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# *Milliman Academy Workshop: New Financial Regulations for Insurance and Takaful Companies in UAE*

*Investment Risk and Asset Valuation Considerations*

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- Key elements of the regulation focus on reducing risk in the asset portfolio
- Risk management
  - Investment committee
  - Asset portfolio construction
  - Scenario and stress testing
- Asset valuation

# Investment committee

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- Developing a sound investment policy and ensuring that it is implemented efficiently and effectively
- Investment policy
  - Asset allocation guidelines and return objectives
  - Key risks and risk tolerances
  - Strategies for risk mitigation
- Implementation
  - Actual policy execution performed by teams outside of the committee
  - Implementation monitored through regular review by committee

# Diversification and concentration limits

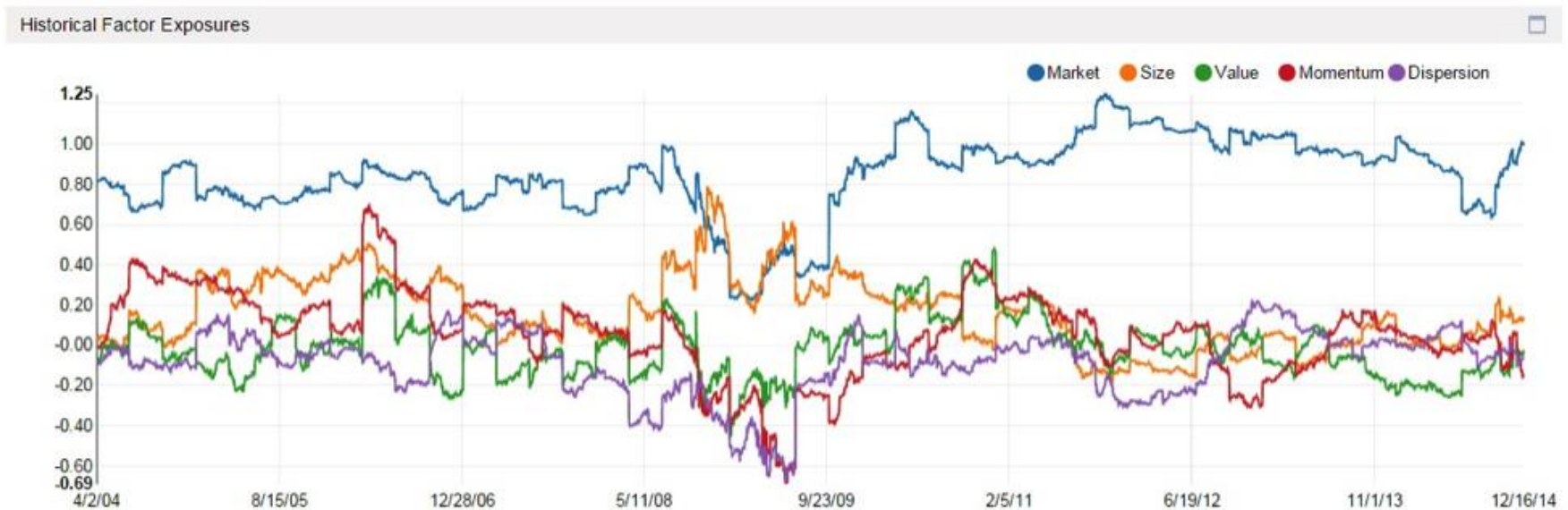
Type of Invested Asset	Maximum Limit for aggregate exposure in a particular asset class	Sub-limit for exposure to a single counter-party
Real Estate	30%	No Sub Limit
Equity instruments in listed and not listed companies within UAE.	30%	10%
Equity instruments issued by companies listed and not listed outside UAE.	20%	10%
Government securities/instruments issued by the UAE and/or by one of the Emirates in the UAE.	100%	25%
Government securities/instruments issued by (A) rated countries.	80%	25%
Cash and deposits with Banks in the UAE (e.g. current account, demand deposits, term deposits, notice deposits, certificates of deposit, etc.)	Minimum 5%	50%
Loans secured by life policies (excluding unit-linked funds' related policies) issued by the Company.	30%	No Sub Limit
Derivatives or complex financial instruments to be used for hedging purposes only.	1%	No Sub Limit
Secured loans, deposits with non-banks, debentures, bonds & other debt instruments which are rated strong or very strong by reputed and independent rating agency.	30%	20%
Other Invested Assets	10%	No Sub Limit

- Diversification and concentration
- Credit risk
- Liquidity risk
- Market risk (market values)

*These form the basis of risk budgeting or risk scoring  
to assess the company's risk appetite*

# Asset portfolio exposures

- Main exposures by region, industry, issuer, credit, etc.
- Baseline exposures versus stressed exposures
- Need to consider exposures to other factors (inflation, momentum, growth, etc.)



# Credit risk exposure

- Stress testing counterparty exposure
  
- Changes in credit ratings
  - Credit transition matrices applied to fixed asset holdings
  - Resulting exposures and credit spreads used to determine changes in market value
  
- Default modeling
  - Look at rating category and issue year
  - Incorporate expected recovery

Initial Rating	Rating at Year-End								
	Aaa	Aa	A	Baa	Ba	B	Caa	Ca-C	Default
Aaa	99.16	0.82	0.02	0.00	0.00	0.00	0.00	0.00	0.00
Aa	0.09	99.12	0.77	0.01	0.00	0.00	0.00	0.00	0.00
A	0.00	0.26	99.18	0.51	0.04	0.01	0.00	0.00	0.00
Baa	0.00	0.01	0.44	99.05	0.41	0.06	0.02	0.00	0.01
Ba	0.00	0.00	0.02	0.59	98.46	0.79	0.03	0.01	0.09
B	0.00	0.00	0.01	0.02	0.53	98.32	0.70	0.07	0.36
Caa	0.00	0.00	0.00	0.01	0.02	1.01	96.79	0.67	1.48
Ca-C	0.00	0.00	0.00	0.00	0.04	0.28	1.53	93.23	4.92
Default	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00



# Liquidity risk exposure

- Stress testing asset and liability cash flows
- Typically project asset and liability cash flows
  - Monthly or quarterly projection over 1 to 3 years
  - Test exposure through stochastic scenarios to examine tail risks

Stochastic Cash Flow Report													
Date	Feb 28, 2015												
	Mar 2015	Apr 2015	May 2015	Jun 2015	Jul 2015	Aug 2015	Sep 2015	Oct 2015	Nov 2015	Dec 2015	Jan 2016	Feb 2016	Total
<b>90th Percentile</b>													
Liabilities	7,142	(9,999)	61,275	49,761	43,518	52,699	51,423	86,633	85,912	66,036	46,499	77,331	<b>618,230</b>
Assets	4,198	31,583	8,379	1,560	3,160	1,302	1,255	24,647	10,388	5,690	2,803	19,777	<b>114,742</b>
	<b>(2,944)</b>	<b>41,582</b>	<b>(52,896)</b>	<b>(48,201)</b>	<b>(40,358)</b>	<b>(51,397)</b>	<b>(50,169)</b>	<b>(61,986)</b>	<b>(75,524)</b>	<b>(60,346)</b>	<b>(43,696)</b>	<b>(57,554)</b>	<b>(503,488)</b>
<b>95th Percentile</b>													
Liabilities	1,631	(9,999)	60,672	88,067	93,092	58,752	57,723	43,807	74,792	56,813	46,122	50,671	<b>622,144</b>
Assets	1,443	13,964	8,078	19,153	24,787	3,027	4,405	3,235	4,828	1,079	2,615	6,447	<b>93,059</b>
	<b>(188)</b>	<b>23,963</b>	<b>(52,594)</b>	<b>(68,914)</b>	<b>(68,305)</b>	<b>(55,726)</b>	<b>(53,318)</b>	<b>(40,573)</b>	<b>(69,964)</b>	<b>(55,734)</b>	<b>(43,507)</b>	<b>(44,225)</b>	<b>(529,085)</b>
<b>99th Percentile</b>													
Liabilities	2,897	(9,999)	67,478	87,793	60,398	82,476	58,332	96,343	92,286	57,213	40,893	76,682	<b>712,792</b>
Assets	2,076	24,792	11,481	19,016	8,440	14,888	4,709	29,502	13,575	1,279	4,338	19,452	<b>153,549</b>
	<b>(822)</b>	<b>34,791</b>	<b>(55,997)</b>	<b>(68,777)</b>	<b>(51,958)</b>	<b>(67,588)</b>	<b>(53,623)</b>	<b>(66,840)</b>	<b>(78,711)</b>	<b>(55,934)</b>	<b>(36,554)</b>	<b>(57,230)</b>	<b>(559,243)</b>

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## Market risk exposure

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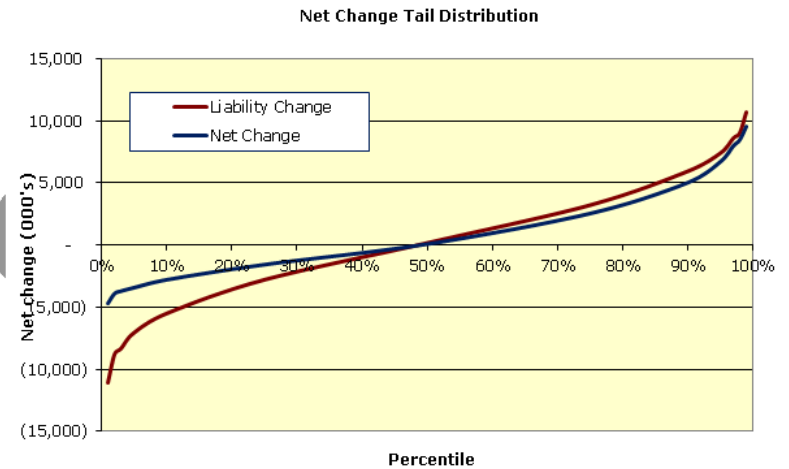
- Changes in asset values due to stressed market conditions
  - Equity market
  - Interest rates
  - Real estate
- Evaluated using stochastic scenarios and stress tests
- Stochastic scenarios derived using real world economic scenario generators incorporating both equity and interest rate movements
- Real estate stresses based on real estate indices for more developed markets adjusted for characteristics of the local market

# Risk exposure report

## Value-at-Risk Projections

	Percentile scenarios		Stress scenarios	
	5 Percentile	1 Percentile	Backtest 1	Backtest 2
<b>Index changes</b>				
SPX	-2.40%	-4.12%	-53.50%	-56.10%
EWZ	-2.97%	-5.43%	-53.50%	-56.10%
TPX	-3.70%	-4.61%	-53.50%	-56.10%
HSCEI	-7.09%	-10.95%	-53.50%	-56.10%
TWY	-2.55%	-3.26%	-53.50%	-56.10%
KOSPI2	-2.85%	-4.56%	-53.50%	-56.10%
NIFTY	-3.49%	-4.97%	-53.50%	-56.10%
SX5E	-3.02%	-4.95%	-53.50%	-56.10%
UKX	-2.98%	-4.29%	-53.50%	-56.10%
EEM	-4.37%	-6.29%	-53.50%	-56.10%
<b>Asset changes</b>				
Fund 1	(1,835)	(3,396)	(93,371)	(102,781)
Fund 2	(1,833)	(3,028)	(93,265)	(91,636)
	<b>(3,668)</b>	<b>(6,424)</b>	<b>(186,636)</b>	<b>(194,416)</b>
<b>Liability changes</b>				
North America	(4,124)	(7,454)	(5,795)	(6,076)
Europe	(2,073)	(2,406)	(198,751)	(208,839)
Other	(856)	(1,216)	-	-
	<b>(7,054)</b>	<b>(11,077)</b>	<b>(204,546)</b>	<b>(214,915)</b>
<b>Net Change</b>	<b>(3,386)</b>	<b>(4,652)</b>	<b>(17,910)</b>	<b>(20,499)</b>

## Tail distribution



- Mark-to-market
  - More prudent side of bid/offer
  
- Mark-to-model
  - Subject to all model development best practices (assumptions, design, testing, etc.)
  - Validation by the actuary
  
- Real estate
  - Independent valuations by real estate firms (Admissible Assets)
  - Discounted cash flow (Solvency Margin)

## Regular report to regulator

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- Market exposures and concentration of the asset portfolio
- Exposures to key risks (base and stress testing)
  - Credit risk
  - Liquidity risk
  - Market value risk
- Methodology used for calculating the base market values and stressed market values
- Methodology and calculations to be approved by the actuary

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