

MetLife, Inc.

Notes to the Consolidated Financial Statements — (Continued)

Option-based. — Valuations are based on option pricing models, which utilize significant inputs that may include the swap yield curve, spot equity index levels, dividend yield curves and equity volatility.

Level 3 Valuation Techniques and Key Inputs:

These derivatives are principally valued using the income approach. Valuations of non-option-based derivatives utilize present value techniques, whereas valuations of option-based derivatives utilize option pricing models. These valuation methodologies generally use the same inputs as described in the corresponding sections above for Level 2 measurements of derivatives. However, these derivatives result in Level 3 classification because one or more of the significant inputs are not observable in the market or cannot be derived principally from, or corroborated by, observable market data.

Interest rate

Non-option-based. — Significant unobservable inputs may include pull through rates on interest rate lock commitments and the extrapolation beyond observable limits of the swap yield curve and LIBOR basis curves.

Option-based. — Significant unobservable inputs may include the extrapolation beyond observable limits of the swap yield curve, LIBOR basis curves and interest rate volatility.

Foreign currency exchange rate

Non-option-based. — Significant unobservable inputs may include the extrapolation beyond observable limits of the swap yield curve, LIBOR basis curves, cross currency basis curves and currency correlation.

Option-based. — Significant unobservable inputs may include currency correlation and the extrapolation beyond observable limits of the swap yield curve, LIBOR basis curves, cross currency basis curves and currency volatility.

Credit

Non-option-based. — Significant unobservable inputs may include credit spreads, repurchase rates and the extrapolation beyond observable limits of the swap yield curve and credit curves. Certain of these derivatives are valued based on independent non-binding broker quotations.

Equity market

Non-option-based. — Significant unobservable inputs may include the extrapolation beyond observable limits of dividend yield curves and equity volatility.

Option-based. — Significant unobservable inputs may include the extrapolation beyond observable limits of dividend yield curves, equity volatility and unobservable correlation between model inputs.

Embedded Derivatives

Embedded derivatives principally include certain direct, assumed and ceded variable annuity guarantees and equity or bond indexed crediting rates within certain funding agreements. Embedded derivatives are recorded at estimated fair value with changes in estimated fair value reported in net income.

The fair value of these embedded derivatives, estimated as the present value of projected future benefits minus the present value of projected future fees using actuarial and capital market assumptions including expectations concerning policyholder behavior, is calculated by the Company's actuarial department. The calculation is based on in-force business, and is performed using standard actuarial valuation software which projects future cash flows from the embedded derivative over multiple risk neutral stochastic scenarios using observable risk free rates.

Capital market assumptions, such as risk free rates and implied volatilities, are based on market prices for publicly traded instruments to the extent that prices for such instruments are observable. Implied volatilities beyond the observable period are extrapolated based on observable implied volatilities and historical volatilities. Actuarial assumptions, including mortality, lapse, withdrawal and utilization, are unobservable and are reviewed at least annually based on actuarial studies of historical experience.

The valuation of these guarantee liabilities includes nonperformance risk adjustments and adjustments for a risk margin related to non-capital market inputs. The nonperformance adjustment is determined by taking into consideration publicly available information relating to spreads in the secondary market for MetLife, Inc.'s debt, including related credit default swaps. These observable spreads are then adjusted, as necessary, to reflect the priority of these liabilities and the claims paying ability of the issuing insurance subsidiaries compared to MetLife, Inc.

Risk margins are established to capture the non-capital market risks of the instrument which represent the additional compensation a market participant would require to assume the risks related to the uncertainties of such actuarial assumptions as annuitization, premium persistency, partial withdrawal and surrenders. The establishment of risk margins requires the use of significant management judgment, including assumptions of the amount and cost of capital needed to cover the guarantees. These guarantees may be more costly than expected in volatile or declining equity markets. Market conditions including, but not limited to, changes in interest rates, equity indices, market volatility and foreign currency exchange rates; changes in nonperformance risk; and variations in actuarial assumptions regarding policyholder behavior, mortality and risk margins related to non-capital market inputs, may result in significant fluctuations in the estimated fair value of the guarantees that could materially affect net income.

The Company ceded the risk associated with certain of the GMIBs and GMABs previously described. These reinsurance agreements contain embedded derivatives which are included within premiums, reinsurance and other receivables in the consolidated balance sheets with changes in estimated fair value reported in net derivative gains (losses) or policyholder benefits and claims depending on the statement of operations classification of the direct risk. The value of the embedded derivatives on the ceded risk is determined using a methodology consistent with that described previously for the guarantees directly written by the Company with the exception of the input for nonperformance risk that reflects the credit of the reinsurer.

The estimated fair value of the embedded derivatives within funds withheld related to certain ceded reinsurance is determined based on the change in estimated fair value of the underlying assets held by the Company in a reference portfolio backing the funds withheld liability. The estimated fair value of the underlying assets is determined as previously described in "— Investments — Securities, Short-term Investments, Other Investments, Long-term Debt of CSEs and Trading Liabilities." The estimated fair value of these embedded derivatives is included, along with their funds withheld hosts, in other liabilities in the consolidated balance sheets with changes in estimated fair value recorded in net derivative gains (losses). Changes in the credit spreads