once while the certificate is in effect.

These options are not available to a domestic partner or civil union partner. See "Taxes – Civil Unions and Domestic Partnerships" if you are in a domestic partnership or civil union.

Lump Sum Payment. If a lump sum payment is requested, we will pay the amount within seven calendar days after we receive proof of death and election of the payment method in good order at our Service Center, unless we are required to suspend or delay payment.

Benefit Management Account. For lump sum payments of at least \$10,000, your beneficiary may elect to receive the death benefit by establishing an interest-bearing draft account called the Benefit Management Account (BMA). We periodically set the interest rate we credit to the BMA. That rate will not be less than the minimum guaranteed interest rate provided under the BMA. We will send a draftbook to the beneficiary who will have access to all the monies in the account, including interest, by writing a draft for all or part of the proceeds. Our drafts are similar to checks. The minimum draft amount is \$250. If the account balance falls below \$1,000, the BMA will be closed automatically and a check for the remaining balance, including interest, will be sent to the beneficiary. The beneficiary may close the BMA at any time. No deposits may be paid into the BMA. The BMA is part of our general account and is subject to the claims of our creditors. The BMA is not a bank account or bank deposit and is not insured by the Federal Deposit Insurance Corporation. We may make a profit on amounts left in the BMA. If the contract has been assigned, the BMA is not available for the assignee's portion of the death benefit. The BMA may not be available in all states. We reserve the right to make changes in the terms and conditions of the BMA. Election of the BMA shall be treated as an election of a lump sum for tax reporting purposes under IRC Section 72(s) or 401(a)(9). Any interest paid on amounts in the BMA is taxable as ordinary income in the year such interest is credited.

Beneficiary IRA Election. Beneficiary, Inherited, Legacy or "Stretch" IRAs are all terms used to describe an IRA that is used exclusively to distribute death proceeds of an IRA or other qualified investment to the beneficiary over that beneficiary's life expectancy in order to meet the required minimum distribution (RMD) rules. Upon the contract owner's death under an IRA or other qualified contract, a beneficiary(ies) may generally establish a Beneficiary IRA by either purchasing a new annuity contract or in some circumstances, by electing the Beneficiary IRA payout option under the current contract. Until withdrawn, amounts in a Beneficiary IRA or other qualified contract continue to be tax deferred. Amounts withdrawn each year, including amounts that are required to be withdrawn under the RMD rules, are subject to tax.

Eligibility Requirements/Restrictions:

If a beneficiary(ies) elects to establish a Beneficiary IRA after the death of the contract owner, the following rules apply:

- Any withdrawals under a new Beneficiary IRA contract in excess of the RMD may be subject to a contingent deferred sales charge as indicated by the terms of the contract purchased.
- For existing annuity contracts with single beneficiaries issued by us or one of our affiliates, the beneficiary will have the option of electing a Beneficiary IRA payout option under the current contract or establishing a Beneficiary IRA by purchasing a new annuity contract issued by us or one of our affiliates. Should the beneficiary decide to elect the Beneficiary IRA payout option under the current contract, any withdrawals in excess of the RMD will not be subject to a contingent deferred sales charge.

- For existing annuity contracts with multiple beneficiaries issued by us or one of our affiliates, a beneficiary wishing to establish a Beneficiary IRA funded by an annuity contract issued by us or one of our affiliates must purchase a new annuity contract.
- The source of funds to be invested must be from a traditional IRA, SEP IRA, SIMPLE IRA, Beneficiary IRA, TSA, 401(a) or a Qualified Employee Plan (includes Pension Plan, Money Purchase Pension Plan, Profit Sharing Plan, Keogh (HR10), Target Benefit Plan).
- Joint ownership of a Beneficiary IRA is not allowed.
- The annuity contract will be titled in the beneficiary's name as beneficiary for the deceased contract owner. The beneficiary must be the annuitant and the annuitant cannot be changed.
- For non-spousal Beneficiary IRAs, RMDs must begin by December 31st of the year following the year of the date of the contract owner's death. For spousal Beneficiary IRAs, RMDs may be deferred until the year the original owner would have attained age 70½. The RMD amount will generally be calculated based on the beneficiary's life expectancy and will be withdrawn on a proportional basis from all investment accounts in which funds are invested. If the original contract owner died after attaining age 70½ and was younger than the beneficiary, the RMD amount may be calculated based on the original contract owner's life expectancy in the year of his or her death. If there is a Beneficiary IRA previously established with another carrier and an RMD is required in the current calendar year, we will process the RMD. If however, an RMD is not required in the current calendar year, an RMD will not be processed until the year it is required.
- The contract value at time of issue will be equal to either the death benefit that would have been payable to the beneficiary if a lump sum distribution had been elected, or the contract value of an existing Beneficiary IRA that is being transferred to a new MassMutual annuity.
- Additional contributions cannot be applied to the Beneficiary IRA.
- Upon the death of the annuitant of the Beneficiary IRA, a death benefit, under the terms of the contract, will be paid to the succeeding beneficiary in a lump sum or over the annuitant's remaining life expectancy as determined by the applicable IRS table.
- If the beneficiary is a trust, a Beneficiary IRA may only be established if the trust qualifies as a "see-through" trust. For see-through trusts, required minimum distributions must be calculated based upon the life expectancy of the oldest trust beneficiary and the oldest trust beneficiary must be the annuitant. In order to be a see-through trust, the trust must be valid under state law and be irrevocable, and all beneficiaries, current and future, must be identifiable from the trust instrument. If any beneficiary of the trust is not an individual, the trust is not a see-through trust and cannot establish a Beneficiary IRA.
- Additional rules may apply. Please consult your registered representative for further information.
- We have the right to modify, suspend or terminate the Beneficiary IRA program at any time without prior notification.
- A Beneficiary IRA may only be established by the beneficiary of the IRA owner/qualified plan participant whose death triggered the RMD requirements of IRC Section 401(a)(9). A Beneficiary IRA may not be established as a "second generation" Beneficiary IRA by a successor beneficiary.

Beneficiaries should consult a qualified tax adviser for advice prior to establishing a Beneficiary IRA.

Death of Participant During the Income Phase. If you die during the income phase, the primary beneficiary becomes the participant. Additionally, we will pay the remaining payments under the annuity option elected at least as rapidly as under the method of distribution in effect at the time of your death.

Death of Annuitant During the Accumulation Phase or the Income Phase. If the participant is a non-natural entity, and the annuitant dies, we will treat the death of the annuitant as the death of the participant. If the annuitant dies during the income phase, we will pay the remaining payments under the annuity option elected at least as rapidly as under the method of distribution in effect at the time of the annuitant's death.

Taxes

This prospectus describes your certificate, which is a contract between you, the participant, and MassMutual. In this tax discussion, we use the word "contract" to mean "certificate" and "owner" to mean "participant."

The information in this prospectus is general and is not an exhaustive discussion of all tax questions that might arise under the contract. The information is not written or intended as tax or legal advice. You should consult a tax adviser about your own circumstances. In addition, we do not profess to know the likelihood that current federal income tax laws and Treasury Regulations or the current interpretations of the Internal Revenue Code, Regulations, and other guidance will continue. We cannot make any guarantee regarding the future tax treatment of any contract. We reserve the right to make changes in the contract to assure that it continues to qualify as an annuity for tax purposes.

No attempt is made in this prospectus to consider any applicable state or other tax laws.

Taxation of the Company. MassMutual is taxed as a life insurance company under the Internal Revenue Code of 1986, as amended (IRC). For federal income tax purposes, the separate account is not a separate entity from MassMutual, and its operations form a part of MassMutual.

Investment income and any realized gains on separate account assets generally are reflected in the certificate value, although treated as accruing to the Company and not to you. As a result, no taxes are due currently on interest, dividends and short or long-term gains earned by the separate account with respect to your certificate. The Company may be entitled to certain tax benefits related to the investment of Company assets, including assets of the separate account. These tax benefits, which may include foreign tax credits and the corporate dividends received deduction, are not passed back to you since the Company is the owner of the assets from which the tax benefits are derived.

Annuities in General. Annuity contracts are a means of both setting aside money for future needs — usually retirement — and for providing a mechanism to administer the payout of those funds. Congress recognized how important providing for retirement was and created special rules in the IRC for annuities. Simply stated, these rules provide that you will generally not be taxed on the earnings on the money held in your annuity contract until you take the money out. This is referred to as tax deferral.

Diversification. IRC Section 817(h) imposes certain diversification standards on the underlying assets of variable annuity contracts. The IRC provides that a variable annuity contract will not be treated as an annuity contract for any period (and any subsequent period) for which the investments are not, in accordance with regulations prescribed by the United States Treasury Department, adequately diversified. Disqualification of the contract as an annuity contract would result in a loss of tax deferral, meaning the imposition of federal income tax to the owner with respect to earnings under the contract prior to the receipt of payments under the contract. We intend that all investment portfolios underlying the contracts will be managed in such a manner as to comply with these diversification requirements.

Investor Control of Assets. For variable annuity contracts, tax deferral also depends on the insurance company, and not you, having control of the assets held in the separate accounts. You can transfer among the sub-accounts but cannot direct the investments each underlying fund makes. If you have too much investor control of the assets supporting the separate account funds, then you will be taxed on the gain in the contract as it is earned rather than when it is withdrawn. The IRS has provided some guidance on investor control by issuing Revenue Rulings 2003-91 and 2003-92, but some issues remain unclear. One unanswered question is whether an owner will be deemed to own the assets in the contract if a variable contract offers too large a choice of funds in which to invest, and if so, what that number might be. We do not know if the IRS will issue any further guidance on this question. We do not know if any guidance would have a retroactive effect. Consequently, we reserve the right to modify the contract, as necessary, so that you will not be treated as having investor control of the assets held under the separate account.

Qualified Contracts. Your contract is referred to as a qualified contract if it is purchased under a qualified retirement plan (qualified plan) such as an Individual Retirement Annuity (IRA), Roth IRA, tax-sheltered annuity plan (TSA or TSA plan), corporate pension and profit-sharing plan (including 401(k) plans and H.R. 10 plans), or a governmental 457(b) deferred compensation plan. Qualified plans are subject to various limitations on eligibility, contributions, transferability and distributions based on the type of plan. The tax rules regarding qualified plans are very complex and will have differing applications depending on individual facts and circumstances. You should consult a tax adviser as to the tax treatment and suitability of such an investment.

Taxation of participants in each qualified plan varies with the type of plan and terms and conditions of each specific plan. Owners, annuitants and beneficiaries are cautioned that benefits under a qualified plan may be subject to the terms and conditions of the plan regardless of the terms and conditions of the contracts issued pursuant to the plan. Some retirement plans are subject to distribution and other requirements that are not incorporated into our administrative procedures. Owners, participants and beneficiaries are responsible for determining that contributions, distributions and other transactions with respect to the contracts comply with applicable law.

Contracts issued under a qualified plan include special provisions restricting contract provisions that may otherwise be available as described in this prospectus. Generally, contracts issued under a qualified plan are not transferable. Various penalty and excise taxes may apply to contributions or distributions made in violation of applicable limitations. Furthermore, certain withdrawal penalties and restrictions may apply to distributions from qualified contracts. See “Taxes – Taxation of Qualified Contracts.”

Eligible rollover distributions from an IRA, TSA, qualified plan or governmental 457(b) deferred compensation plan may generally be rolled over into another IRA, TSA, qualified plan or governmental 457(b) deferred compensation plan, if permitted by the plan. These amounts may be transferred directly from one qualified plan or account to another, or as an indirect rollover, in which the plan participant receives a distribution from the qualified plan or account, and reinvests it in the receiving qualified plan or account within 60 days of receiving the distribution.

IRC Section 408(d)(3)(B) provides that an individual is only permitted to make one indirect rollover from an IRA to another IRA in any one year period. The IRS previously applied this limitation on an IRA-by-IRA basis, allowing a taxpayer to make an

indirect rollover from an IRA, so long as he or she had not made an indirect rollover from that same IRA within the preceding one year period, even if he or she had made indirect rollovers from a different IRA. Effective for distributions on or after January 1, 2015, the limitation applies on an aggregate basis, meaning that an individual cannot make an indirect rollover from one IRA to another if he or she has made an indirect rollover involving any IRA (including a Roth, SEP, or SIMPLE IRA) within one year. It is important to note that the one rollover per year limitation does not apply to amounts transferred directly between IRAs in a trustee-to-trustee transfer.

On July 6, 1983, the Supreme Court decided in *Arizona Governing Committee v. Norris* that optional annuity benefits provided under an employer's deferred compensation plan could not, under Title VII of the Civil Rights Act of 1964, vary between men and women. The contracts we sell in connection with qualified plans use annuity tables which do not differentiate on the basis of sex. Such annuity tables are also available for use in connection with certain non-qualified deferred compensation plans.

Following are general descriptions of the types of qualified plans with which the contracts may be used. Such descriptions are not exhaustive and are for general informational purposes only. The tax rules regarding qualified plans are very complex and will have differing applications depending on individual facts and circumstances. You should consult a tax adviser as to the tax treatment and suitability of your investment. The contribution limits referenced in the plan descriptions below are the limits for 2019, and may change in subsequent years.

Individual Retirement Annuities

IRC Section 408(b) permits eligible individuals to contribute to an individual retirement program known as an Individual Retirement Annuity (IRA). IRAs are subject to limitations on eligibility, contributions, transferability and distributions. See "Taxes – Taxation of Qualified Contracts." IRA contributions are limited to the lesser of \$6,000 or 100% of compensation, and an additional catch-up contribution of \$1,000 is available for individuals age 50 and over. Contributions are deductible, unless you are an active participant in a qualified plan and your modified adjusted gross income exceeds certain limits. Contracts issued for use with IRAs are subject to special requirements by the IRC, including the requirement that certain informational disclosure be given to persons desiring to establish an IRA. You should consult a tax adviser as to the tax treatment and suitability of such an investment.

Tax-Sheltered Annuities

IRC Section 403(b) permits certain eligible employers to purchase annuity contracts, known as Tax-Sheltered Annuities (TSAs), under a section 403(b) program. Eligible employers are organizations that are exempt from tax under IRC Section 501(c)(3) and public educational organizations. Contributions made to a TSA and the earnings on those contributions are generally not included in gross income of the employee until distributed from the plan. TSAs are subject to limitations on contributions, which may be made as "elective deferrals" (contributions made pursuant to a salary reduction agreement) or as non-elective or matching contributions by an employer. In general, annual contributions made by an employer and employee to a TSA may not exceed the lesser of:

- i) \$56,000; or
- ii) 100% of includible compensation (a maximum of \$280,000 of includible compensation may be considered).

An employee's elective salary reduction contributions are limited to \$19,000. In addition, certain catch-up contributions may be made by eligible participants age 50 or over and those with 15 or more years of service with the same employer. TSAs are subject to additional restrictions, including on such items as: the form, manner and timing of distributions; transferability of benefits; vesting and nonforfeiture of interests; nondiscrimination in eligibility and participation; and the tax treatment of distributions, withdrawals and surrenders. See "Taxes – Tax-Sheltered Annuities Taxation and Withdrawal Restrictions." You should consult a tax adviser as to the tax treatment and suitability of such an investment.

Governmental 457(b) Deferred Compensation Plans

Employees of (and independent contractors who perform services for) certain state and local governmental units, or certain tax-exempt employers, may participate in an IRC Section 457(b) plan of the employer, allowing them to defer part of their salary or other compensation. Contributions made to an IRC Section 457(b) plan and the earnings on those contributions are generally not included in gross income of the employee until distributed from the plan. IRC Section 457(b) deferrals are limited to the lesser of:

- i) \$19,000; or
- ii) 100% of includible compensation.

In addition, certain catch-up contributions may be made by eligible participants age 50 or over, and those within three years of normal retirement age under the plan. The contract purchased is issued to the employer or trustee, as applicable. All contract value in a governmental 457(b) deferred compensation plan must be held for the exclusive benefit of the employee, and such plans are subject to limitations on distributions. See "Taxes – Withdrawal Restrictions – Governmental 457(b) Deferred Compensation Contract." You should consult a tax adviser as to the tax treatment and suitability of such an investment.

Taxation of Qualified Contracts. If you have no cost basis for your interest in a qualified contract, the full amount of any distribution is taxable to you as ordinary income. If you do have a cost basis for all or some of your interest, a portion of the

distribution is taxable, generally based on the ratio of your cost basis to your total contract value. Special tax rules may be available for certain distributions from a qualified plan.

IRC Section 72(t) imposes a 10% penalty tax on the taxable portion of any distribution from qualified plans, including contracts issued and qualified under IRC Sections 401 (pension and profit-sharing plans), 403 (TSAs), 408 (IRAs), and 408A (Roth IRAs). Exceptions from the penalty tax are as follows:

- 1) distributions made on or after you reach age 59½;
- 2) distributions made after your death;
- 3) distributions made that are attributable to the employee being disabled as defined in the IRC;
- 4) after severance from employment, distributions that are part of a series of substantially equal periodic payments made not less frequently than annually for your life (or life expectancy) or the joint lives (or joint life expectancies) of you and your designated beneficiary (in applying this exception to distributions from IRAs, a severance of employment is not required);
- 5) distributions made after severance from employment if you have reached age 55 (not applicable to distributions from IRAs);
- 6) distributions made to you up to the amount allowable as a deduction to you under IRC Section 213 for amounts you paid during the taxable year for medical care;
- 7) distributions made on account of an IRS levy made on a qualified retirement plan or IRA;
- 8) distributions made to an alternate payee pursuant to a qualified domestic relations order (not applicable to distributions from IRAs);
- 9) distributions from an IRA for the purchase of medical insurance (as described in IRC Section 213(d)(1)(D)) for you and your spouse and dependents if you received unemployment compensation for at least 12 weeks and have not been re-employed for at least 60 days;
- 10) certain qualified reservist distributions;
- 11) distributions from an IRA to the extent they do not exceed your qualified higher education expenses (as defined in IRC Section 72(t)(7)) for the taxable year; and
- 12) distributions from an IRA which are qualified first-time homebuyer distributions (as defined in IRC Section 72(t)(8)).

With respect to (4) above, if the series of substantially equal periodic payments is modified before the later of your attaining age 59½ or five years from the date of the first periodic payment, then the tax for the year of the modification is increased by an amount equal to the tax which would have been imposed (the 10% penalty tax) but for the exception, plus interest for the tax years in which the exception was used. The IRS has indicated that a modification will occur if, after the first valuation date, there is:

- i) any addition to the account balance other than gains or losses;
- ii) any non-taxable transfer of a portion of the account balance to another retirement plan; or
- iii) a rollover by the individual of the amount received resulting in such amount not being taxable.

The rules governing substantially equal periodic payments are complex. You should consult a tax adviser or IRS Revenue Ruling 2002-62 for more specific information.

Tax-Sheltered Annuities Taxation and Withdrawal Restrictions. Under IRS regulations, effective January 1, 2009, all TSA plans must have a written plan document which specifies the requirements that each contract must meet in order to be qualified under the plan. In addition, the document must provide a list of the providers and contracts that are permitted to be purchased by TSA plan participants under the plan. TSA plan participants should be aware that if a TSA plan removes the provider or specific contract type that the TSA plan participant owns from its approved list, the TSA plan participant may be restricted from making further salary reduction contributions into that contract. TSA plans also have the right to restrict the ability to take loans and hardship withdrawals from a TSA contract. Because a plan participant may own more than one TSA contract, before we process a transaction we may require the TSA plan to approve the transaction to ensure that rules regarding loans, hardships and distribution restrictions are met. TSA plan participants should contact their individual TSA plan to determine the specific rules that apply to them.

The IRS regulations also make significant changes to Revenue Ruling 90-24 exchanges or transfers. Under the regulations an exchange may only be done when the TSA plan allows TSA exchanges under its plan and the provider of the new TSA contract agrees to share information with the TSA plan to ensure that the requirements of the TSA plan are met. Given this restriction, before a TSA exchange is processed, the TSA plan is required to approve the transaction or provide a list of vendors for which it has an information sharing agreement (ISA). Additionally, because most of the regulations were not effective until 2009, there was great uncertainty about their application to contract exchanges that took place between September 24, 2007 and January 1, 2009. Because of this uncertainty, it is possible that an exchange that took place prior to January 1, 2009 caused a TSA plan participant to incur taxation on the value of the contract. However, it is also possible that such an exchange did not have adverse

tax consequences. If a TSA plan participant exchanged a contract to a TSA contract with a provider that does not have an ISA with the TSA plan, the participant had until July 1, 2009 to avoid adverse tax consequences by exchanging the contract for a TSA contract with which the TSA plan does have an ISA.

The IRC limits the withdrawal of purchase payments made by TSA plan participants through salary reductions from certain TSAs. Withdrawals of salary reduction amounts and their earnings can be made when a TSA plan participant:

- 1) reaches age 59½;
- 2) has a severance from employment;
- 3) dies;
- 4) becomes disabled, as that term is defined in the IRC; or
- 5) the TSA plan terminates (starting January 1, 2009).

In the case of hardship, the TSA plan participant can only withdraw the purchase payments and not any earnings. The TSA plan participant is required to suspend salary reduction contributions to any other TSA contract for a six-month period following the date of hardship distribution.

TSA contract value as of December 31, 1988 and contract amounts attributable to service with a former employer are not subject to these restrictions. Additionally, return of excess contributions or amounts paid to a spouse as a result of a qualified domestic relations order are not subject to these restrictions.

TSA contracts issued January 1, 2009 and after are subject to distribution restrictions on employer contributions. These restrictions are determined by the TSA plan and can be based on criteria such as completing years of service or attaining a stated age.

Withdrawal Restrictions – Governmental 457(b) Deferred Compensation Contract. Amounts may not be paid to a participant of a governmental 457(b) deferred compensation plan prior to the participant's:

- attainment of age 70½;
- severance from employment;
- incurring an unforeseeable emergency; or
- compliance with a qualified domestic relations order (QDRO).

In certain circumstances, amounts may also be distributed upon termination of the deferred compensation plan or if the contract contains \$5,000 or less, as provided by the plan.

Governmental 457(b) deferred compensation plans are subject to the required minimum distribution rules of IRC Section 401(a)(9). The sections of this prospectus related to qualified contracts contain more detailed information regarding these rules.

Required Minimum Distributions for Qualified Contracts. For qualified contracts, distributions generally must begin no later than April 1st of the calendar year following the later of:

- a) the calendar year in which you attain age 70½; or
- b) the calendar year in which you retire.

The date set forth in (b) does not apply to an IRA or to a five-percent owner of the employer maintaining the plan. Required distributions generally must be over a period not exceeding your life or life expectancy or the joint lives or joint life expectancies of you and your designated beneficiary. Upon your death, additional distribution requirements are imposed. If your contract has not entered the income phase and your death occurs after your required beginning date, distributions must be made at least as rapidly as under the method in effect at the time of your death or over the life or life expectancy of the designated beneficiary. If your contract has not entered the income phase and your death occurs before your required beginning date, the remaining interest must be distributed within five years or over the life or life expectancy of the designated beneficiary. If your death occurs after your contract has entered the income phase, distributions must be made at least as rapidly as under the method in effect at the time of your death. If required minimum distributions are not made, a 50% penalty tax is imposed on the amount that should have been distributed.

The Regulations under IRC Section 401(a)(9) include a provision that could increase the dollar amount of required minimum distributions for individuals who fund their IRA or qualified retirement plan with an annuity contract. During the accumulation phase of the annuity contract, Treasury Regulations Section 1.401(a)(9)-6, Q&A-12 requires that individuals add the actuarial present value of any additional benefits provided under the annuity (such as certain living or death benefits) to the dollar amount credited to the owner or beneficiary under the contract in order to determine the fair market value of the contract. A larger fair market value will result in the calculation of a higher required minimum distribution amount. You should consult a tax adviser to determine how this may impact your specific circumstances.

Income Tax Reporting and Withholding. Federal law requires that we file an information return on Form 1099-R with the IRS (with a copy to you) reporting any taxable amounts paid to you under the annuity contract. By January 31st of the calendar

year following the year of any payment(s), we will issue the Form 1099-R to the owner of the annuity contract. Following the death of the owner the Form 1099-R will be sent to each beneficiary who receives a payment under the contract.

The portion of any distribution that is includible in the gross income of the owner is subject to federal income tax withholding. The amount of the withholding depends on the type of distribution. Withholding for periodic payments is at the same rate as wages and at the rate of 10% from non-periodic payments. However, the owner, in most cases, may elect not to have taxes withheld or to have withholding done at a different rate (but not lower). Distributions from certain retirement plans, excluding IRAs, that are not directly rolled over to another eligible retirement plan or IRA, are subject to a mandatory 20% withholding. The 20% withholding requirement generally does not apply to:

- a) a series of substantially equal payments made at least annually for:
 - i) the life or life expectancy of the owner, or joint and last survivor expectancy of the owner and a designated beneficiary; or
 - ii) for a specified period of ten years or more;
- b) distributions which are required minimum distributions; or
- c) hardship distributions from a 401(k) plan or a tax-sheltered annuity.

You should consult a tax adviser regarding withholding requirements.

Generation Skipping Transfer Tax Withholding. Under certain circumstances, the IRC may impose a generation skipping transfer tax when all or part of an annuity contract is transferred to, or a death benefit is paid to, an individual two or more generations younger than the owner. Regulations issued under the IRC may require us to deduct the tax from your contract, or from any applicable payment, and pay it directly to the IRS.

Non-Resident Aliens and Foreign Entities. Generally, a distribution from a contract to a non-resident alien or foreign entity is subject to federal tax withholding at a rate of 30% of the amount of income that is distributed. A non-resident alien is a person who is neither a citizen, nor a resident, of the United States of America (U.S.). We are required to withhold the tax and send it to the IRS. Some distributions to non-resident aliens or foreign entities may be subject to a lower (or no) tax if a treaty applies. In order to obtain the benefits of such a treaty, the non-resident alien must claim the treaty benefit on Form W-8BEN (or the equivalent form), providing us with:

- 1) proof of residency (in accordance with IRS requirements); and
- 2) the applicable individual taxpayer identification number.

If the above conditions are not met, we will withhold 30% of the income from the distribution. Additionally, under the Foreign Account Tax Compliance Act effective July 1, 2014, U.S. withholding may occur with respect to certain entity owners (including foreign financial institutions and non-financial foreign entities (such as corporations, partnerships, and trusts)) at a 30% rate without regard to lower treaty rates.

Civil Unions and Domestic Partnerships. Parties to a civil union or domestic partnership are not treated as spouses under federal law. You should consult a tax adviser for more information on this subject.

Other Information

Distribution

The certificates are no longer for sale to the public. Pursuant to separate underwriting agreements with the Company, on its own behalf and on behalf of the separate account, MML Investors Services, LLC (MMLIS), a subsidiary of MassMutual, serves as principal underwriter of the certificates sold by its registered representatives, and MML Strategic Distributors, LLC (MSD), a subsidiary of MassMutual, serves as principal underwriter of the certificates sold by registered representatives of other broker-dealers who have entered into distribution agreements with MSD.

Both MMLIS and MSD are registered with the SEC as broker-dealers under the Securities Exchange Act of 1934 and are members of the Financial Industry Regulatory Authority (FINRA). Commissions for sales of the certificate by MMLIS registered representatives are paid on behalf of MMLIS to its registered representatives. Commissions for sales of the certificate by registered representatives of other broker-dealers are paid on behalf of MSD to those broker-dealers. MMLIS and MSD also receive compensation for their actions as principal underwriters of the certificates. We also pay expense allowances in connection with the sales of the certificates. The maximum commission payable for the certificate is 8.63% of purchase payments made to a certificate and/or up to 2.4% of certificate value annually.

Additional Compensation Paid to MMLIS. Most MMLIS registered representatives are also MassMutual insurance agents, and as such, are eligible for certain cash and non-cash benefits from MassMutual. Cash compensation includes bonuses and allowances based on factors such as sales, productivity and persistency. Non-cash compensation includes various recognition

items such as prizes and awards as well as attendance at, and payment of the costs associated with attendance at, conferences, seminars and recognition trips, and also includes contributions to certain individual plans such as pension and medical plans. Sales of the certificate may help these registered representatives and their supervisors qualify for such benefits. MMLIS registered representatives who are also general agents or sales managers of MassMutual also may receive overrides, allowances and other compensation that is based on sales of the certificate by their registered representatives.

Additional Compensation Paid to Certain Broker-Dealers. We and MSD make additional commission payments to certain broker-dealers in the form of asset-based payments and sales-based payments. We also make cash payments and non-cash payments to certain broker-dealers. The asset-based and sales-based payments are made to participate in those broker-dealers' preferred provider programs or marketing support programs, or to otherwise promote the certificate. Asset-based payments are based on the value of the assets in the MassMutual certificates sold by that broker-dealer. Sales-based payments are paid on each sale of the certificate and each subsequent purchase payment applied to the certificate. Cash payments are made to attend sales conferences and educational seminars sponsored by certain broker-dealers. Non-cash payments include various promotional items. **For a list of the broker-dealers to whom we currently pay additional compensation for selling the certificate, visit www.MassMutual.com/legal/compensation-arrangements or call our Service Center at the number shown on page 1 of this prospectus.**

The additional compensation arrangements described in the preceding paragraphs are not offered to all broker-dealers and the terms of such arrangements may differ among broker-dealers. Some broker-dealers may receive two or more of these payments. Such payments may give us greater access to the registered representatives of the broker-dealers that receive such compensation or may influence the way that a broker-dealer markets the certificate. Any such compensation will be paid by MSD or us and will not result in any additional direct charge to you.

The additional compensation arrangements may provide a registered representative with an incentive to sell the certificate over other available variable annuity certificates whose issuers do not provide such compensation or who provide lower levels of such compensation. Your registered representative typically receives a portion of the compensation that is payable to his or her broker-dealer, depending on the agreement between the representative and their firm. MassMutual is not involved in determining compensation paid to a registered representative of an unaffiliated broker-dealer. You may contact your broker-dealer or registered representative to find out more information about the compensation they may receive in connection with your purchase of a certificate. You may want to take these compensation arrangements into account when evaluating any recommendations regarding the certificate.

We intend to recoup a portion of the cash and non-cash compensation payments that we make through the assessment of certain charges described in this prospectus, including the contingent deferred sales charge. We may also use some of the 12b-1 distribution fee payments and other payments that we receive from certain funds to help us make these cash and non-cash payments.

Assignment

If your certificate is issued as a 403(b) tax-sheltered annuity or an individual retirement annuity, you cannot assign your certificate. If your certificate is issued pursuant to a qualified plan other than an individual retirement annuity, there may be limitations on your ability to assign your certificate. If you assign your certificate, your rights may only be exercised with the consent of the assignee of record. In certain states, you cannot assign the certificate without our approval. We will refuse or accept any request to assign the certificate on a non-discriminatory basis. Please refer to your certificate.

We must receive written notice, in good order, of the assignment, for any assignment we allow to be binding on us. We are not responsible for the validity of an assignment.

Unclaimed Property

Every state has some form of unclaimed property law that imposes varying legal and practical obligations on insurers and, indirectly, on contract owners, beneficiaries, and any other payees of proceeds from a contract. Unclaimed property laws generally provide for the transfer of benefits or payments under various circumstances to the abandoned property division or unclaimed property office in the state of last residence. This process is known as escheatment. To help avoid escheatment, keep your own information, as well as beneficiary and any other payee information up-to-date, including: full names, postal and electronic media addresses, telephone numbers, dates of birth, and social security numbers. To update this information, contact our Service Center.

Voting Rights

We are the legal owner of the fund shares. When a fund solicits proxies in conjunction with a vote of shareholders, we are required to obtain, from you and other participants, instructions as to how to vote those shares. When we receive those instructions, we will vote all of the shares for which we have not received voting instructions, in proportion to those instructions. This will also include any shares that we own on our own behalf. This may result in a small number of participants controlling the outcome of the vote. If we determine that we are no longer required to comply with the above, we will vote the shares in our own right.

During the accumulation phase of your certificate, we determine the number of shares you may vote by dividing your certificate value in each fund, if any, by \$100. Fractional shares are counted. During the income phase or after the annuitant dies, we determine the number of shares you may vote based on our liability for future variable monthly annuity payments.

Changes to the Certificate

We reserve the right to amend the certificate to meet the requirements of applicable federal or state laws or regulations, or as otherwise provided in the certificate. We will notify you by written notice of such amendments.

Suspension of Payments or Transfers

We may be required to suspend or postpone transfers from the funds or payments from the funds for withdrawals or death benefits during any period when:

- the NYSE is closed (other than customary weekend and holiday closings);
- trading on the NYSE is restricted;
- an emergency exists as a result of which disposal of shares of the funds is not reasonably practicable or we cannot reasonably value the shares of the funds; or
- during any other period when the SEC, by order, so permits for your protection.

We reserve the right to defer payment for a withdrawal from the fixed account or payment of loan proceeds from the fixed account for the period permitted by law but not for more than six months.

If, pursuant to the SEC's rules, a money market fund (Fund) suspends payment of redemption proceeds in connection with a liquidation of the Fund, we will delay payment of any transfer, withdrawal or death benefit from the applicable money market sub-account until the Fund is liquidated.

Termination of Certificate

We will terminate your certificate upon the occurrence of any of the following events:

- 1) the date of the last annuity payment;
- 2) the date payment is made of the entire certificate value;
- 3) the date of the last payment upon death to the last beneficiary; or
- 4) the date your certificate is returned under the right to examine certificate provision.

Anti-Money Laundering

Federal laws designed to counter terrorism and prevent money laundering might, in certain circumstances, require us to reject a purchase payment or block a participant's ability to make certain transactions and thereby refuse to accept any request for transfers, withdrawals, or death benefits, until instructions are received from the appropriate regulator. We may also be required to provide additional information about you and your certificate to government regulators.

Our Ability to Make Payments Under the Contract

Our Claims Paying Ability. Our "claims-paying ability" is our ability to meet any contractual obligation we have to make payments under the contract. These amounts include death benefits, annuity payments, withdrawals and any amounts paid out through the contract's additional features. It is important to note that there is no guarantee that we will always be able to meet our claims-paying obligations, and as with any insurance product, there are risks to purchasing the contract. For this reason, you should consider our financial strength and claims-paying ability to meet our obligations under the contract when purchasing a contract and making investment decisions.

Obligations of Our Separate Account. Contract value you allocate to the funds is maintained in our separate account. Any withdrawals or transfers of contract value from the funds will be taken from the separate account. We cannot use the separate account's assets to pay any of our liabilities other than those arising from the contracts. See "Investment Choices – The Separate Account."

Obligations of Our General Account. Contract value you allocate to the fixed accounts is maintained in our general account. The assets of our general account support our insurance and annuity obligations and are subject to our general liabilities from our business operations and to claims by our creditors. We use general account assets for many purposes including to pay death benefits, annuity payments, withdrawals and transfers from the fixed accounts and to pay amounts we provide to you through an elected additional feature that are in excess of your contract value allocated to the separate account.

Because of exemptive and exclusionary provisions, the general account, unlike the separate account, has not been registered under the 1933 Act or the 1940 Act. Because of this, the general account is generally not subject to the provisions of the 1933 Act

or the 1940 Act. However, disclosures regarding the general account are subject to certain generally applicable provisions of the federal securities laws that require complete and accurate statements in prospectuses.

Our Financial Statements

We encourage both existing and prospective owners to read and understand our financial statements and those of the separate account. Our audited statutory financial statements and the separate account's audited U.S. GAAP financial statements are included in the SAI. You can request an SAI by contacting our Service Center at the number or address on page 1 of this prospectus.

Computer System Failures and Cybersecurity

The Company and its business partners rely on computer systems to conduct business, including customer service, marketing and sales activities, customer relationship management and producing financial statements. While the Company and its business partners have policies, procedures, automation and backup plans designed to prevent or limit the effect of failures, our respective computer systems may be vulnerable to disruptions or breaches as the result of natural disasters, man-made disasters, criminal activity, pandemics, or other events beyond our control. The failure of our or our business partners' computer systems for any reason could disrupt operations, result in the loss of customer business and adversely impact profitability.

The Company and its business partners retain confidential information on our respective computer systems, including customer information and proprietary business information. Any compromise of the security of our or our business partners' computer systems that results in the disclosure of personally identifiable customer information could damage our reputation, expose us to litigation, increase regulatory scrutiny and require us to incur significant technical, legal, and other expenses.

Legal Proceedings

The Company is subject to legal and regulatory actions, including class action lawsuits, in the ordinary course of its business. Our pending legal and regulatory actions include proceedings specific to us, as well as proceedings generally applicable to business practices in the industry in which we operate. From time to time, we also are subject to governmental and administrative proceedings and regulatory inquiries, examinations, and investigations in the ordinary course of our business. In addition, we, along with other industry participants, may occasionally be subject to investigations, examinations, and inquiries (in some cases industry-wide) concerning issues upon which regulators have decided to focus. Some of these proceedings involve requests for substantial and/or unspecified amounts, including compensatory or punitive damages.

While it is not possible to predict with certainty the ultimate outcome of any pending litigation proceedings or regulatory action, management believes, based on information currently known to it, that the ultimate outcome of all pending litigation and regulatory matters, after consideration of applicable reserves and rights to indemnification, is not likely to have a material adverse effect upon the Separate Account, the ability of the principal underwriter(s) to perform in accordance with its contracts with the Company on behalf of the Separate Account, or the ability of the Company to meet its obligations under the contract.

For more information regarding the Company's litigation and other legal proceedings, see the notes to the Company's financial statements contained within the SAI.

Table of Contents of the Statement of Additional Information

Assignment of Certificate

Distribution

Accumulation Units and Unit Value

Transfers During the Income Phase

Payment of Death Benefit

Annuity Payments

Experts

Financial Statements

To obtain a free copy of the Statement of Additional Information, return this request form to the address shown below or call our Service Center at (800) 272-2216.

To: MassMutual
Document Management Services — Annuities W360
P.O. Box 9067
Springfield, MA 01102-9067

Please send me the **Statement of Additional Information** for MassMutual Artistry (AN6103NSAI).

Name _____

Address _____

City _____ State _____ Zip _____

Telephone _____

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Appendix A

Condensed Financial Information

The following schedules include accumulation unit values for the periods indicated. We have extracted some of this data from the separate account's audited financial statements. You should read this information in conjunction with the separate account's audited financial statements and related notes that are included in the Statement of Additional Information.

Accumulation Unit Values

Sub-Account	Dec. 31, 2018	Dec. 17, 2017	Dec. 31, 2016	Dec. 31, 2015	Dec. 31, 2014	Dec. 31, 2013	Dec. 31, 2012	Dec. 31, 2011	Dec. 31, 2010	Dec. 31, 2009	Value at Inception Date
Fidelity® VIP Contrafund®	\$25.61	\$27.68	\$22.98	\$21.53	\$21.64	\$19.56	\$15.08	\$13.11	\$13.60	\$11.74	\$ 8.27(a)
Invesco V.I. Diversified Dividend	10.53	11.53	10.75	9.47	9.39	8.42	6.50	5.54	5.73	5.25	10.39(a)
Invesco V.I. Health Care	22.05	22.11	19.31	22.07	21.65	18.31	13.18	11.03	10.74	10.32	9.52(a)
Invesco V.I. Technology	6.03	6.13	4.59	4.68	4.44	4.04	3.27	2.97	3.17	2.64	4.26(a)
MML Aggressive Allocation	16.92	18.63	15.88	14.80	15.10	14.44	11.47	10.03	10.34	9.01	10.00(c)
MML Asset Allocation (i)	—	—	—	—	—	—	—	13.36	13.30	11.95	10.00(b)
MML Balanced Allocation	15.01	15.90	14.43	13.76	13.97	13.42	11.86	10.68	10.62	9.53	10.00(c)
MML Blend	20.87	22.07	19.38	17.92	18.12	16.52	13.89	12.48	12.05	10.84	9.22(a)
MML Blue Chip Growth	39.05	38.79	28.81	28.89	26.31	24.40	17.47	14.94	14.91	12.99	10.00(b)
MML China (d)	—	—	—	—	—	16.62	15.11	12.21	15.28	14.80	10.00(e)
MML Concentrated Growth (i)	—	—	—	—	—	—	—	6.09	6.21	5.51	7.08(a)
MML Conservative Allocation	14.77	15.49	14.30	13.68	13.89	13.37	12.15	11.04	10.89	9.85	10.00(c)
MML Core Allocation *	20.06	21.34	18.78	17.44	17.85	16.71	14.30	12.95	13.13	12.17	10.00(e)
MML Emerging Growth (i)	—	—	—	—	—	—	—	4.95	5.36	4.32	6.76(a)
MML Enhanced Index Core Equity (i)	—	—	—	—	—	—	—	14.21	14.01	12.42	10.00(b)
MML Equity	17.58	19.76	17.27	15.52	16.26	14.75	11.20	9.76	10.26	9.05	9.38(a)
MML Equity Income	26.22	29.27	25.46	21.71	23.59	22.19	17.28	14.91	15.20	13.38	10.00(b)
MML Equity Index	17.87	19.00	15.84	14.38	14.41	12.88	9.89	8.66	8.62	7.62	8.13(a)
MML Focused Equity	19.47	19.51	16.23	13.95	15.54	14.04	10.32	—	—	—	10.00(f)
MML Foreign	12.30	14.80	12.30	12.27	12.96	14.09	11.80	10.03	11.27	10.89	8.72(a)
MML Fundamental Growth	18.51	18.61	14.79	14.45	13.81	12.61	9.67	—	—	—	10.00(f)
MML Fundamental Value	15.52	17.56	15.48	13.86	14.48	13.20	10.23	—	—	—	10.00(f)
MML Global	9.82	10.99	8.95	8.42	8.64	8.40	6.63	5.42	5.72	5.13	7.07(a)
MML Growth *	31.55	32.14	25.45	23.62	22.46	21.05	16.44	14.17	15.05	12.89	10.00(e)
MML Growth & Income	25.44	27.16	22.22	20.67	20.81	18.94	14.46	12.24	12.62	11.46	10.00(b)
MML Growth Allocation	16.19	17.60	15.34	14.43	14.71	14.07	11.61	10.26	10.43	9.18	10.00(c)
MML High Yield	15.81	16.59	15.56	13.54	13.89	13.96	12.77	11.09	10.61	—	10.00(g)
MML Income & Growth	15.81	18.11	15.61	13.57	13.74	12.73	10.34	9.34	8.95	8.11	8.53(a)
MML Inflation-Protected and Income	13.97	14.33	14.04	13.51	13.88	13.57	15.04	14.24	12.69	12.05	10.00(b)

Sub-Account	Dec. 31, 2018	Dec. 17, 2017	Dec. 31, 2016	Dec. 31, 2015	Dec. 31, 2014	Dec. 31, 2013	Dec. 31, 2012	Dec. 31, 2011	Dec. 31, 2010	Dec. 31, 2009	Value at Inception Date
MML International *	\$17.15	\$20.07	\$15.43	\$15.16	\$16.13	\$16.85	\$14.08	\$12.14	\$14.34	\$13.58	\$10.00(e)
MML International Equity	8.84	11.78	9.16	8.58	9.15	—	—	—	—	—	10.00(h)
MML Large Cap Growth	13.66	14.14	10.72	10.88	10.48	9.68	7.33	6.41	6.73	5.73	7.41(a)
MML Managed Bond	18.93	19.24	18.60	18.32	18.67	17.75	18.26	17.47	16.47	15.58	10.74(a)
MML Managed Volatility	14.64	15.55	14.43	14.08	13.83	13.41	11.51	10.29	10.84	9.76	9.03(a)
MML Mid Cap Growth	38.46	39.78	32.25	30.70	29.09	25.99	19.24	17.11	17.53	13.85	9.56(a)
MML Mid Cap Value	39.99	46.51	42.13	34.59	35.52	30.81	23.90	20.72	21.10	17.78	12.29(a)
MML Moderate Allocation	15.59	16.69	14.90	14.11	14.37	13.77	11.85	10.59	10.61	9.46	10.00(c)
MML NASDAQ-100® (i)	—	—	—	—	—	—	—	5.19	5.09	4.31	4.72(a)
MML Short-Duration Bond	10.74	10.73	10.62	10.47	10.53	10.54	10.58	10.42	10.20	—	10.00(g)
MML Small Cap Equity	27.27	30.72	27.18	23.26	24.95	22.51	16.15	13.80	14.28	11.71	10.51(a)
MML Small Cap Growth Equity	21.75	23.14	19.07	17.11	18.24	17.43	11.88	10.60	11.32	9.36	8.03(a)
MML Small Cap Index (i)	—	—	—	—	—	—	—	14.85	14.94	12.04	9.89(a)
MML Small Company Value	25.14	29.31	26.62	20.38	21.86	22.06	17.00	14.96	15.37	12.90	10.00(e)
MML Small/Mid Cap Value	30.98	36.85	32.86	26.58	28.47	26.32	19.28	16.38	17.92	14.30	10.00(b)
MML Strategic Emerging Markets	13.25	15.34	11.60	11.06	13.07	14.01	15.20	13.27	17.32	15.01	10.00(e)
MML Total Return Bond	10.42	10.58	10.42	10.31	10.43	10.11	10.42	—	—	—	10.00(f)
MML U.S. Government Money Market	9.12	9.11	9.18	9.28	9.39	9.50	9.62	9.73	9.85	9.96	10.00(c)
Oppenheimer Capital Appreciation	14.47	15.53	12.39	12.82	12.53	10.98	8.57	7.59	7.77	7.19	8.28(a)
Oppenheimer Conservative Balanced (j)	13.95	14.91	13.81	13.27	13.32	12.46	11.14	10.03	10.08	9.03	10.11(a)
Oppenheimer Discovery Mid Cap Growth	9.61	10.36	8.14	8.05	7.64	7.30	5.44	4.72	4.73	3.75	8.08(a)
Oppenheimer Global	21.88	25.50	18.88	19.09	18.58	18.38	14.61	12.19	13.45	11.74	8.52(a)
Oppenheimer Global Multi-Alternatives (o)	9.12	9.55	9.64	9.43	9.92	—	—	—	—	—	10.00(h)
Oppenheimer Global Strategic Income	20.50	21.70	20.66	19.62	20.31	19.99	20.25	18.05	18.11	15.94	10.00(a)
Oppenheimer Government Money (m)	10.49	10.47	10.55	10.68	10.80	10.93	11.06	11.19	11.32	11.45	10.37(a)
Oppenheimer High Income (k), (l)	—	—	—	—	—	—	—	3.79	3.93	3.46	9.71(a)
Oppenheimer International Growth	13.82	17.36	13.91	14.38	14.06	15.34	12.33	10.21	11.13	9.81	7.53(a)
Oppenheimer Main Street	17.46	19.18	16.60	15.05	14.74	13.47	10.35	8.96	9.06	7.90	4.88(a)
Panorama Growth (t)	—	—	—	—	—	—	—	8.97	9.05	7.93	8.03(a)
Panorama Total Return (i)	—	—	—	—	—	—	—	9.13	9.22	7.99	8.89(a)
PIMCO CommodityRealReturn® Strategy	5.02	5.92	5.86	5.17	7.03	8.74	10.37	9.99	10.93	8.90	10.00(n)
VY® Clarion Global Real Estate	13.82	15.33	14.03	14.11	14.46	12.85	12.54	10.10	10.79	9.41	10.00(n)

Accumulation Units Outstanding

Sub-Account	Dec. 31, 2018	Dec. 31, 2017	Dec. 31, 2016	Dec. 31, 2015	Dec. 31, 2014	Dec. 31, 2013	Dec. 31, 2012	Dec. 31, 2011	Dec. 31, 2010	Dec. 31, 2009
Fidelity® VIP Contrafund® (a)	437,197	464,171	460,202	455,519	444,882	425,447	400,507	376,577	348,649	324,402

Sub-Account	Dec. 31, 2018	Dec. 31, 2017	Dec. 31, 2016	Dec. 31, 2015	Dec. 31, 2014	Dec. 31, 2013	Dec. 31, 2012	Dec. 31, 2011	Dec. 31, 2010	Dec. 31, 2009
Invesco V.I. Diversified Dividend (a)	90,897	79,894	63,455	26,270	24,624	23,289	24,660	13,646	8,060	11,072
Invesco V.I. Health Care (a)	64,404	67,343	67,388	71,711	61,466	58,191	54,436	50,627	47,155	41,365
Invesco V.I. Technology (a)	164,962	172,277	146,066	148,386	134,368	123,148	105,232	96,564	100,630	72,376
MML Aggressive Allocation (c)	321,987	286,140	209,600	137,915	99,624	85,085	81,484	76,546	47,775	33,116
MML Asset Allocation (b), (f)	—	—	—	—	—	—	—	140,412	144,601	161,494
MML Balanced Allocation (c)	287,497	301,191	278,042	257,377	211,779	187,270	119,449	103,276	89,108	64,607
MML Blend (a)	288,070	298,694	321,139	300,758	291,793	302,498	308,518	255,845	262,647	337,180
MML Blue Chip Growth (b)	99,890	103,386	96,565	88,913	74,256	69,643	62,296	46,609	43,503	41,863
MML China (d), (e)	—	—	—	—	—	1,705	1,959	1,584	776	207
MML Concentrated Growth (a), (i)	—	—	—	—	—	—	—	53,655	57,551	58,845
MML Conservative Allocation (c)	107,923	115,780	119,791	109,770	97,596	96,154	96,621	58,067	49,448	29,835
MML Core Allocation (e), *	201,708	168,824	119,309	69,808	48,832	34,689	27,869	19,022	10,727	1,317
MML Emerging Growth (a), (i)	—	—	—	—	—	—	—	29,926	28,713	23,331
MML Enhanced Index Core Equity (b), (i)	—	—	—	—	—	—	—	19,514	17,222	15,837
MML Equity (a)	189,343	201,875	215,566	271,144	263,422	258,932	259,271	250,560	254,425	256,563
MML Equity Income (b)	128,878	140,539	142,179	156,173	158,717	150,815	144,598	139,777	113,278	100,563
MML Equity Index (a)	88,760	91,091	87,931	84,899	71,355	74,851	69,073	65,938	67,576	69,449
MML Focused Equity (f)	9,134	8,481	5,460	5,518	4,308	2,054	—	—	—	—
MML Foreign (a)	136,164	136,770	142,327	148,260	150,623	147,065	144,602	141,632	136,405	126,573
MML Fundamental Growth (f)	6,856	6,527	6,957	5,119	7,068	4,071	—	—	—	—
MML Fundamental Value (f)	8,544	7,838	6,772	3,666	3,332	580	66	—	—	—
MML Global (a)	99,772	102,970	87,310	56,751	50,827	47,455	46,390	36,906	35,284	31,541
MML Growth (e), *	79,579	79,563	74,308	64,965	57,340	49,264	41,960	33,434	19,266	2,751
MML Growth & Income (b)	85,131	81,680	93,307	93,287	93,753	100,311	105,628	110,774	116,316	117,279
MML Growth Allocation (c)	514,623	513,769	447,405	357,956	329,575	317,235	301,354	258,228	210,792	163,813
MML High Yield (g)	48,512	41,285	31,748	21,028	18,484	11,353	11,915	2,741	9	—
MML Income & Growth (a)	67,795	74,755	78,605	78,720	79,346	82,051	86,800	91,544	104,900	112,495
MML Inflation-Protected and Income (b)	136,841	151,927	147,928	151,623	151,152	145,283	144,434	127,997	125,913	103,987
MML International (e), *	80,389	71,824	69,174	64,339	57,393	48,836	38,278	31,439	22,136	6,076
MML International Equity (h)	7,529	6,306	2,993	788	345	—	—	—	—	—
MML Large Cap Growth (a)	80,769	82,281	80,932	81,750	78,563	85,936	88,176	80,757	78,684	79,441
MML Managed Bond (a)	145,062	178,575	173,214	182,095	189,133	185,290	214,593	219,779	216,624	216,487
MML Managed Volatility (a)	110,658	115,099	114,369	118,710	127,087	123,762	122,844	116,838	109,532	94,061
MML Mid Cap Growth (a)	188,671	203,815	199,943	198,245	195,259	196,315	200,834	196,410	195,504	192,773

Sub-Account	Dec. 31, 2018	Dec. 31, 2017	Dec. 31, 2016	Dec. 31, 2015	Dec. 31, 2014	Dec. 31, 2013	Dec. 31, 2012	Dec. 31, 2011	Dec. 31, 2010	Dec. 31, 2009
MML Mid Cap Value (a)	96,678	106,704	101,646	100,127	102,017	110,570	112,595	115,057	121,017	118,088
MML Moderate Allocation (c)	606,463	576,846	542,114	477,323	393,009	333,533	264,621	212,690	162,276	86,189
MML NASDAQ-100 [®] (a), (i)	—	—	—	—	—	—	—	79,264	62,976	36,310
MML Short-Duration Bond (g)	16,837	21,439	23,142	7,453	5,702	5,199	4,811	2,703	1,651	—
MML Small Cap Equity (a)	62,625	62,705	66,955	68,357	65,683	65,310	70,677	55,553	61,303	56,788
MML Small Cap Growth Equity (a)	44,000	42,311	43,164	47,443	43,672	44,303	42,242	46,733	46,590	41,996
MML Small Cap Index (a), (i)	—	—	—	—	—	—	—	76,380	78,455	70,898
MML Small Company Value (e)	26,231	25,076	20,180	18,267	16,741	11,623	6,957	3,550	3,460	2,556
MML Small/Mid Cap Value (b)	62,276	68,294	67,917	70,166	67,220	67,147	62,876	61,807	58,597	55,003
MML Strategic Emerging Markets (e)	29,781	28,436	26,779	22,922	19,531	15,061	9,557	6,090	3,499	1,099
MML Total Return Bond (f)	36,510	31,913	30,066	24,594	20,979	9,534	2,629	—	—	—
MML U.S. Government Money Market (c)	386,002	393,657	464,441	424,694	415,840	421,503	370,615	69,285	43,976	33,282
Oppenheimer Capital Appreciation (a)	159,733	166,410	167,588	176,832	172,467	181,876	192,109	202,695	240,778	251,980
Oppenheimer Conservative Balanced (a), (j)	19,381	26,052	27,375	27,852	29,766	30,024	32,645	37,900	42,007	48,430
Oppenheimer Discovery Mid Cap Growth (a)	316,768	340,875	371,314	379,228	384,594	388,764	382,079	363,725	375,588	389,814
Oppenheimer Global (a)	298,263	321,946	327,345	336,337	338,907	345,109	351,762	358,638	371,356	387,479
Oppenheimer Global Multi-Alternatives (h), (o)	2,043	4,114	3,188	2,674	2,577	—	—	—	—	—
Oppenheimer Global Strategic Income (a)	135,689	152,633	161,062	180,030	186,935	187,284	179,614	168,694	177,515	168,682
Oppenheimer Government Money (a), (m)	30,971	37,809	28,848	67,475	74,019	70,131	74,521	76,537	99,780	119,143
Oppenheimer High Income (a), (k), (l)	—	—	—	—	—	—	—	50,503	62,414	73,996
Oppenheimer International Growth (a)	133,487	134,837	135,701	128,336	121,530	110,746	111,255	112,309	107,033	97,061
Oppenheimer Main Street (a)	136,275	143,587	141,777	142,463	138,787	137,220	142,765	132,490	132,383	130,878
Panorama Growth (a), (i)	—	—	—	—	—	—	—	18,503	18,655	17,371
Panorama Total Return (a), (i)	—	—	—	—	—	—	—	9,923	7,940	7,358
PIMCO CommodityRealReturn [®] Strategy (n)	73,607	77,051	70,028	65,354	55,371	46,318	40,955	35,406	26,584	24,424
VY [®] Clarion Global Real Estate (n)	40,022	46,099	44,242	44,445	35,733	26,622	21,876	21,319	18,903	16,805

Notes to Condensed Financial Information

- a) Commencement of public offering was June 29, 2001.
- b) Commencement of public offering was May 1, 2003.
- c) Commencement of public offering was January 19, 2008.
- d) Effective April 28, 2014, MML China merged into MML Foreign.
- e) Commencement of public offering was May 1, 2009.
- f) Commencement of public offering was May 1, 2012.
- g) Commencement of public offering was May 1, 2010.

- h) *Commencement of public offering was May 1, 2014.*
- i) *Beginning April 30, 2012, this sub-account is unavailable as an investment choice.*
- j) *This sub-account is unavailable in certificates issued on or after April 30, 2012.*
- k) *Unavailable in certificates issued on or after May 1, 2009. For certificates issued prior to May 1, 2009, you may not allocate any new money to this sub-account via purchase payments or transfers.*
- l) *Effective October 26, 2012, Oppenheimer High Income was merged into Oppenheimer Global Strategic Income.*
- m) *This sub-account is unavailable in certificates issued on or after January 19, 2008.*
- n) *Commencement of public offering was May 1, 2006.*
- o) *Effective April 29, 2019, the corresponding fund was liquidated and is no longer available as an investment choice.*
- * *Individual Sub-Account Footnotes:*
 - MML Core Allocation sub-account invests in MML American Funds Core Allocation Fund.*
 - MML Growth sub-account invests in MML American Funds® Growth Fund.*
 - MML International sub-account invests in MML American Funds® International Fund.*

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