

Are you prepared to assume the risk of increasing EUR Yields?

Conference on the Negative Euro Area Interest Rates and Spillovers on
Western Balkan Central Bank's Policies and Instruments
Bank of Albania/IMF - Tirana May 4 – 5, 2017



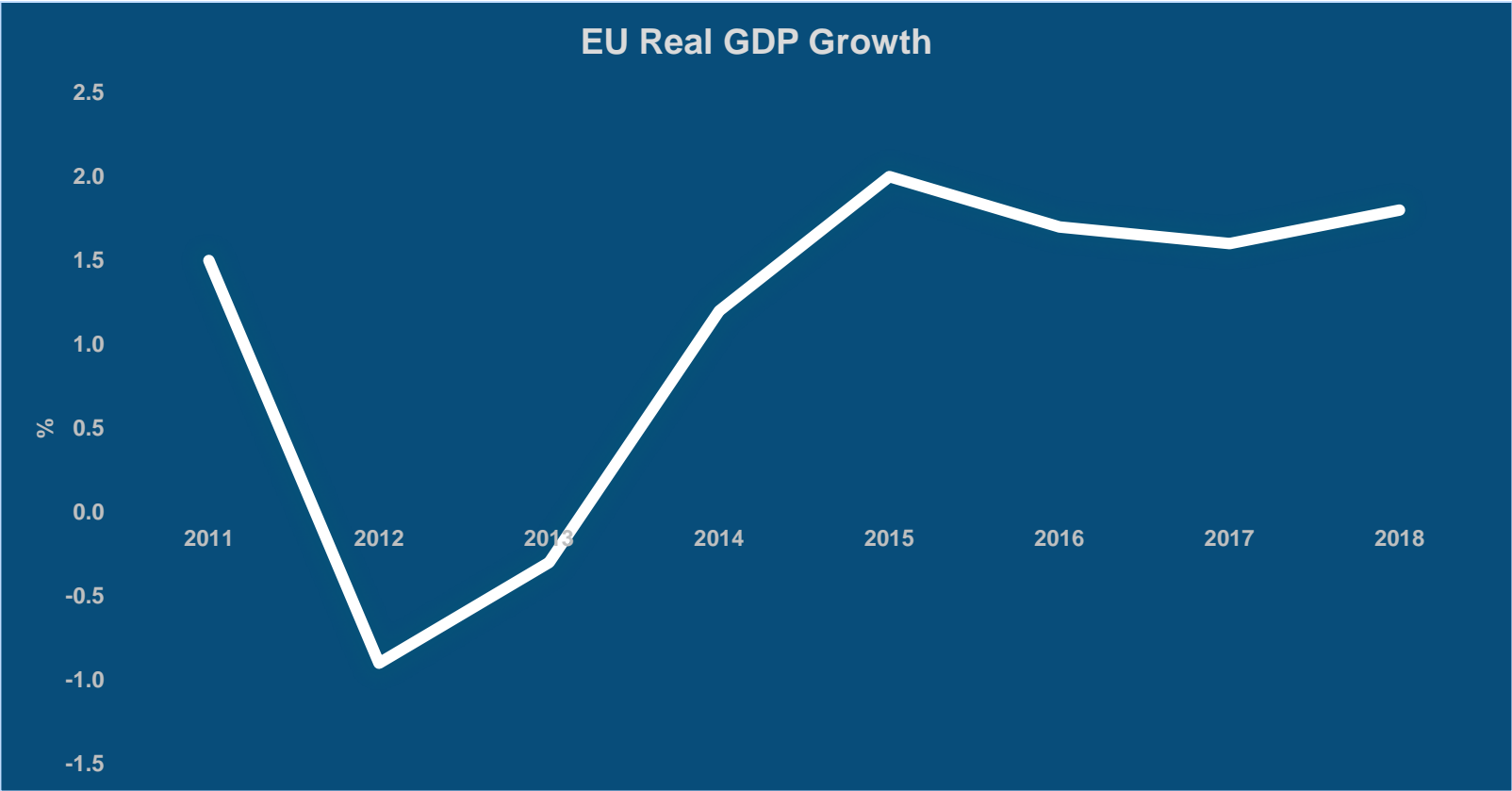
THE WORLD BANK

Treasury

Is the increase in EUR yields near?

EU Growth expectations are brighter

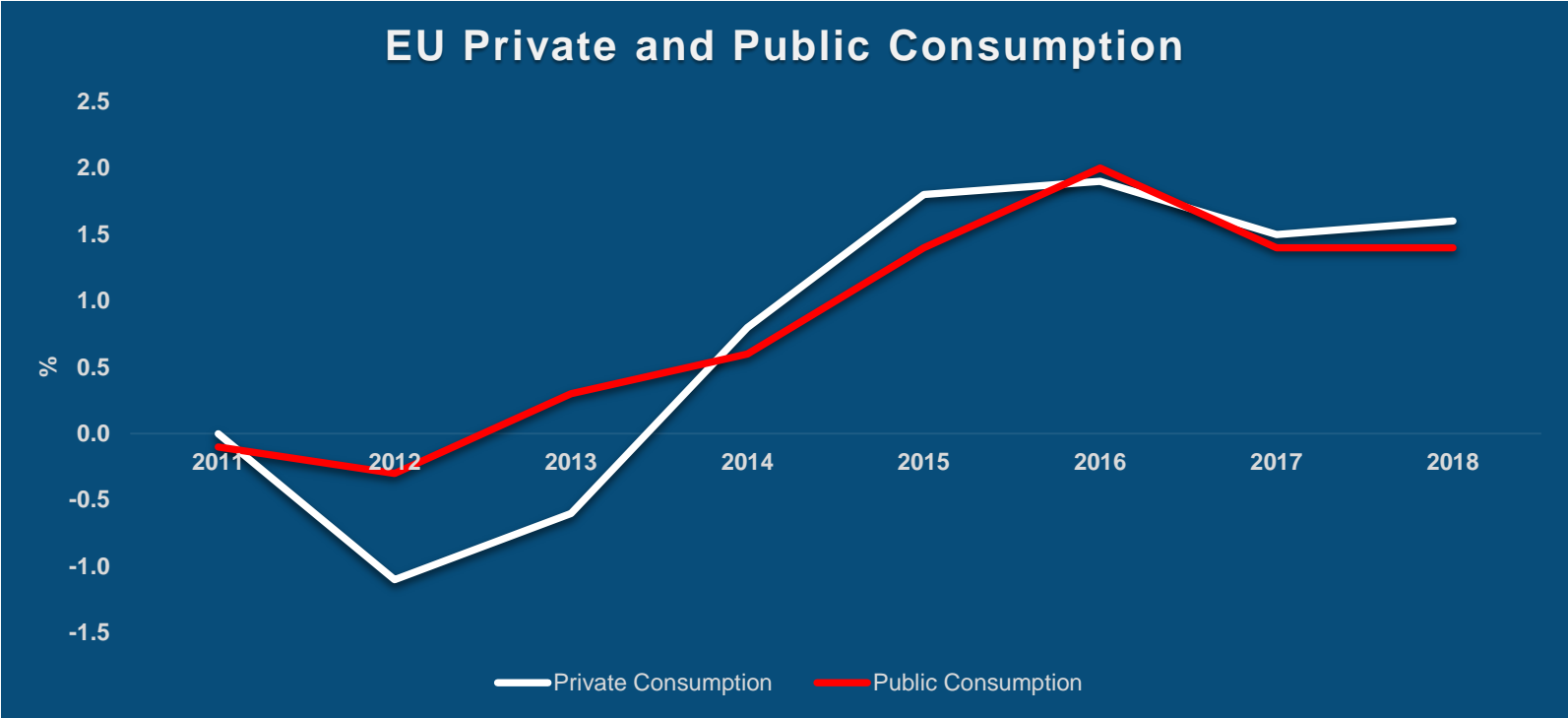
For the first time in almost a decade, the economies of the EU member states without exception are expected to grow, bar any political surprise.



European Commission: EU Economic Forecast Winter 2017

Private consumption has been the engine of the recovery

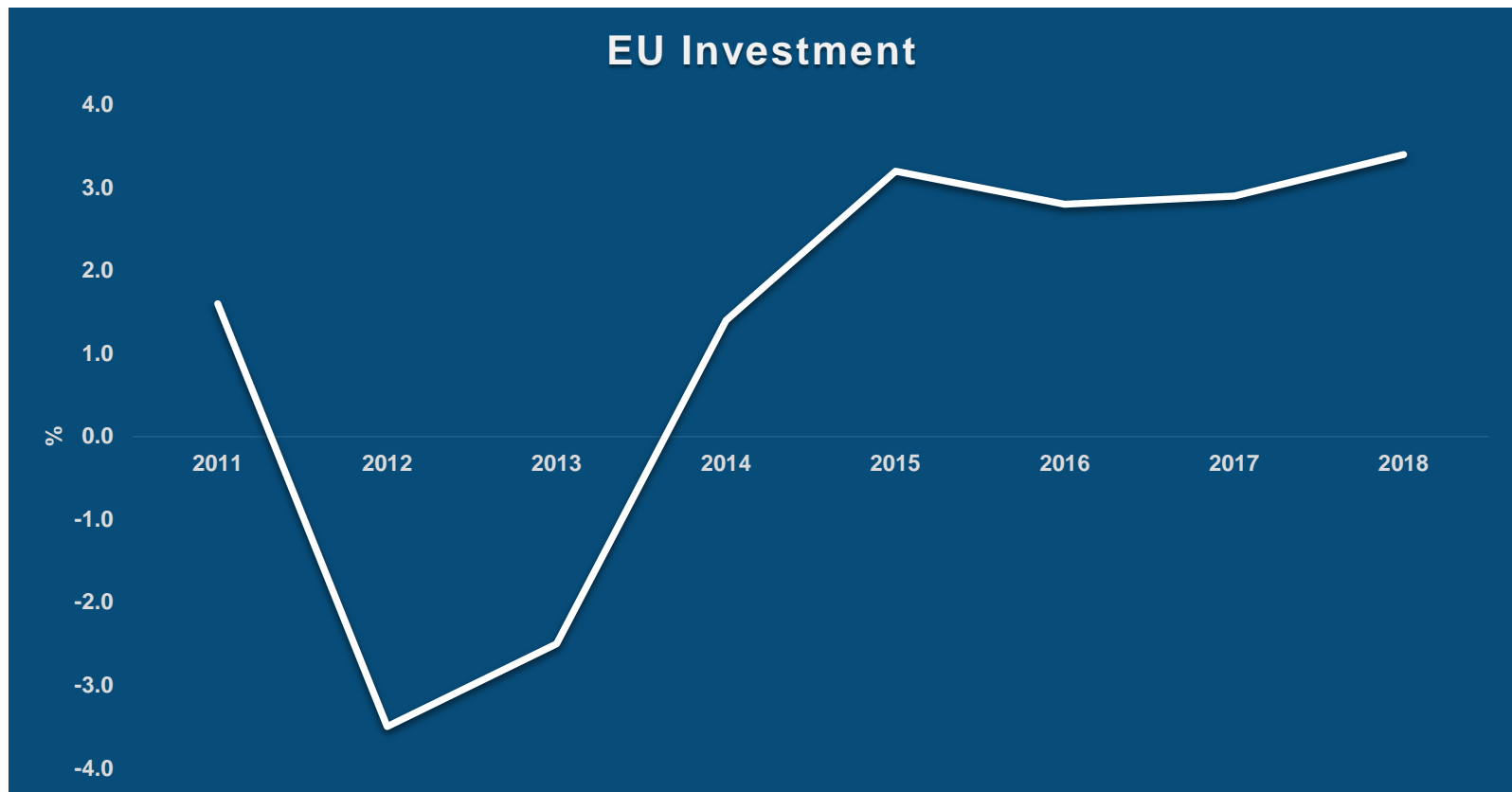
Private consumption has been underpinned by employment growth and increases in compensation, while public consumption is expected to provide stable support.



European Commission: EU Economic Forecast Winter 2017

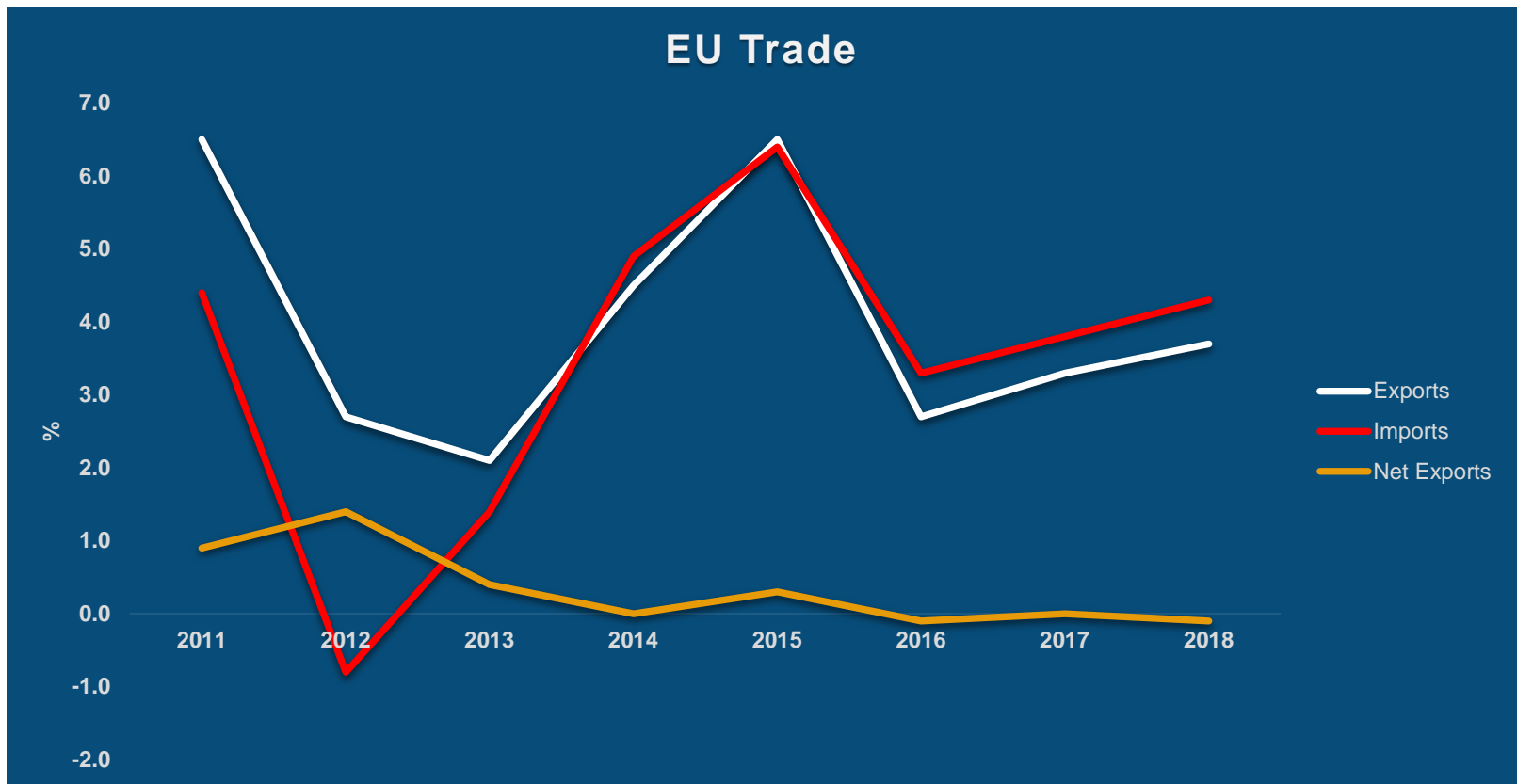
Investment growth has recovered, but remains subdued

Investment remains low despite substantial policy support and the improvement in financing conditions given the political uncertainty with approaching elections, Brexit and corporate deleveraging.



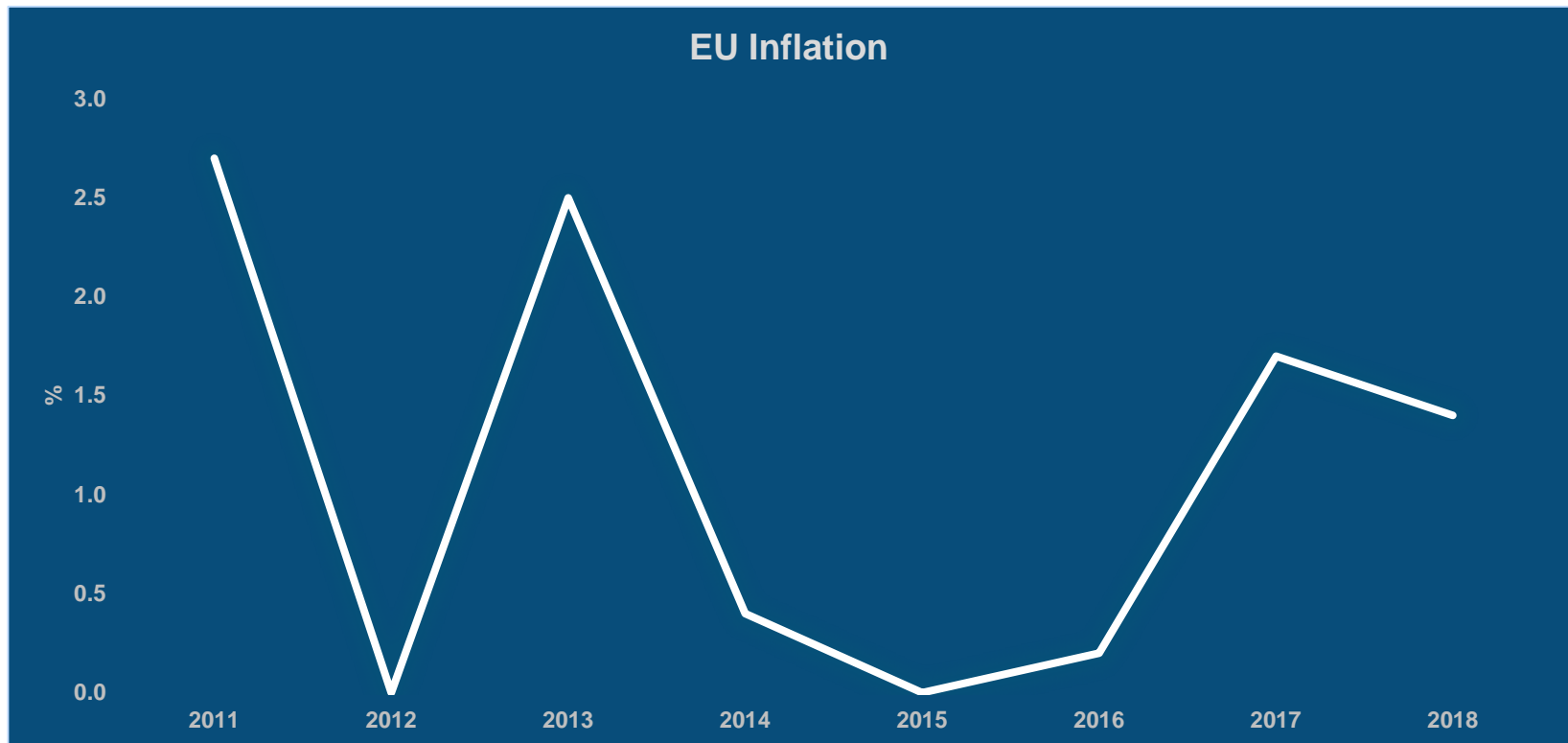
The contribution of net exports to growth is expected to be neutral

Exports are supported by the recovery in global demand, particularly in the US and in emerging markets, but imports are likely to grow at the same pace.



Inflation has increased, but below the 2% ECB Target

Headline inflation has increased propelled by the rebound in energy prices. Swap rates at the three year forward three year ahead horizon price an average inflation of 1.4%.

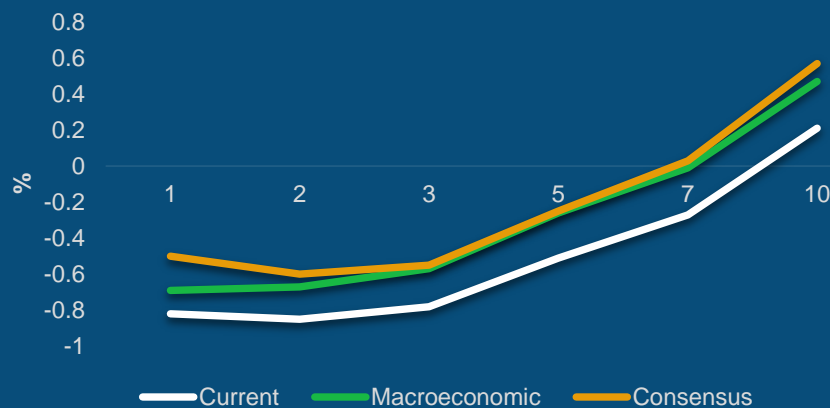


European Commission: EU Economic Forecast Winter 2017

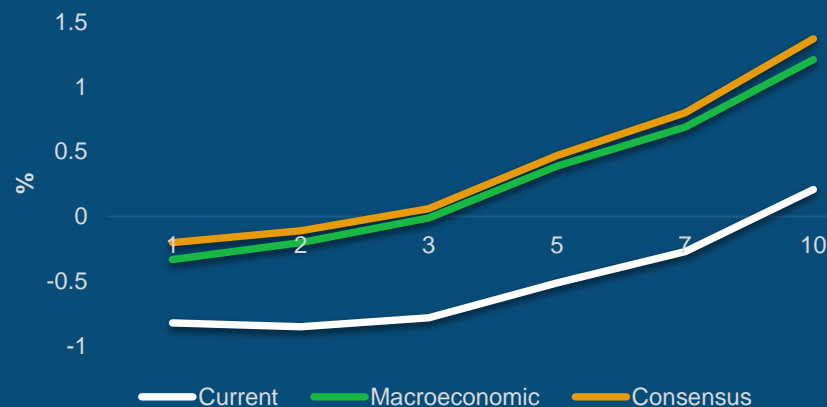
Market consensus tilts toward higher yields going forward.

The market consensus expects that, barring any political surprise, the gradual recovery will induce the ECB to announce in Q4 the end of its QE tapering plan for 2018.

Expected Changes in German Government Yield Curve over a One Year Horizon



Expected Changes in German Government Yield Curve over a Three Year Horizon



Macroeconomic scenario based on Oxford Economics
Market Consensus based on Bloomberg

Do you have enough reserves?

Western Balkans FX Regimes and EU Membership Status

Country	FX Regime	EU Membership Status
Albania	Float	Candidate
Serbia	Float	Candidate
FYR Macedonia	Managed Arrangement	Candidate
Croatia	Managed Arrangement	Joined the EU July 2013
Bosnia and Herzegovina	Currency Board	Potential Candidate
Montenegro	EUR	Candidate
Kosovo	EUR	Potential Candidate

Assessment of Reserve Adequacy Indicators

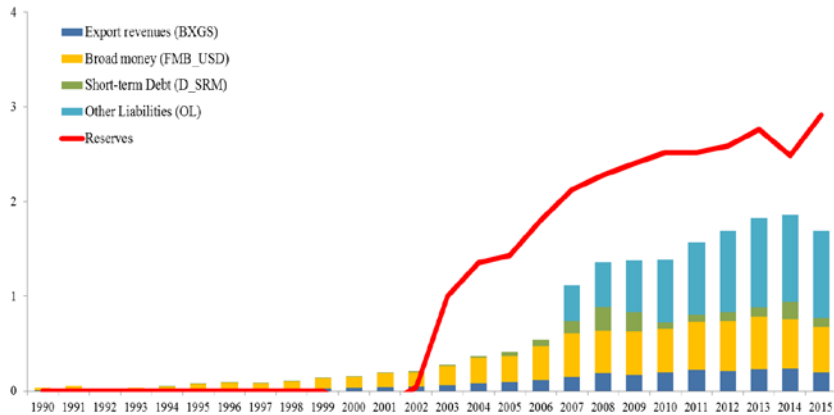
- Exports : To hedge the risk of a potential loss of export income as a result of a drop in external demand or a terms of trade shock.
- Short term debt: To hedge rollover risk.
- Other liabilities: To hedge the risk on non-resident outflows as a result of the liquidation of domestic equity and MLT debt holdings.
- Broad Money: To hedge the risk of resident capital flight.

ARA Weights				
FX Regime	Exports	STD	Other Liabilities	Broad Money
Fixed Rate	10	30	20	10
Floating rate	5	30	15	5

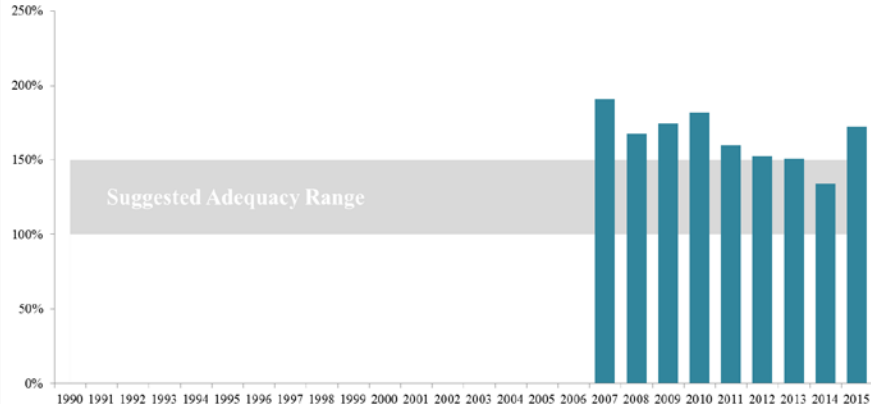
IMF ARA Data Base

Reserve Adequacy in the Western Balkan Region

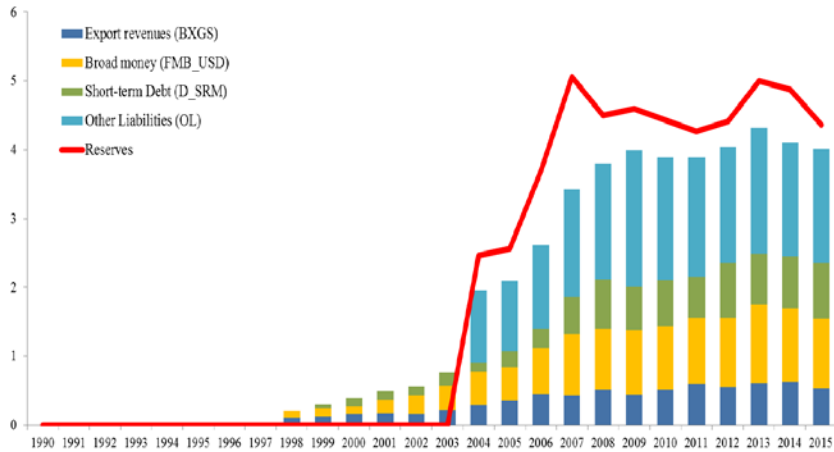
ARA Metric Decomposition: Albania



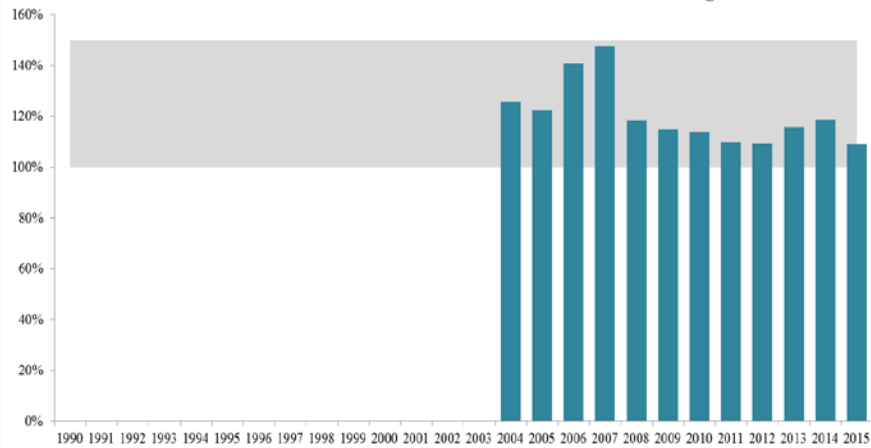
Reserves as Percent of Metric: Albania



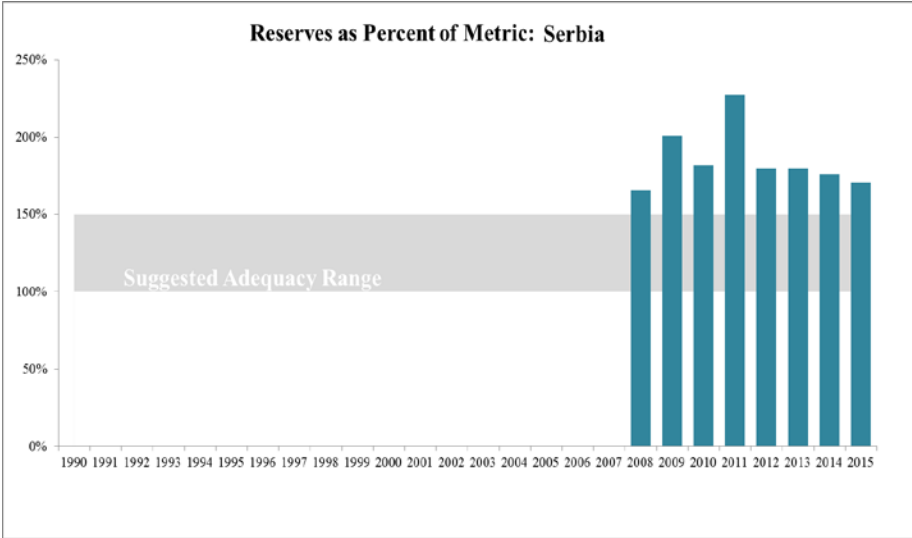
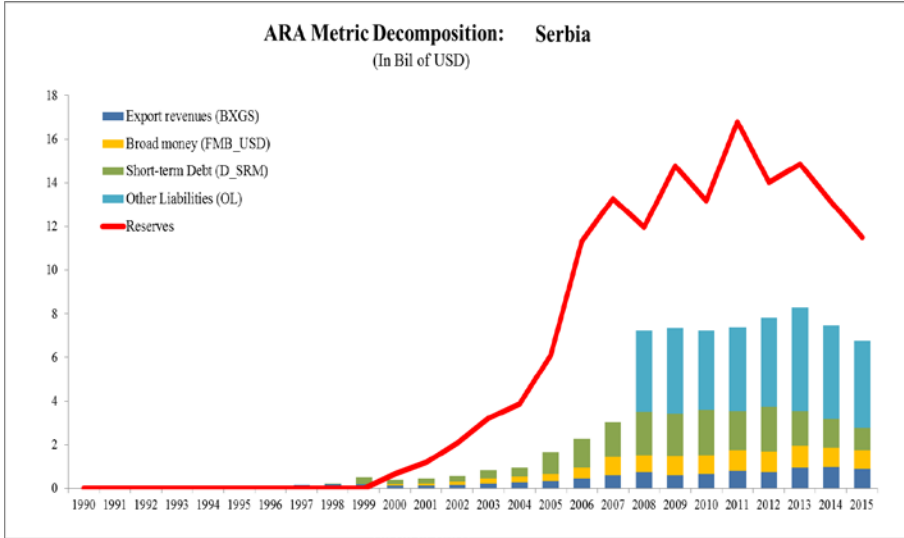
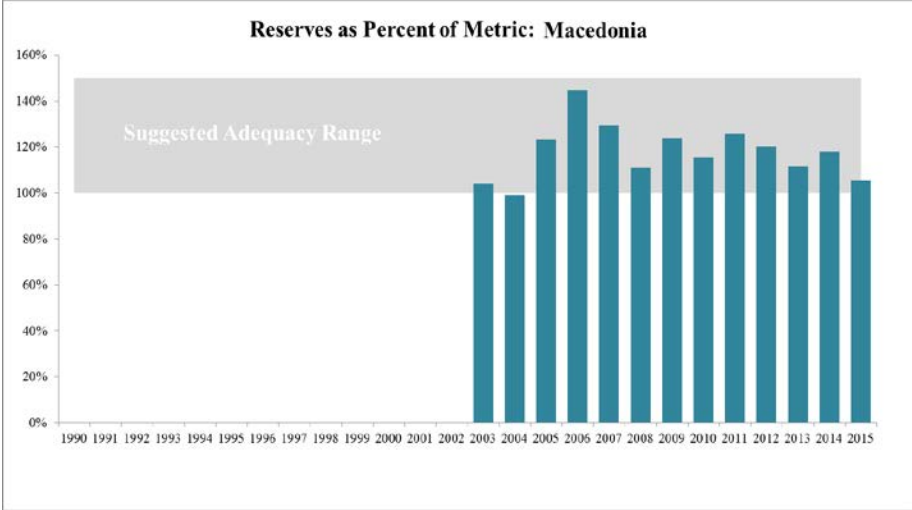
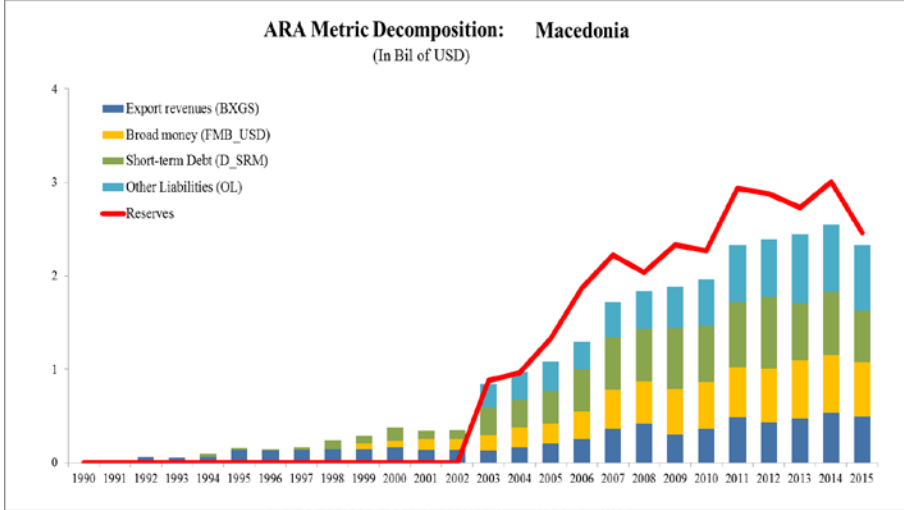
ARA Metric Decomposition: Bosnia and Herzegovina
(In Bil of USD)



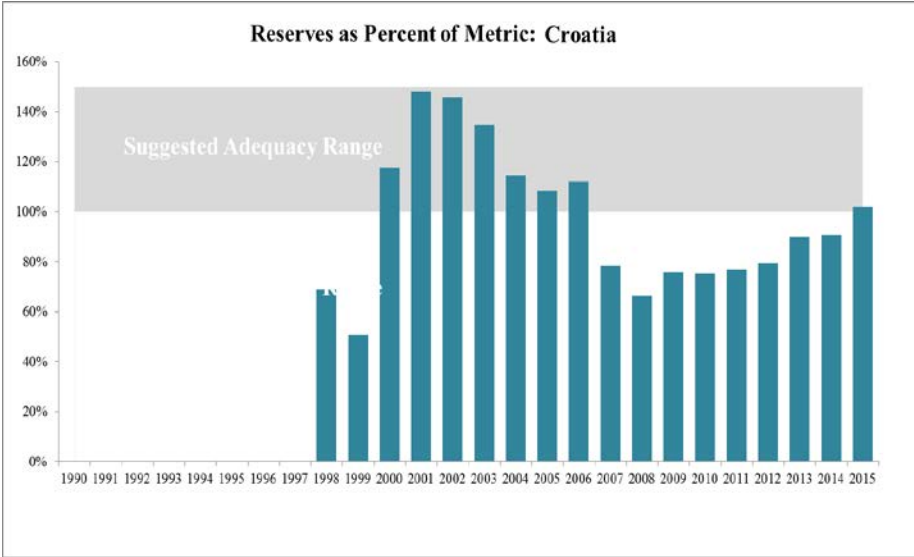
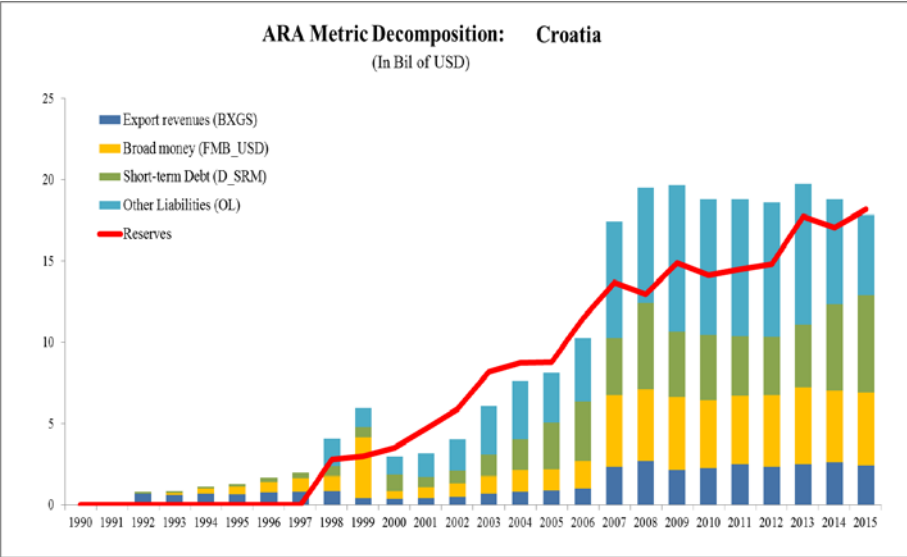
Reserves as Percent of Metric: Bosnia and Herzegovina



Reserve Adequacy in the Western Balkan Region



Reserve Adequacy in the Western Balkan Region



IMF ARA Data Base

Reserve Adequacy is important in defining the risk tolerance for the management of the foreign exchange reserves.

- In countries with flexible exchange rates, accumulating reserves within an adequate range is necessary to preserve the credibility of monetary policy, but the tolerance to liquidity and market risk is usually higher as intervention is designed to smoothen excessive exchange rate volatility.
- In countries with managed currency arrangements, the tolerance to liquidity and market risk is generally lower.
- The insurance motive for holding reserves to manage fat tail events, e.g disruptions in the international markets and political events, affects both.

The impact of reserve adequacy metrics on the tranching structure of the portfolio and its risk tolerance.

The analysis of the specific vulnerabilities of each country may lead to a more efficient specification of the criteria to set the tranching structure of the portfolio. For example:

Portfolio Structure and Risk Tolerance

Tranche	Criteria	Risk tolerance
Working Capital	Expected transactional needs and worst case potential intervention over a one month investment horizon.	High liquidity and low risk over a one month investment horizon.
Liquidity	Target weight estimated to cover rollover risk + non-resident investment outflows+ potential loss of export income – Working Capital.	High liquidity and low risk over a one year investment horizon.
Investment	Excess over the Liquidity tranche to cover resident capital flight.	Moderate Liquidity and low risk over an investment horizon longer than one year, but with high short term risk

The differentiation in the risk tolerance of a Liquidity and Investment Tranche is not always obvious

- Can the central bank tolerate the short term risk of an Investment Tranche invested over a longer investment horizon?

Minimum VaR Return with a 95% Confidence Level

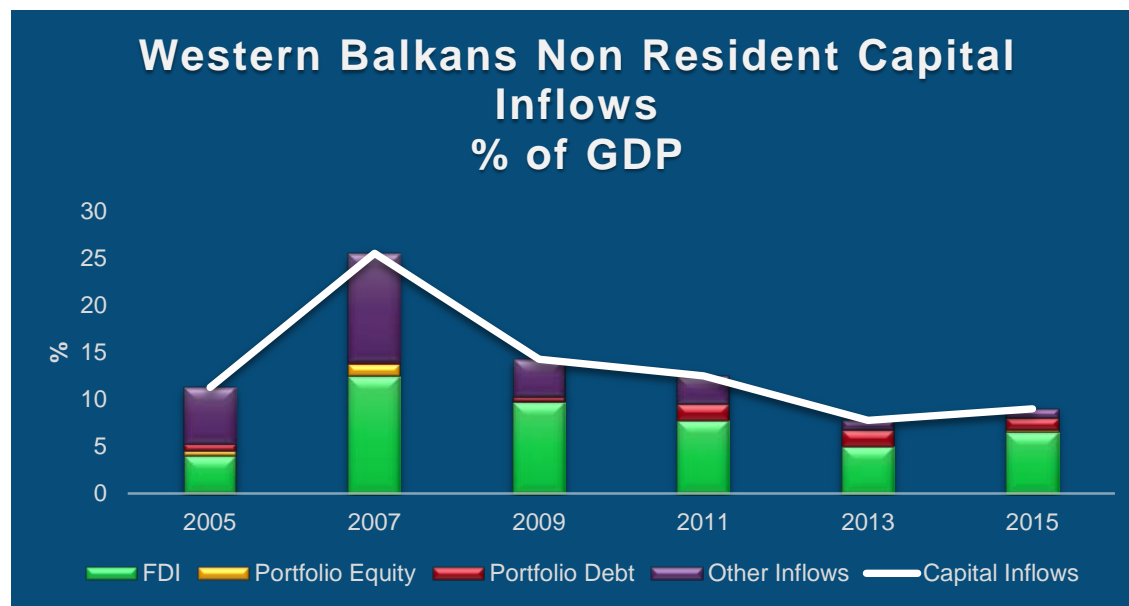
Index		BILLS	1-3	3-5	5-7	7-10	10-20	20+
Average annual return		3.55%	4.91%	6.21%	6.83%	7.16%	8.05%	8.55%
Volatility		1.86%	2.62%	4.27%	5.20%	6.26%	7.06%	9.31%
VaR (minimum return) 95% confidence	1 month	0.01%	-0.39%	-1.31%	-1.88%	-2.59%	-3.43%	-4.51%
	3 months	0.04%	-0.29%	-1.61%	-2.50%	-3.13%	-4.39%	-6.49%
	1 year	0.14%	1.10%	-0.79%	-1.99%	-4.05%	-5.40%	-8.21%
	3 years	4.06%	5.34%	5.87%	7.01%	8.66%	13.04%	13.38%

- Is the central bank willing to broaden eligible asset classes to manage efficiently long investment horizon Investment Tranches?

Reserve Adequacy and tranching.

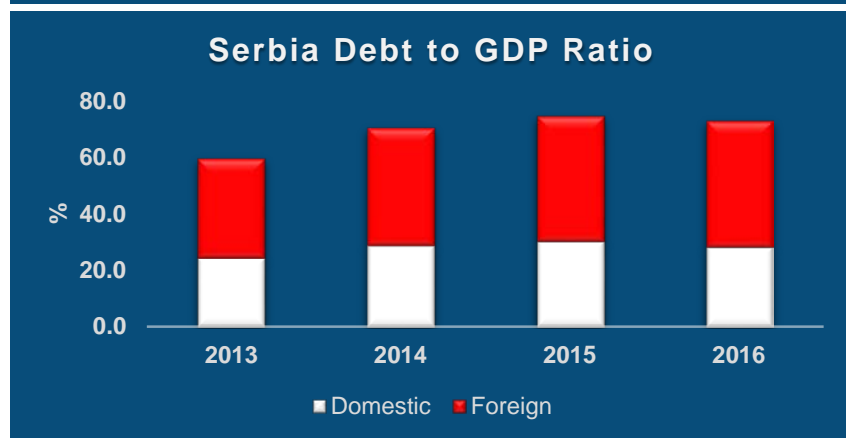
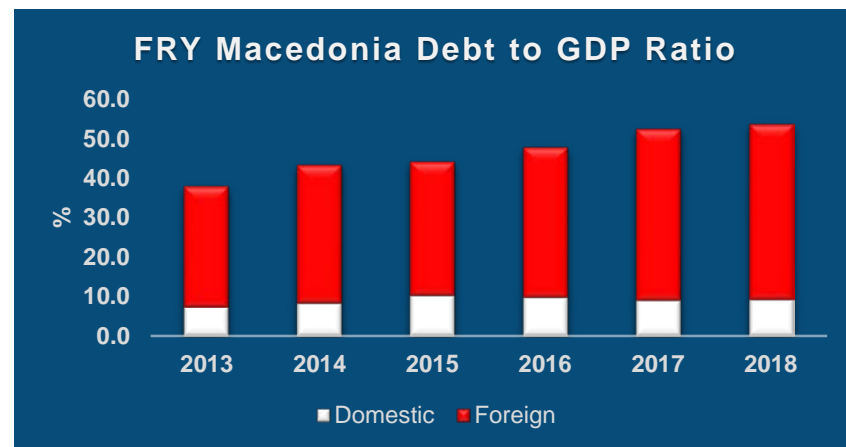
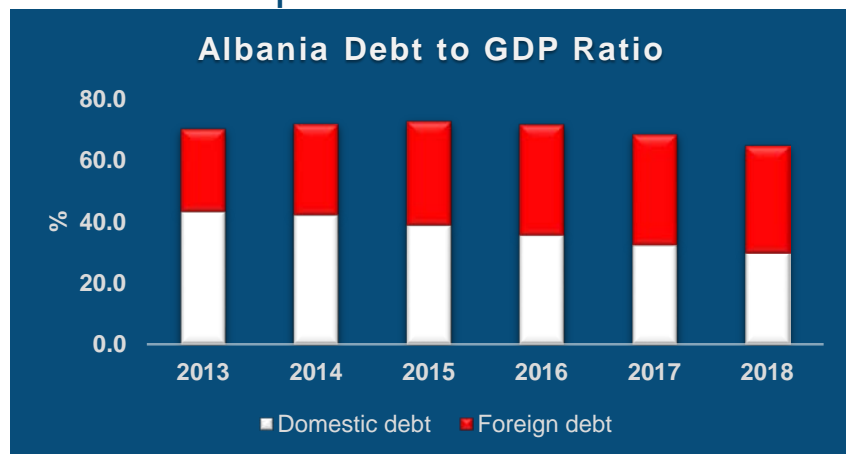
The analysis of the specific vulnerabilities of each country may lead to a more efficient specification of the tranching structure of the portfolio.

- Non-resident capital inflows are pro-cyclical raising vulnerabilities by amplifying external shocks, of which portfolio investments represent the more volatile component requiring higher Liquidity tranches. Before the financial crises capital flows reached the equivalent of 25% of GDP predominately as a result of FDI and bank lending consistent with the expansion of foreign bank networks in the region. After the crises, capital inflows collapsed below 10% of GDP, but portfolio debt flows increased.



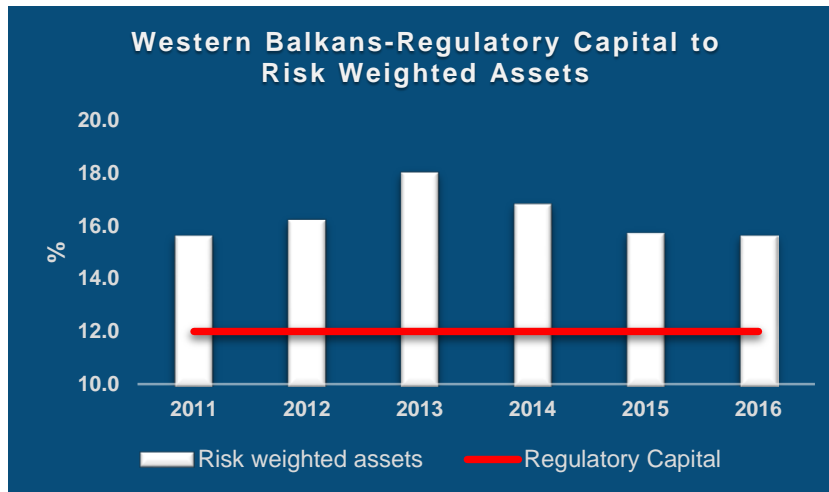
Reserve Adequacy and tranching.

- Countries with high exposure to foreign currency debt and an uneven concentration of STD, require a higher allocation to the Liquidity Tranche, for which some central banks have established Coordinating Committees with the Ministry of Finance to agree on debt management benchmarks to smoothen STD flows over time and in some cases set a target currency composition.

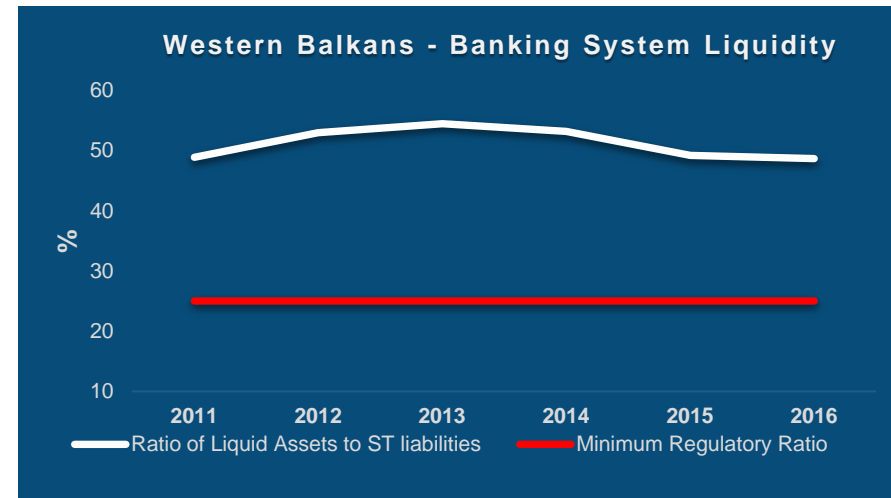


Reserve Adequacy and tranching.

- Indicators of the soundness of the financial system can provide useful information on the allocation of this metric to the Liquidity and the Investment Tranche. The region has suffered recently of bouts of high levels of non performing loans, currency mismatches and contagion from parent companies abroad, although on average in well capitalized, maintains high liquidity to short term liabilities ratios, as well as high regulatory deposits with the central bank.



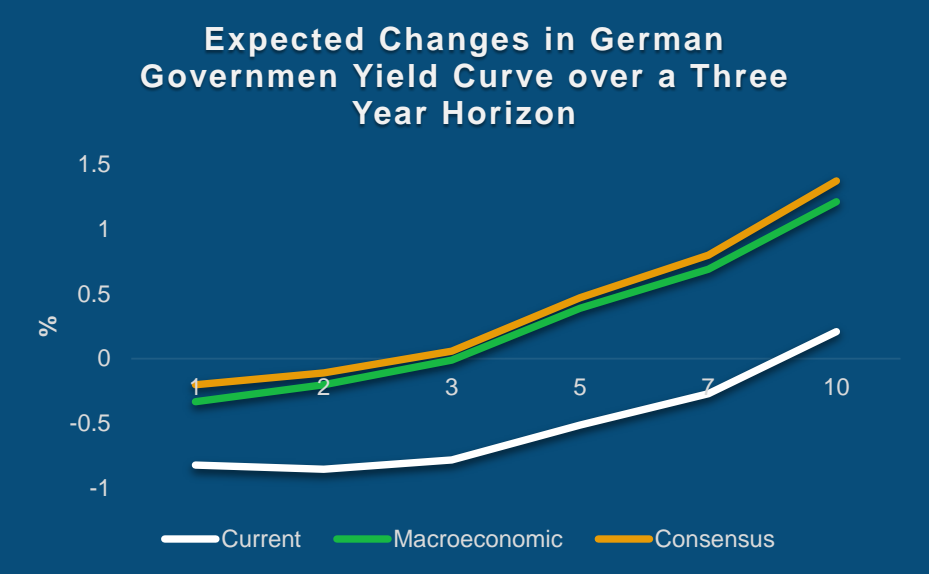
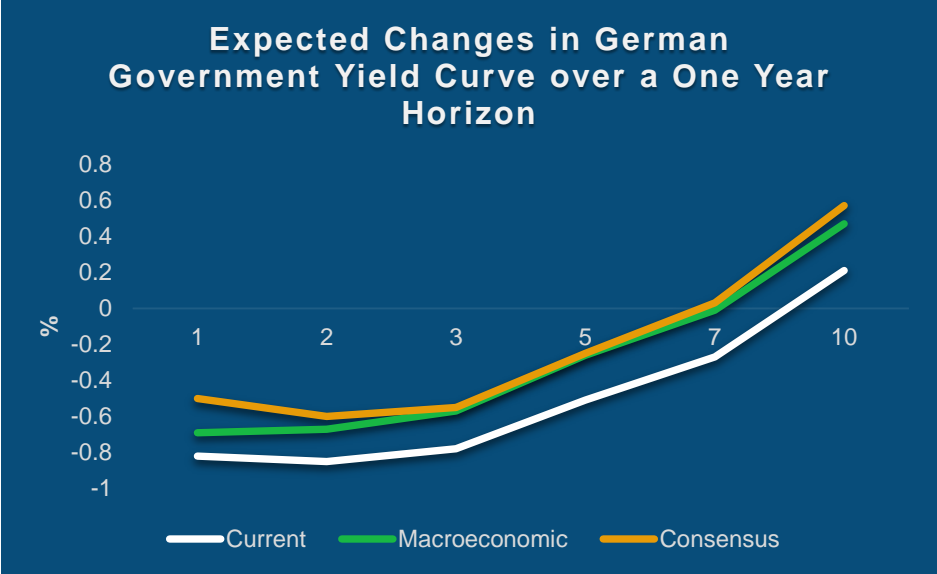
IMF Data Base/Ministry of Finance



- Indicators of exchange rate competitiveness relative to a basket of currencies of major trading partners can provide useful information on the allocation of this metric to the liquidity or investment tranche.

How are your reserves invested to manage the increase of EUR yields embedded in the market consensus?

Strategies to increase duration to enhance returns in a negative interest rate environment will forego future returns if there is a normalization of the yield curve.



Macroeconomic scenario based on Oxford Economics
Market Consensus based on Bloomberg

Duration risk over a one year investment horizon

1Y Horizon

Scenario: Current

Asset	Expected Return [%]	Volatility [%]	VaR Return (95%) [%]	CVaR Return (95%) [%]
GE KRD = 1	(0.9)	0.3	(1.5)	(1.6)
GE KRD = 2	(0.7)	0.8	(2.1)	(2.5)
GE KRD = 3	(0.2)	1.4	(2.7)	(3.3)
GE KRD = 5	0.6	2.6	(3.8)	(4.7)
GE KRD = 7	1.1	3.8	(5.1)	(6.3)
GE KRD = 10	1.4	5.4	(7.1)	(8.9)

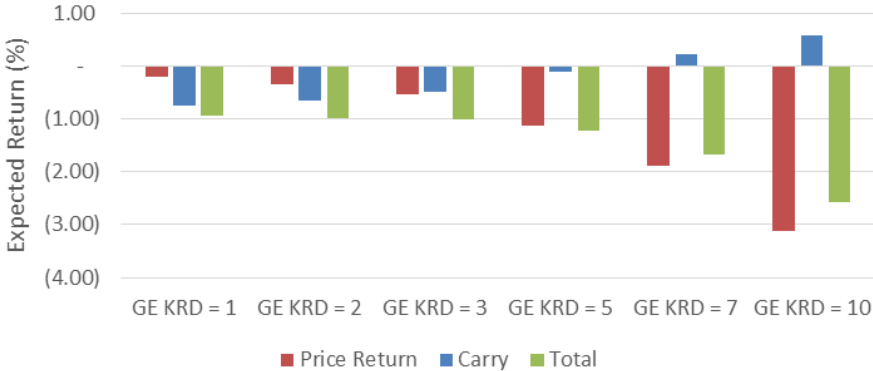
Scenario: Macroeconomic

Asset	Expected Return [%]	Volatility [%]	VaR Return (95%) [%]	CVaR Return (95%) [%]
GE KRD = 1	(0.9)	0.3	(1.5)	(1.6)
GE KRD = 2	(1.0)	0.9	(2.4)	(2.7)
GE KRD = 3	(1.0)	1.4	(3.4)	(3.9)
GE KRD = 5	(1.2)	2.6	(5.5)	(6.4)
GE KRD = 7	(1.7)	3.7	(7.6)	(8.9)
GE KRD = 10	(2.6)	5.3	(10.9)	(12.8)

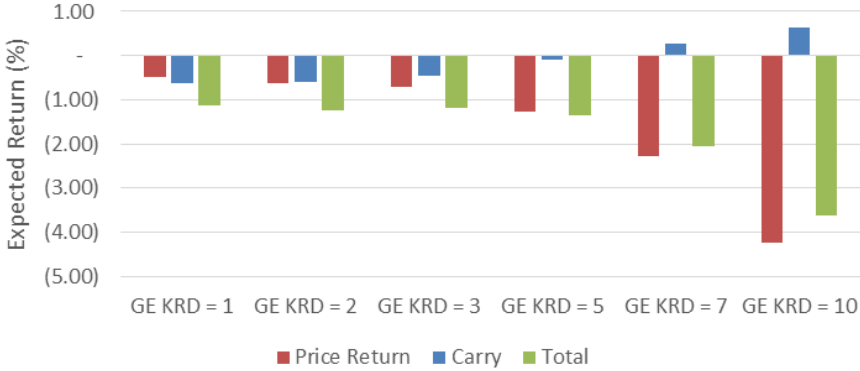
Scenario: Consensus

Asset	Expected Return [%]	Volatility [%]	VaR Return (95%) [%]	CVaR Return (95%) [%]
GE KRD = 1	(1.1)	0.4	(1.7)	(1.9)
GE KRD = 2	(1.2)	0.9	(2.8)	(3.1)
GE KRD = 3	(1.2)	1.5	(3.8)	(4.3)
GE KRD = 5	(1.4)	2.7	(5.6)	(6.7)
GE KRD = 7	(2.1)	3.8	(8.2)	(9.4)
GE KRD = 10	(3.6)	5.3	(12.0)	(13.8)

Macroeconomic Scenario - 1Y



Consensus Scenario - 1Y



World Bank Asset Allocation Workbench simulation results

Duration risk over a three year investment horizon (Annualized)

3Y Horizon

Scenario: Current

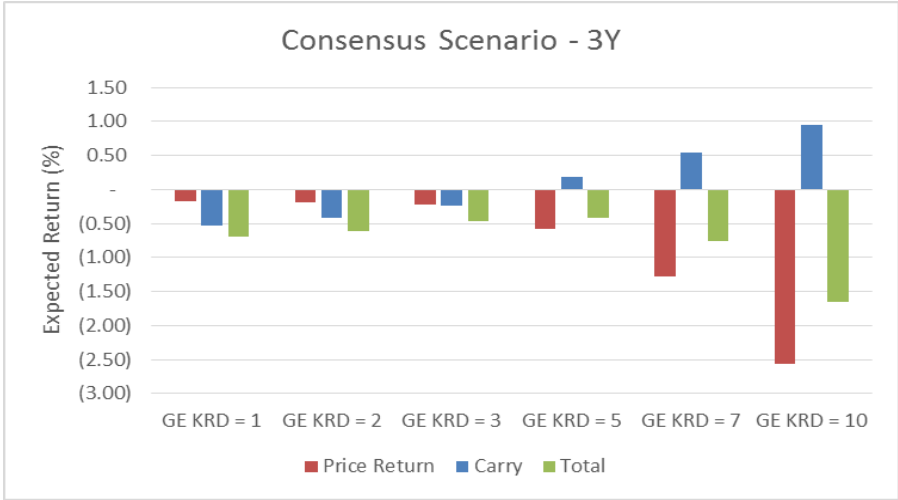
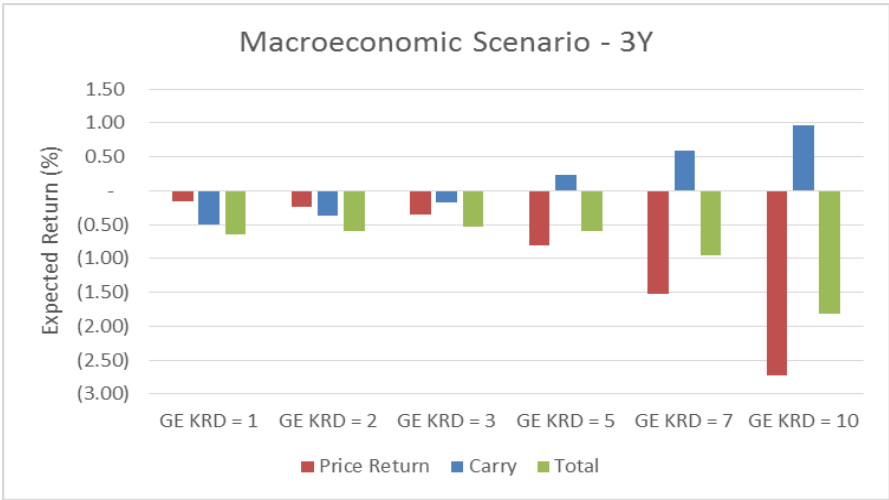
Asset	Expected Return [%]	Volatility [%]	VaR Return (95%) [%]	CVaR Return (95%) [%]
GE KRD = 1	(0.9)	0.3	(1.3)	(1.4)
GE KRD = 2	(0.6)	0.4	(1.2)	(1.4)
GE KRD = 3	(0.2)	0.5	(1.1)	(1.4)
GE KRD = 5	0.5	1.0	(1.2)	(1.5)
GE KRD = 7	1.0	1.5	(1.5)	(2.1)
GE KRD = 10	1.3	2.4	(2.6)	(3.4)

Scenario: Macroeconomic Scenario

Asset	Expected Return [%]	Volatility [%]	VaR Return (95%) [%]	CVaR Return (95%) [%]
GE KRD = 1	(0.6)	0.3	(1.2)	(1.2)
GE KRD = 2	(0.6)	0.4	(1.2)	(1.4)
GE KRD = 3	(0.5)	0.6	(1.5)	(1.6)
GE KRD = 5	(0.6)	1.0	(2.2)	(2.6)
GE KRD = 7	(1.0)	1.5	(3.4)	(3.9)
GE KRD = 10	(1.8)	2.2	(5.4)	(6.1)

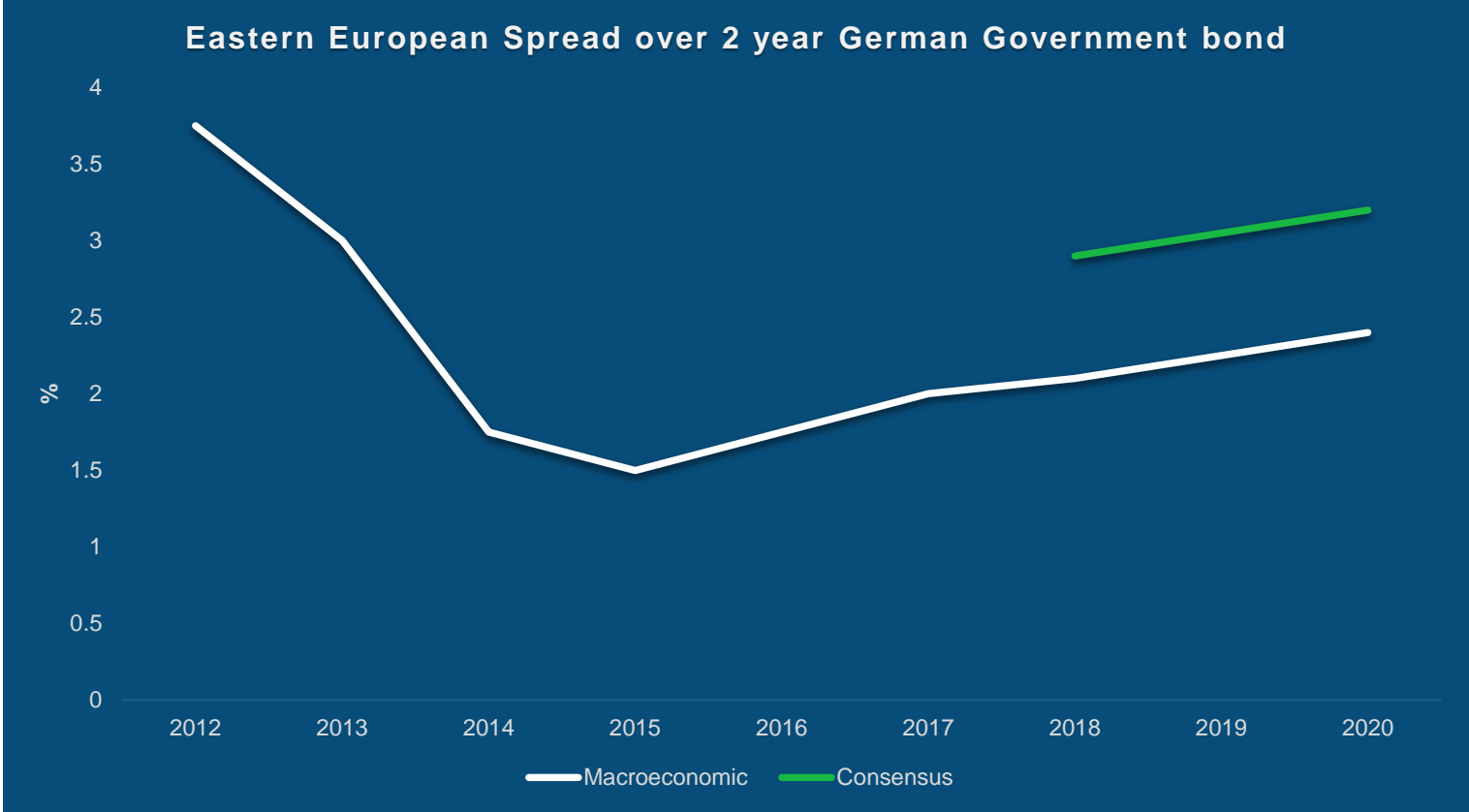
Scenario: Consensus

Asset	Expected Return [%]	Volatility [%]	VaR Return (95%) [%]	CVaR Return (95%) [%]
GE KRD = 1	(0.7)	0.3	(1.2)	(1.3)
GE KRD = 2	(0.6)	0.4	(1.3)	(1.4)
GE KRD = 3	(0.5)	0.5	(1.4)	(1.6)
GE KRD = 5	(0.4)	1.0	(2.0)	(2.4)
GE KRD = 7	(0.8)	1.4	(3.1)	(3.6)
GE KRD = 10	(1.7)	2.1	(5.0)	(5.8)



World Bank Asset Allocation Workbench simulation results

Spread strategies to enhance return in a negative interest rate environment may improve future returns so long as you don't pick the "bad" apple or if a systemic event occurs. Diversification reduces overall portfolio risk to credit, but not reputational risk concerns.



Based on projected spreads of Eastern European countries that are part of the EU but not in the Euro Zone

Spread risk over a one year and three year investment horizon using 2 year bonds.

1Y Horizon

Scenario: Current

Asset	Expected Return [%]	Volatility [%]	VaR Return (95%) [%]	CVaR Return (95%) [%]
German Govt Bond	(0.7)	0.8	(2.1)	(2.5)
With Eastern Europe Spread	1.4	1.6	(1.1)	(1.8)

Scenario: Macroeconomic

Asset	Expected Return [%]	Volatility [%]	VaR Return (95%) [%]	CVaR Return (95%) [%]
German Govt Bond	(1.0)	0.9	(2.4)	(2.7)
With Eastern Europe Spread	0.9	1.5	(1.5)	(2.0)

Scenario: Consensus

Asset	Expected Return [%]	Volatility [%]	VaR Return (95%) [%]	CVaR Return (95%) [%]
German Govt Bond	(1.2)	0.9	(2.8)	(3.1)
With Eastern Europe Spread	(0.4)	1.5	(2.8)	(3.4)

3Y Horizon

Scenario: Current

Asset	Expected Return [%]	Volatility [%]	VaR Return (95%) [%]	CVaR Return (95%) [%]
German Govt Bond	(0.6)	0.4	(1.2)	(1.4)
With Eastern Europe Spread	1.4	0.6	0.4	0.1

Scenario: Macroeconomic Scenario

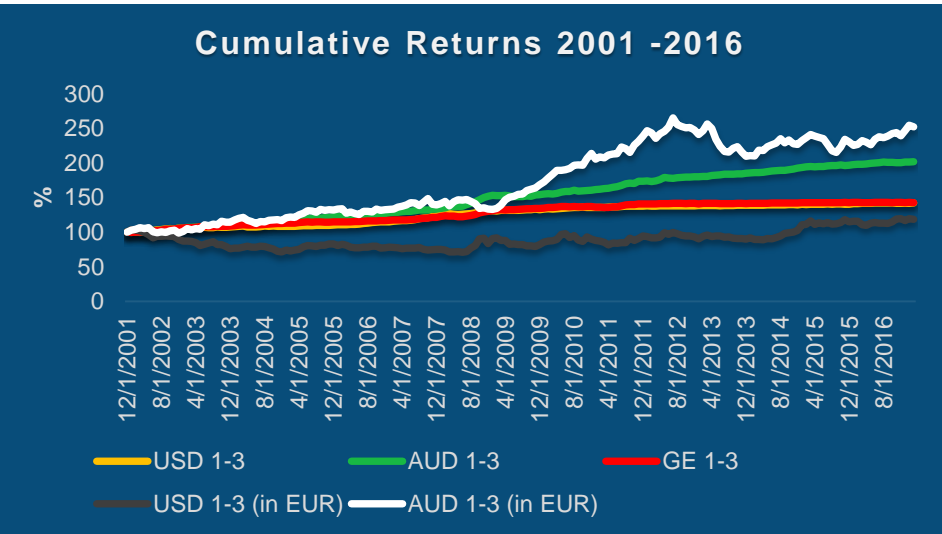
Asset	Expected Return [%]	Volatility [%]	VaR Return (95%) [%]	CVaR Return (95%) [%]
German Govt Bond	(0.6)	0.4	(1.2)	(1.4)
With Eastern Europe Spread	1.4	0.6	0.4	0.0

Scenario: Consensus

Asset	Expected Return [%]	Volatility [%]	VaR Return (95%) [%]	CVaR Return (95%) [%]
German Govt Bond	(0.6)	0.4	(1.3)	(1.4)
With Eastern Europe Spread	1.3	0.6	0.2	0.0

World Bank Asset Allocation Workbench simulation results

FX strategies to enhance return in a negative interest rate environment may improve long term returns, as well as benefit from diversification, but expose the portfolio in the short term to the higher volatility of exchange rates against the natural reserve management numeraire.

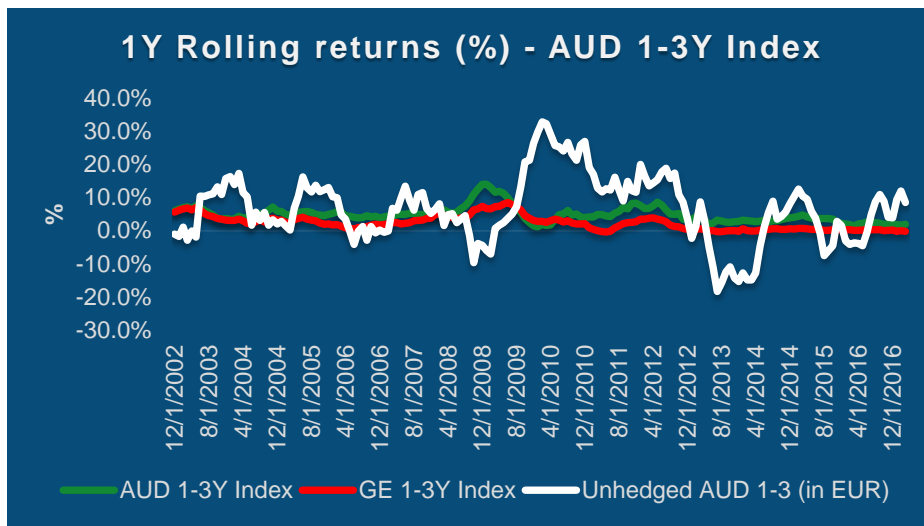
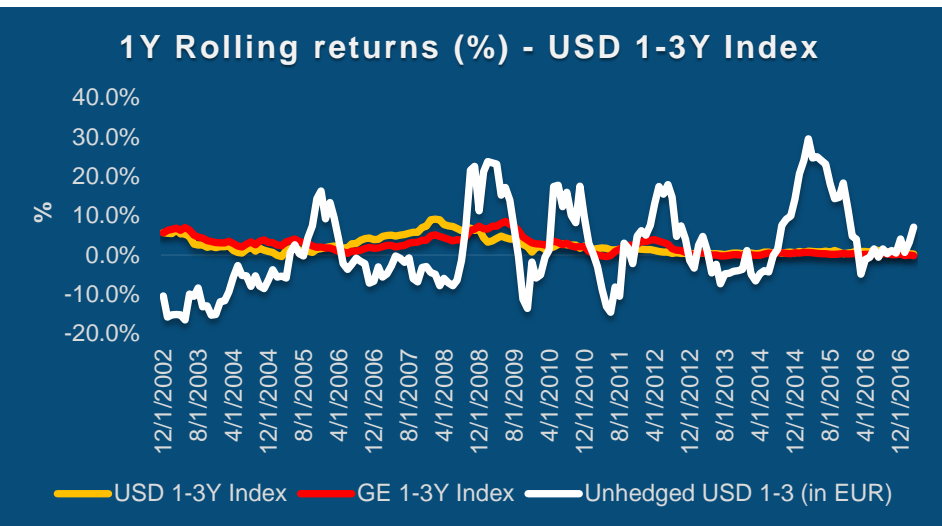


Currency Risk

	USD 1-3 Yr	AUD 1-3 Yr	GER 1-3 Yr	USD 1-3 Unhedged	AUD 1-3 Unhedged
Highest	9.2	14.1	8.5	29.6	32.8
Lowest	-0.3	1.2	-0.3	-16.5	-18.3
Volatility	2.1	2.4	2.2	10.5	10

Correlations

	GE 1-3	USD 1-3 in EUR	AUD 1-3 in EUR
GE 1-3	1		
USD 1-3 in EUR	-(0.01)	1	
AUD 1-3 in EUR	0.1	0.1	1



Central Banks with reserves in excess of short term liquidity needs may find it efficient to manage currency exposure in their Investment Tranches

The main reasons why central banks manage currency exposures beyond the reserve numeraire, are as follows:

- Hedge their balance sheets from non Euro denominated external debt contracted by the central bank (IMF SDR denominated loans)
- Hedge public debt contracted in other currencies, as part of a strategy to reduce inefficiencies in the consolidated balance sheet of the central bank and the government.
- Preserving the value of the reserves in terms of a basket of imports, specially in closed economies.
- Currency diversification to meet a fat tail event?

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Negative euro area interest rates and reserve management at the National Bank of Romania

Victor Andrei, Director, Market operations department

Tirana, 4 May 2017

The views and opinions expressed in this presentation are those of the author and do not necessarily reflect the official policy or position of the NBR

Setting the stage

Romania foreign trade

Is mostly with European countries

- Approx. 86% of exports and 89% of imports

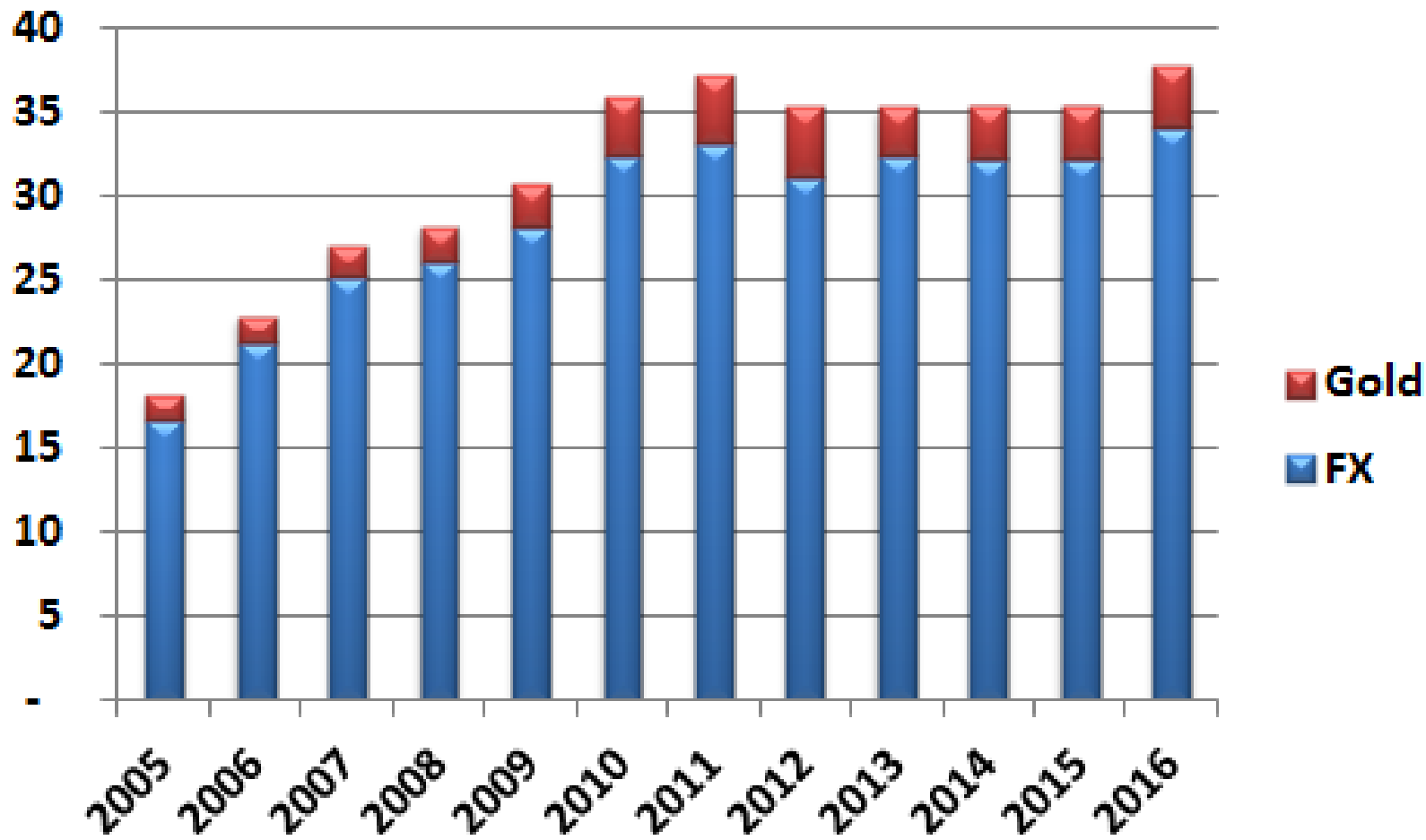
With the other 27 EU countries

- Approx. 75% of exports and 77% of imports

**It is not a coincidence that the main share of our
Foreign reserves is euro denominated**

Level of international reserves

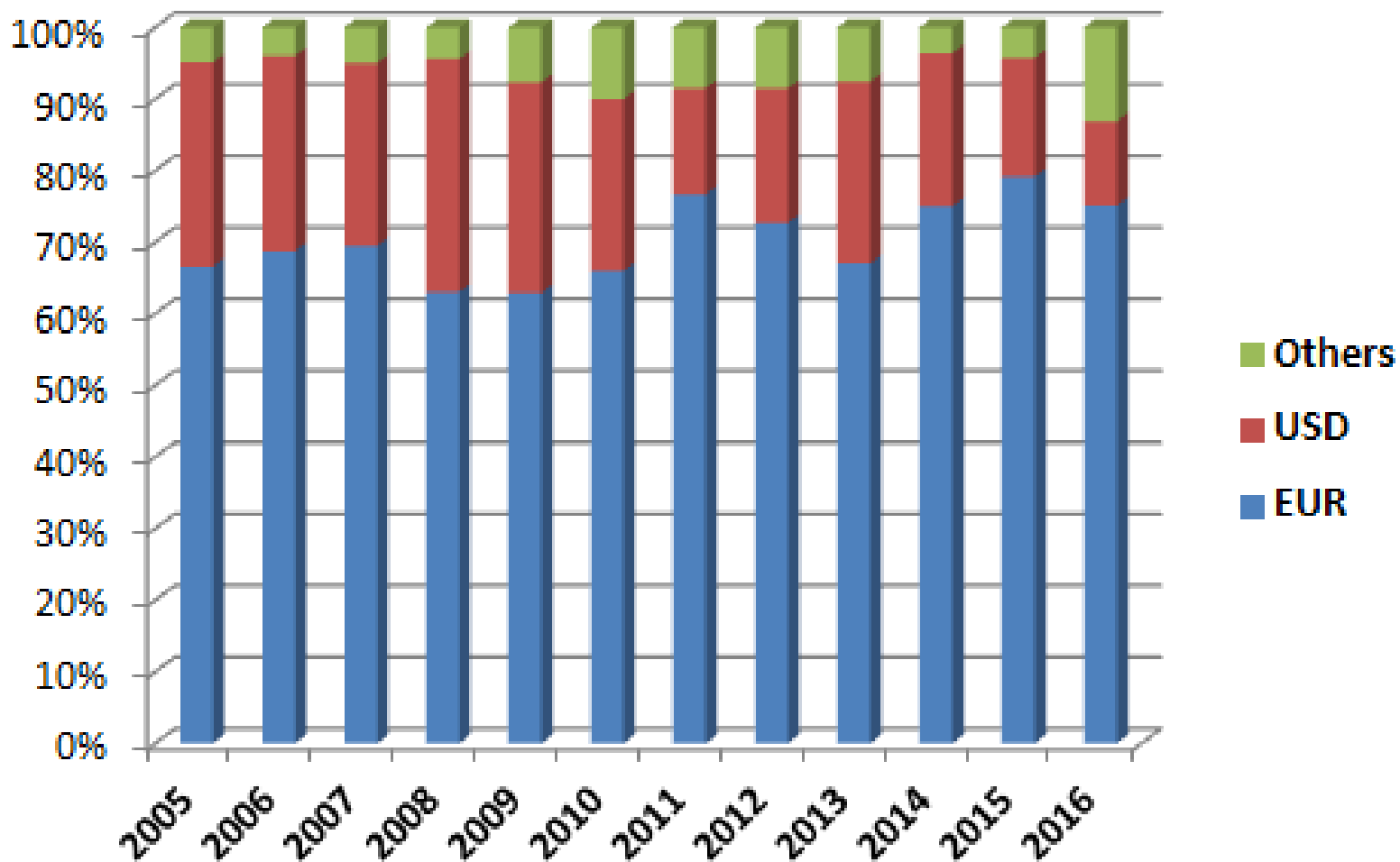
(EoY figures, billion euro equivalent)



Source: Monthly NBR reports on FCY reserves

Structure by currency of FX reserves

(EoY figures)



Source: NBR data

Strategic goals for the 2009-2010 period (excerpt)

- Investment horizon – one year;
- currency composition (i) euro accounts for 55 to 85 percent of foreign currency reserves, (ii) the US dollar for 10 to 40 percent and (iii) other currencies for at most 10 percent of foreign currency reserves;
- the following categories of issuers: (i) the US government; (ii) government agencies or agencies sponsored by the US government; (iii) the governments of EU Member States; (iv) government agencies or agencies sponsored by the governments of EU Member States; (v) other AAA-rated governments; (vi) supranational institutions; (vii) private entities, issuers of European Covered Bonds;

Strategic goals for the 2009-2010 period (excerpt)

- a maximum exposure of 10 percent of international reserves to private entities that are issuers of European Covered Bonds and
- a maximum exposure of 10 percent of international reserves to private entities other than issuers of European Covered Bonds.

Exposure to private entities assumed only following the approval by the NBR Board.

Strategic goals changes (excerpt)

The key strategic objectives changes for the 2011-2015 period

- Need for a prudent management of risks arising from the relation between the foreign assets and liabilities of the central bank, considering the characteristics of the Stand-By Agreement signed by Romania and the IMF in 2009 and the high uncertainties surrounding the economic and financial developments worldwide;
- Under the new circumstances, the NBR Board decided to extend the investment horizon from 1 to 5 years;
- The “other currencies” has been increased to at most 15 percent of foreign currency reserves and USD changed to 15-35%;
- The establishment of an average duration of up to six months for the entire foreign currency reserves, as well as for each foreign currency;
- The addition of the fixed-income securities issued by the government of Japan;

Strategic goals changes (excerpt) cont'd

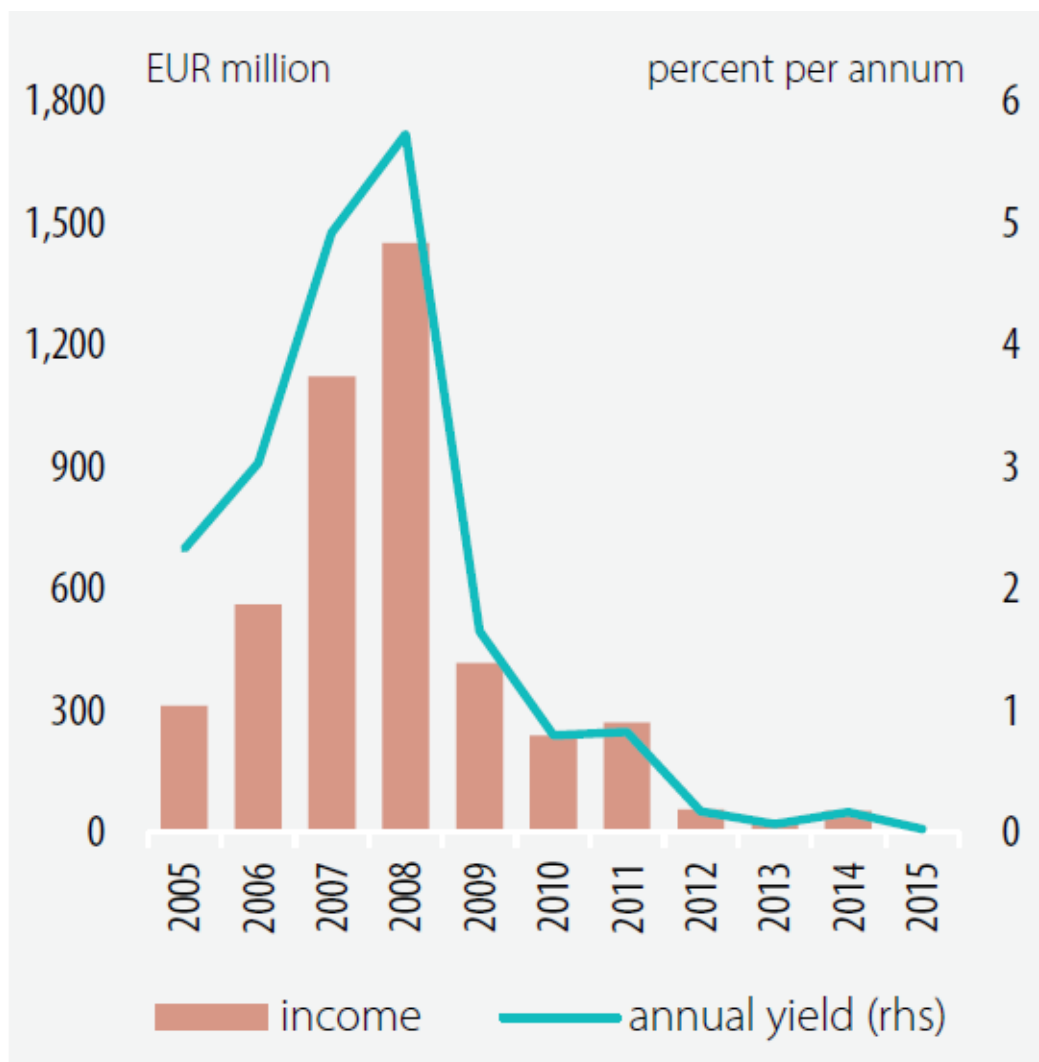
The key strategic objectives changes for the 2016-2017 period

- Three tranches approach
- Extended overall portfolio modified duration to 1.25 years
- New currencies allowed (since 2015, kept in the new strategy)
- Still no derivative products
- Other currencies increased to at most 20 (from 15) percent of foreign currency reserves;
- USD to 10-35% of the foreign currency reserves
- Relaxed a bit issuer risk /minimum required rating

Exposure to private entities still restricted for the time being

And last but not least more active/tactical trading

Returns on foreign exchange reserves



Challenges

- As approx. $\frac{3}{4}$ of FX reserves in euro, big pressure on revenues
- Considering that the income generation on euro is actually a negative one, that the high liquidity/quality assets tend to yield even lower returns, we are facing higher opportunity cost of holding reserve assets and potential capital losses if rates normalize
- On the other hand, higher yielding assets may be too risky or volatile and significant losses can arise due to asset switches

So... the real question is... how much to increase the portfolio duration, expand the asset classes and diversify currency structure?



Now

or...

anytime at

victor.andrei@bnro.ro



Implementation of the new FX reserves investment strategy at the Central Bank of Hungary

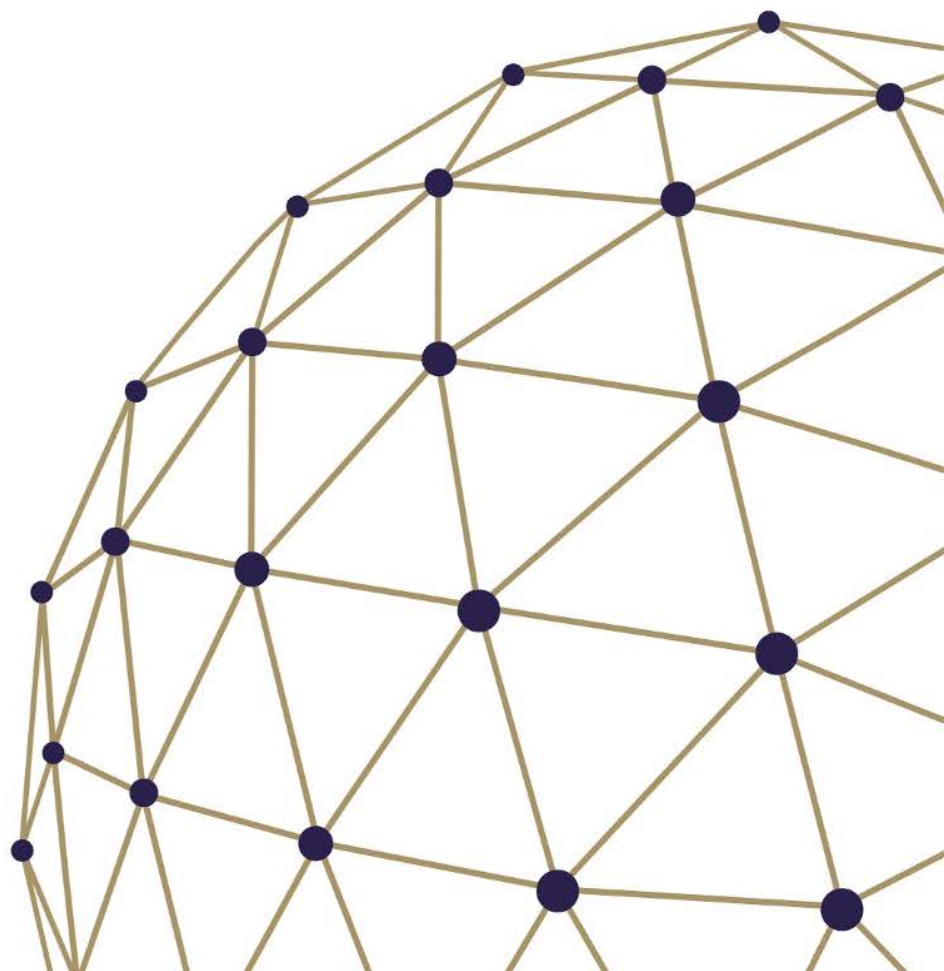
Sándor Ladányi, CFA

Investment strategist

Magyar Nemzeti Bank

Tirana

05 May 2017





Background and motivations for the conceptual change

„The usual suspects“:

- **Low-yield environment:** in the post-crisis era, accommodative central bank policy has dominated asset pricing...
...as a result, EM central banks often earn negative returns on their traditional, safe investments.
- **Worsening liquidity, less traditional investment assets:** market liquidity has been diminishing due to regulatory changes, shrinking „AAA“ universe and central bank quantitative-qualitative easing.
- **Portfolio rebalancing effect:** central banks have to rethink their portfolio compositions as they are forced „up the risk curve“.



Changing investment attitude of central banks

Negative expected return threatens the preservation of capital



Reinterpretation/rethinking of safety from the criteria of safety-liquidity-return

- The importance of avoiding certain/highly probable negative return increased besides simply strictly focusing on limiting extreme losses
- Focus on the middle of the distribution becomes more important (which has shifted to the negative territory) besides of the left tail

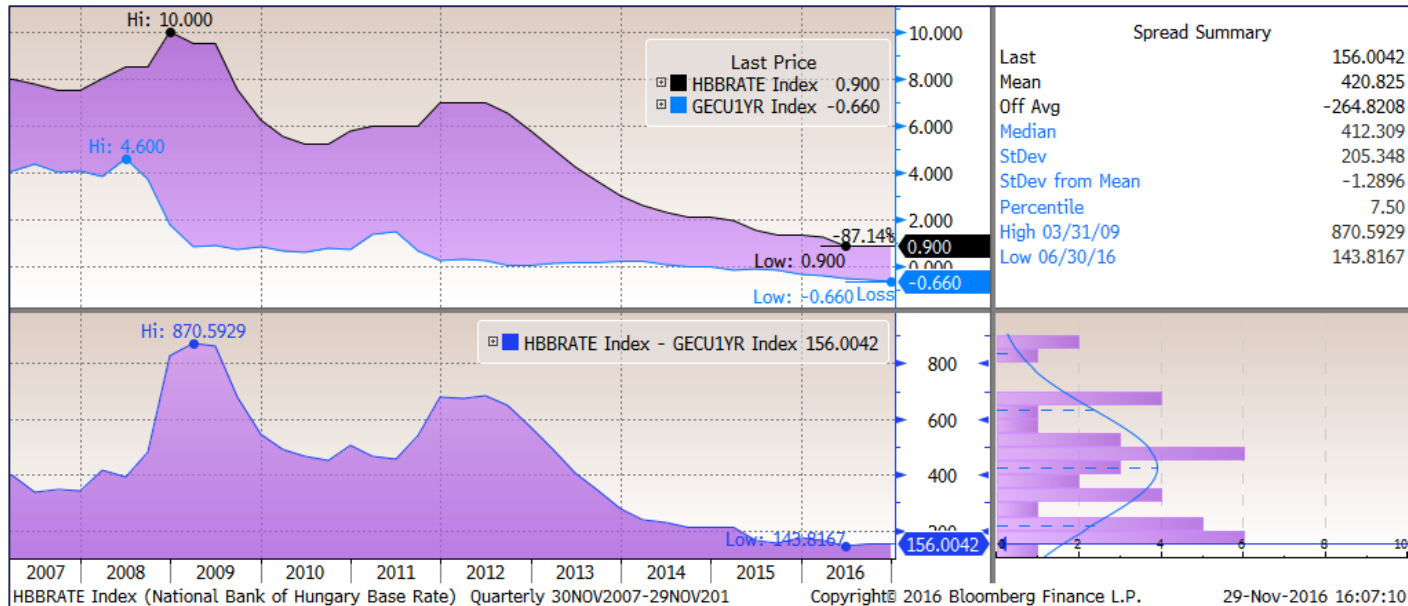


More and more central banks are moving slowly towards riskier investments in their investment strategies in order to avoid capital loss



Spread compression can support overall performance

Historical spread between 1Y EUR benchmark and HUF base rate



Source: Bloomberg

- Low yield levels, credit spread compression eroded asset side profitability
- Sinking base rates diminish liability side costs



Yield spread between assets and liabilities dropped to a historical low



Broad approach - Balance sheet view

Broadening the scope from the asset only view to the assessment of the whole balance sheet

- The asset side of the balance sheet is determined by the reserves \Rightarrow 0% or negative EUR income (FX reserve)
- The liability side is dominated by the bank deposits and the banknotes \Rightarrow 0,9%-0% HUF cost (Central bank base rate-banknotes)

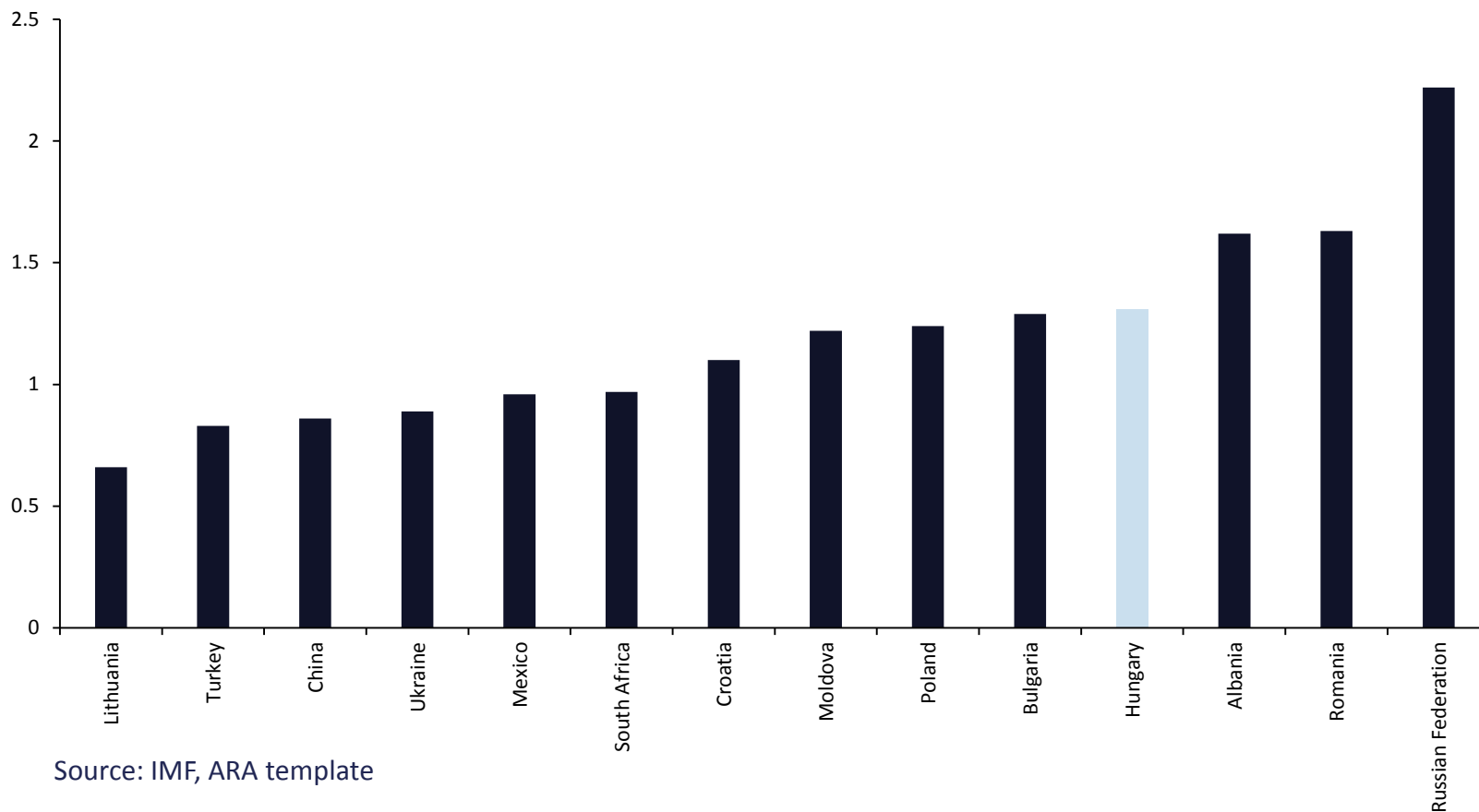


Holding reserves results in negative return both in asset only view and ALM



Hungary's reserves are adequate based on IMF metrics

- Most EM central bank reserves are above the IMF reserve adequacy ratio.
- The additional buffer provides some flexibility in reserve management.



Source: IMF, ARA template



Roadmap of the new investment strategy and SAA framework

- **Starting point:** Low-yield environment, capital preservation in danger → looking for new directions
- **Framework:** Risk Budget framework (main risk measure: Expected Shortfall - ES)
- **Size of the „Risk Budget“:** Target and maximum level for the ES measure, general framework
- **Strategic benchmark:** Mean-Variance Optimization (Scenario-analyses, stress-tests)
- **Implementation phase:** Creating new portfolios, adding new exposures



Assessment criteria for new investment opportunities

Most important aspect is the impact on the risk-reward profile:

- **Return:** our goal is to avoid (or at least to decrease) capital loss
- **Additional risk:** the maximum tolerable/acceptable risk level should be derived from macroeconomic and institution-specific factors

Limiting the additional risk taken

- Expected return can only be increased by taking additional risk, therefore controlling risk is necessary („no free lunch”)
- New framework to control overall-risk: Risk budget - constraining the assumed total risk of whole portfolio, by setting target and maximum risk levels

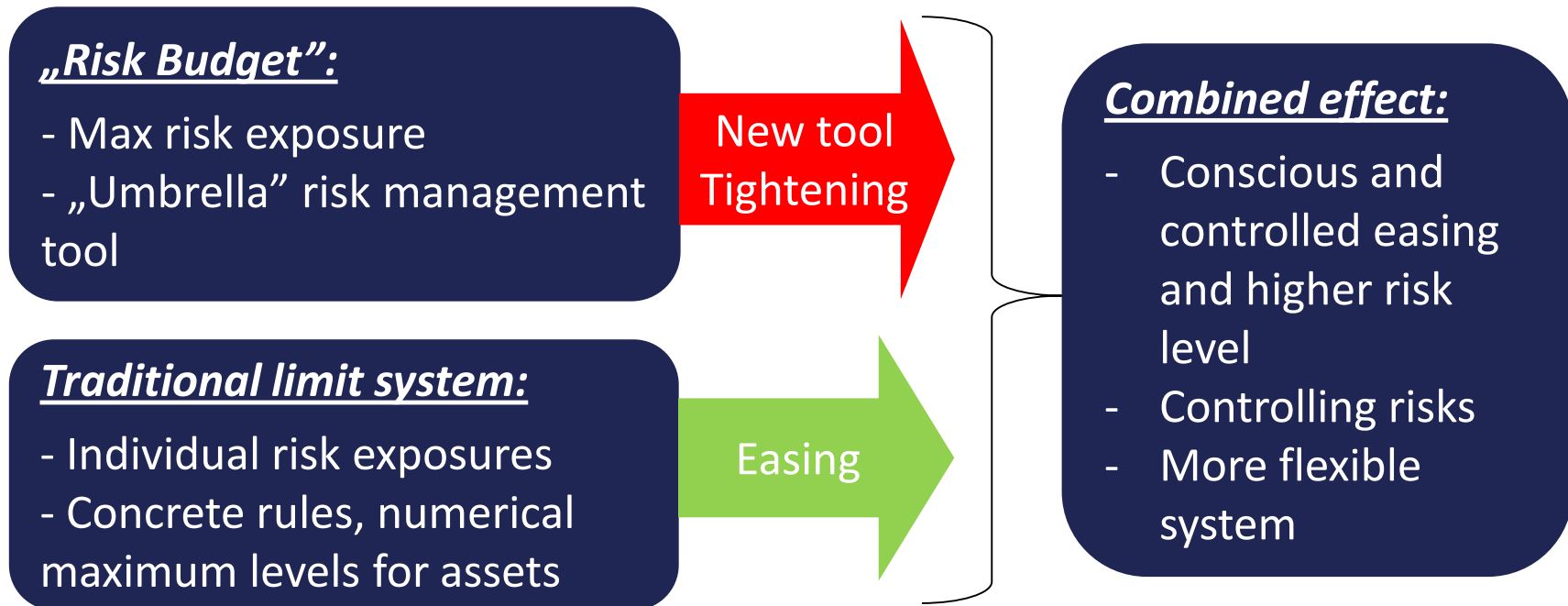


Risk Budget Framework



The change requires a new approach: Two-level, mixed risk management system

- Modifying the current investment policy involves the relaxation of the limit system ➡ need to create new control points
- Solution: implementing „Risk Budget” as a supplementary risk management tool
- The traditional limit system and new risk budget work side-by-side, supplementing each other – with varying effectivity





Risk Budget in practice is a numerical value

The Risk Budget:

1. A risk measure (loss measure),
2. expressed in nominal terms (EUR),
3. which the portfolio cannot breach.

Risk Budget: a limit applied to the total risk of the reserve portfolio

The traditional limit system did not impose such a limit=> previously the portfolio's risk level could move in a wide range.

The main risk measure is the Expected Shortfall (ES) for the Risk Budget (95% confidence level, 1 year).

Monitoring supplemental indicators along with the robust, traditional limits.



Risk Budget Size



Determination of the Risk Budget size is based on a complex system

Institutional constraints, heuristics related to balance sheet

- Reserve adequacy
- Ratios: Potential loss to FX reserves, to Equity size

Historical data:

- Time series of the selected measure
- Minimum / maximum values

Risk Budget:
Maximum and
strategic – targeted –
benchmark

Scenario-analysis, putting into context:

- Hypothetical portfolios
- What, if...
- Defining a range

Subjective elements

- Risk appetite of the decision makers, preferences
- Personal views, expectations, judgements



Summary of the framework

A) The Risk Budget (ES, 95%, 1 year):

- Target risk level of the strategic benchmark
- Maximum risk level of the portfolio
- Tolerance-range of the strategic benchmark – breach of it requires the action of the Monetary Policy Committee or the deputy governor

B) Regular reviews regarding the size:

- Annually
- Event-based: change of the FX reserves or equity by certain predetermined percent;

C) More intense monitoring



SAA and the new strategic benchmark

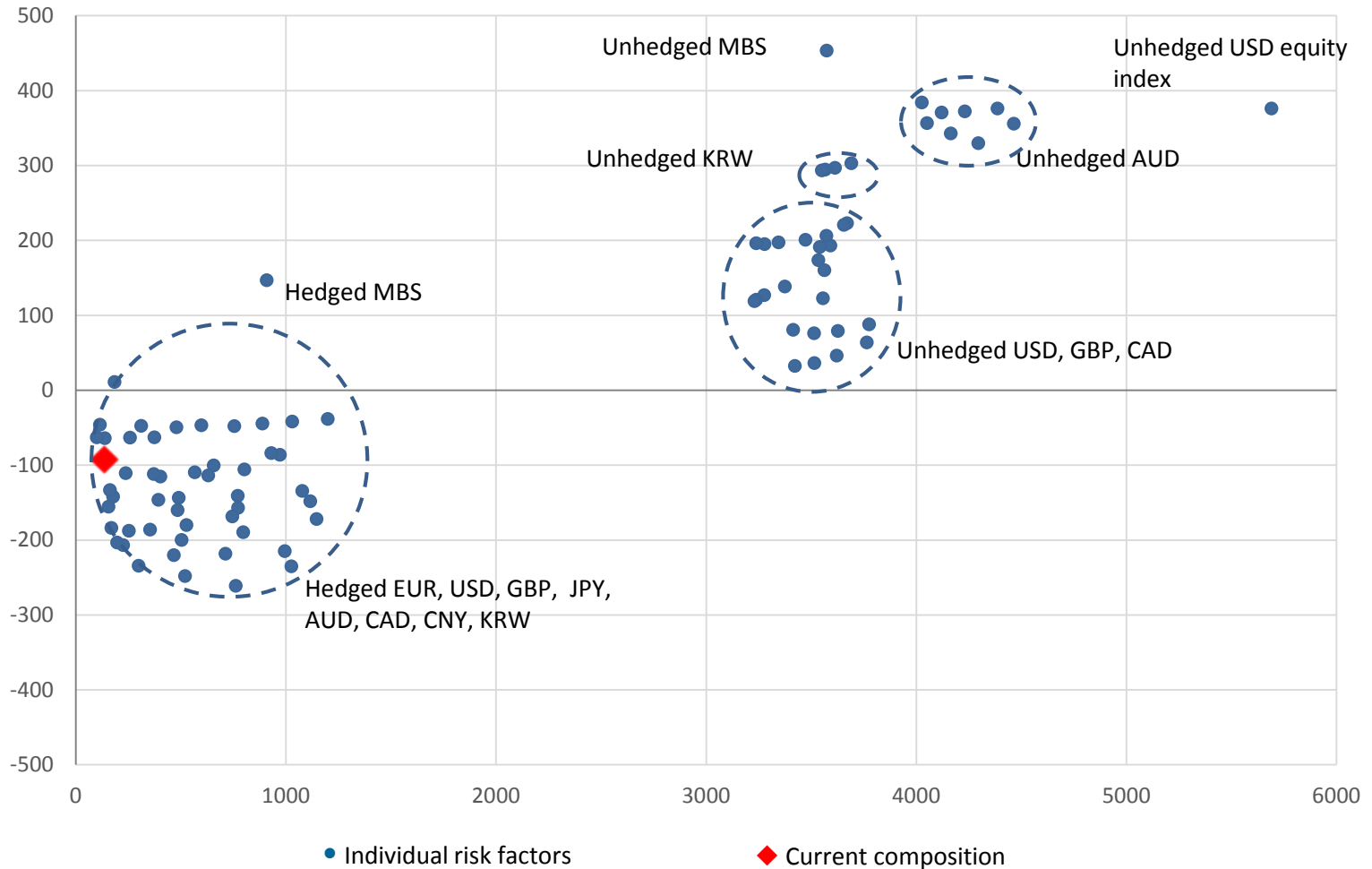


The new strategic benchmark is a product of a multistage process

1. Identification of **relevant directions**, promising asset classes by examining individual risk factors
2. Filtering sample portfolios by usage of „common sense” **investment / efficiency criteria**:
Risk adjusted return, exclusion of dominated portfolios (65 sample portfolios)
3. Choosing portfolios in the proximity of the specified **Expected Shortfall target level**
4. Analyzing the „shortlist” with additional risk measures, scenario-analysis, stress-test
5. **Preferences of the decision-makers & Final decision** on the strategic benchmark



Position of the individual risk factors in the risk-return profile determines the relevant directions





Possible changes to the strategic benchmark

Geographical diversification

- Shrinking euro government bond portfolio (due to negative yields),
- Promising markets: AUD, CAD, KRW portfolios.

Open currency position

- Not hedging to EUR and earning the carry: USD, AUD.

Asset allocation

- Increasing the agency MBS exposure
- Creating equity portfolio



Geographical diversification

- Ranking is based on a scoring system (fundamentals, sovereign credit rating, market size/depth-liquidity, etc.).
- AUD and CAD topped the ranking.

Criteria	AUD	CAD	KRW	NOK	SEK	NZD	DKK	CHF	SGD
Credit rating	1	1	0,5	1	1	0,5	1	1	0
Fundamentals	0,8	0,7	1	0,9	0,7	0,7	0,8	0,5	0,5
Market size, depth, liquidity	1	1	0,4	0,9	0,9	0,1	0,8	0,9	0,1
Excess return	0,5	0,5	1	0	0	0	0	0	0
Financial market stability	1	1	0,5	1	1	1	1	0,5	1
International practise	1	1	0	0,25	0,25	0	0	0,25	0
Diversification	1	0,5	1	0	0	1	0	0	1
Sum	6,3	5,7	4,4	4,0	3,8	3,3	3,5	3,1	2,7

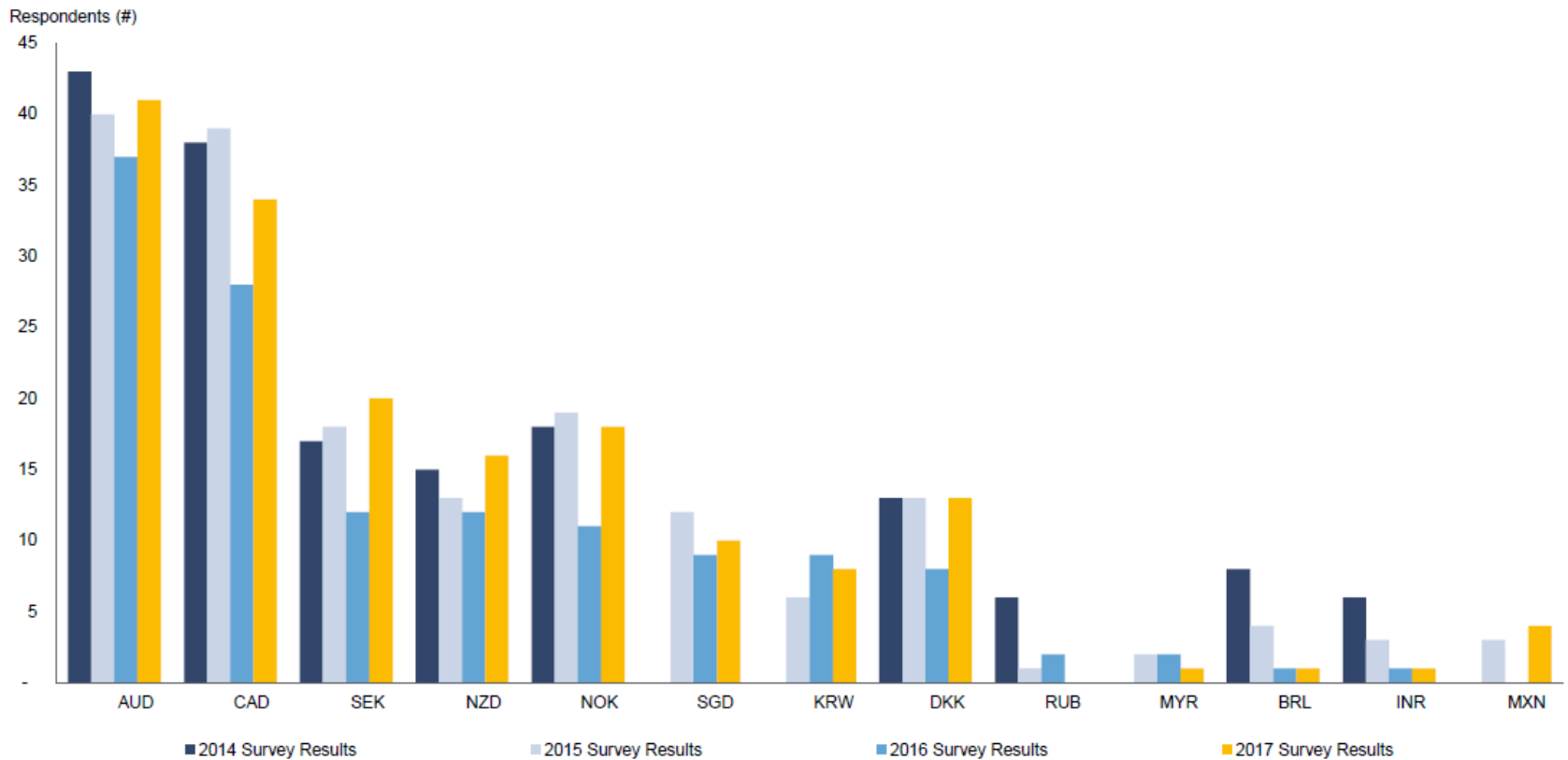
EUR	USD	JPY	GBP
1	1	0	0,5
0,7	0,5	0,3	0,5
1	1	1	1
0	0,7	0,9	0,5
0,5	1	1	1
1	1	1	1
0	0,5	1	0
4,2	5,7	5,2	5,0



Geographical diversification

Our internal scoring result is in line with the views of other central banks.

Number of central banks investing in non-traditional reserve currencies



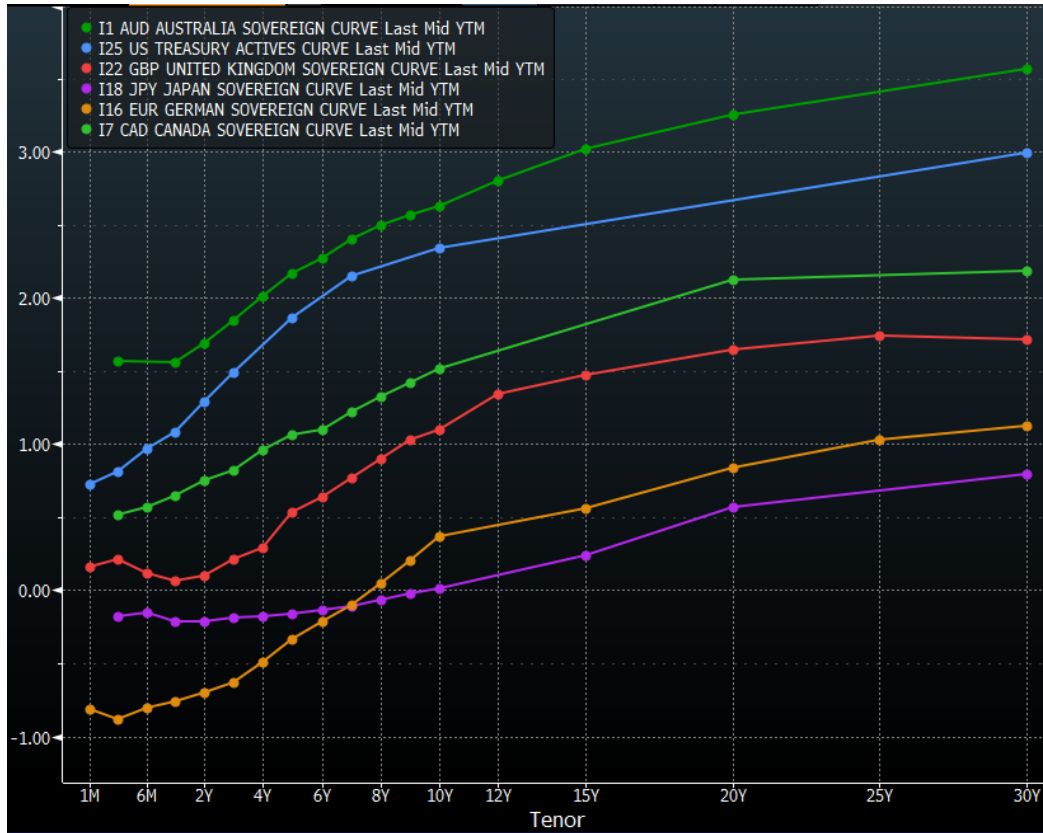
Source: HSBC Reserve Management Trends 2017



Open currency position: most treasury curves are flat

Steep yield curves: AUD and USD → providing some carry if positions are not currency hedged.

Government bond yield curves



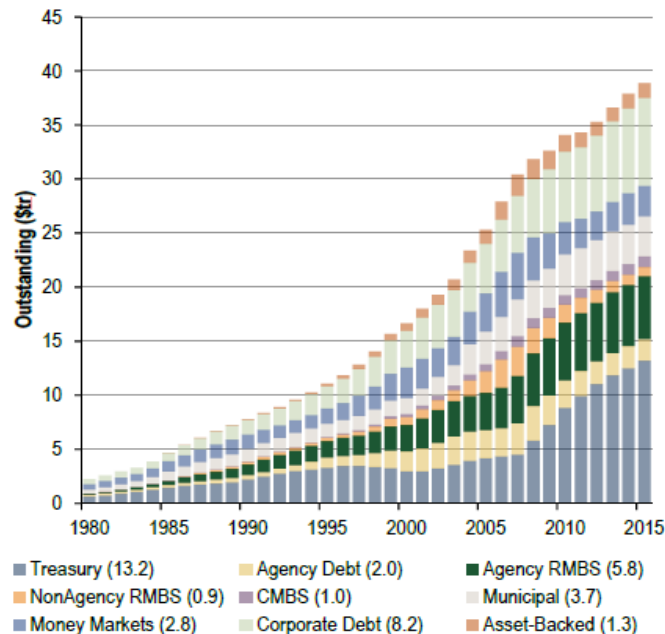
Source: Bloomberg



Asset allocation: Agency MBS

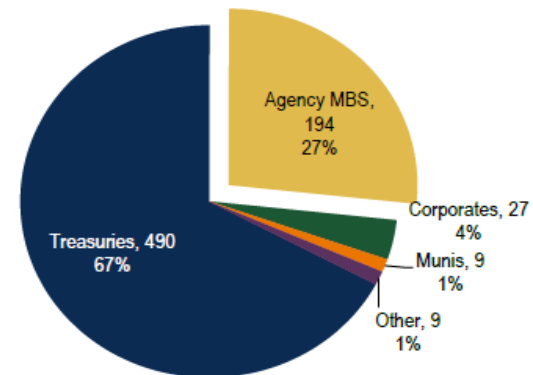
- Third largest US bond sector after Treasuries and corporates (\$5.8tn of the \$45tn US bond market)
- Homogeneous bond market with deep liquidity
- Strong state commitment

Chart 1: MBS is the third largest US bond sector (\$tn)



Source: SIFMA, BoFA Merrill Lynch Global Research

Chart 2: Average daily trading volumes in 2015 by sector (\$bn)



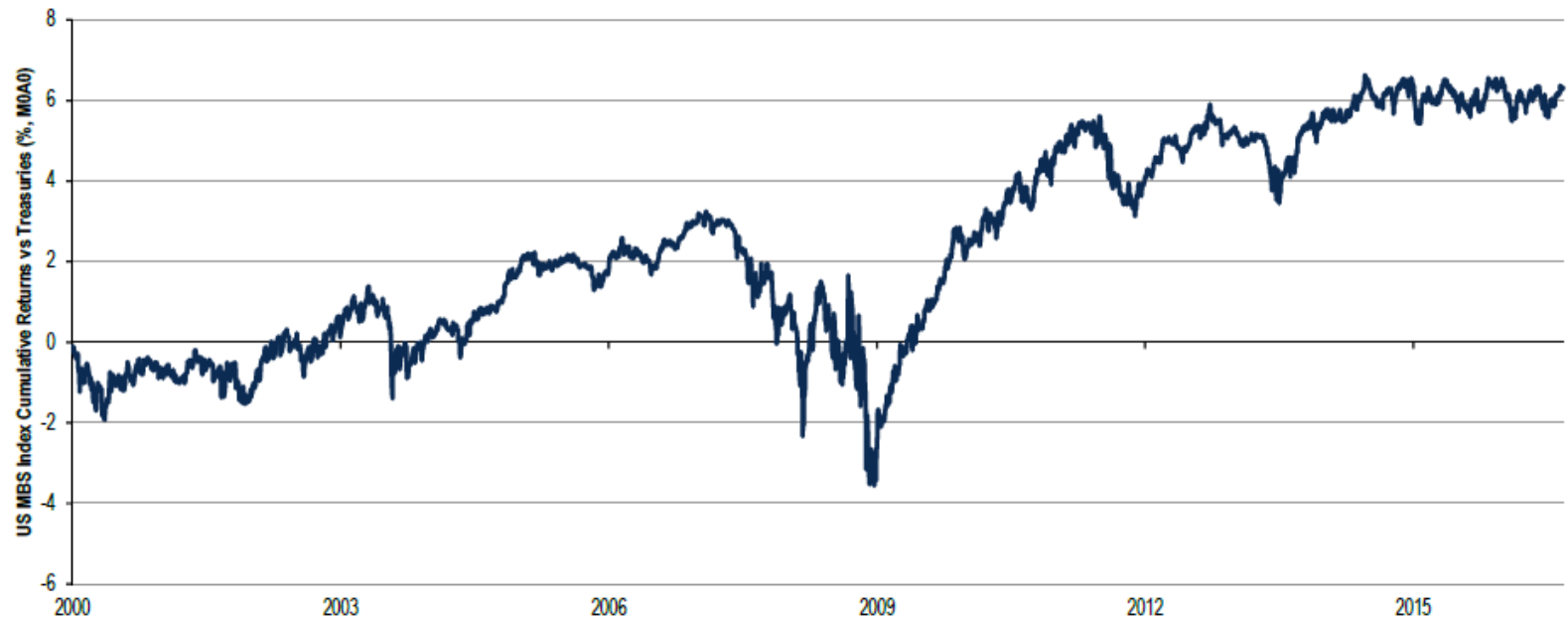
Source: SIFMA, BoFA Merrill Lynch Global Research



Asset allocation: Agency MBS

- High credit quality: AAA rating with the implicit or explicit guarantee of the US government
- Favorable risk adjusted return, spread over Treasuries

Chart 5: Long-term performance of BofAML US Agency MBS Index (MOAO)



Source: BofA Merrill Lynch Global Research



Asset allocation: Equity

Pros:

- Higher expected return
- Diversification benefits
 - Favorable correlation with bonds*
 - Diversification in terms of available sectors*
 - Increase in the number of invested „names“*

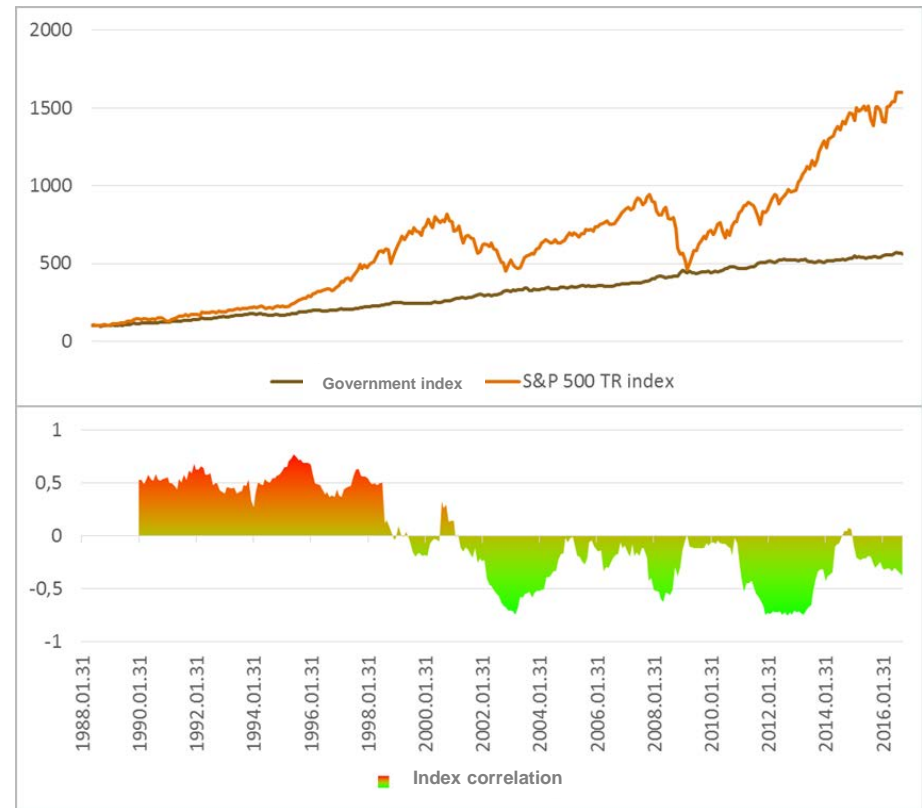
Cons:

- Higher volatility
- Increasing correlation in times of market stress
- Headline risk, communication challenges

Additional considerations

- Use of derivatives
- Communication
- Timing
- Need for external manager(s)
- Benchmark, sector selection

Return and correlation of equities and government bonds

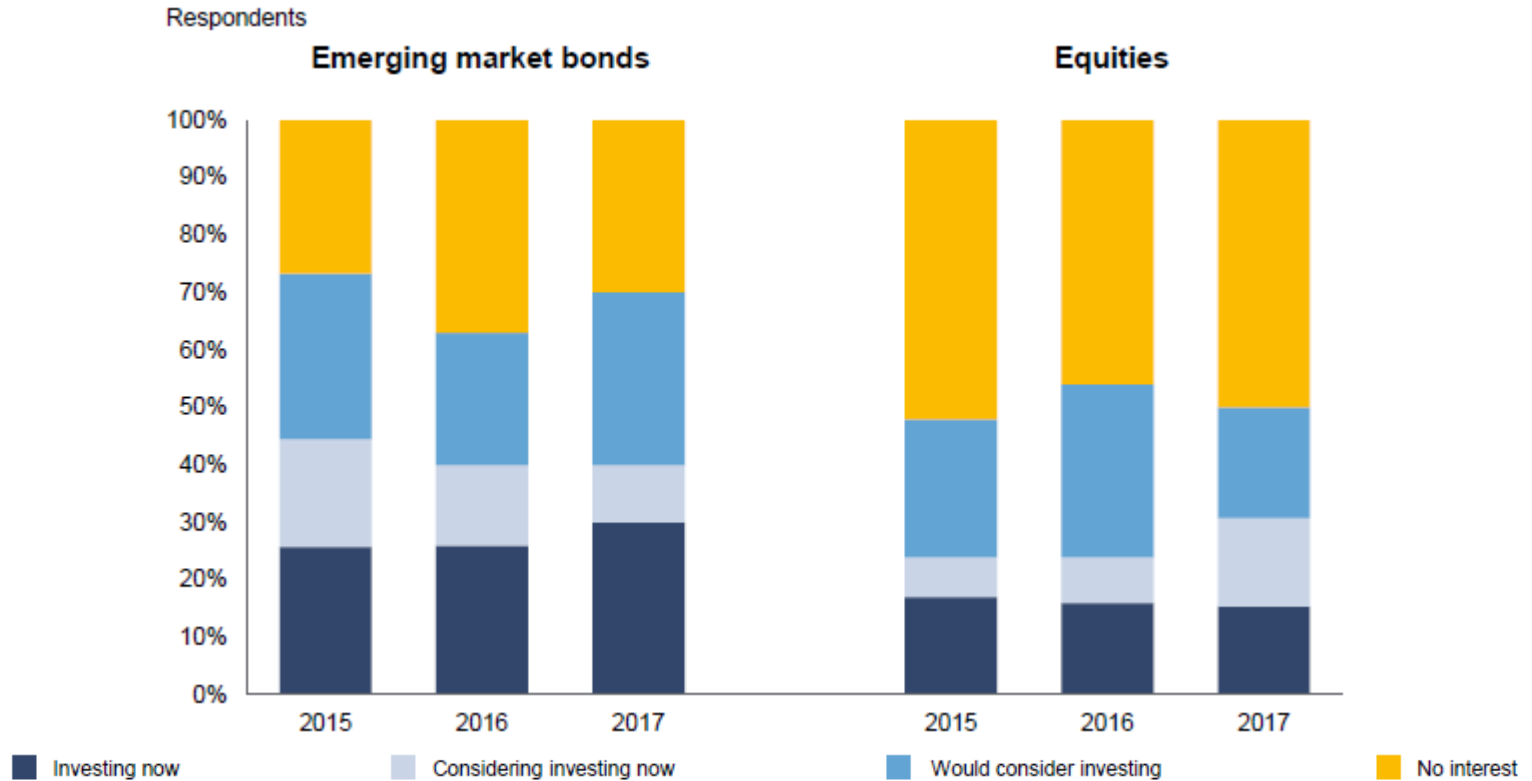


Source: Bloomberg



Asset allocation: Equity

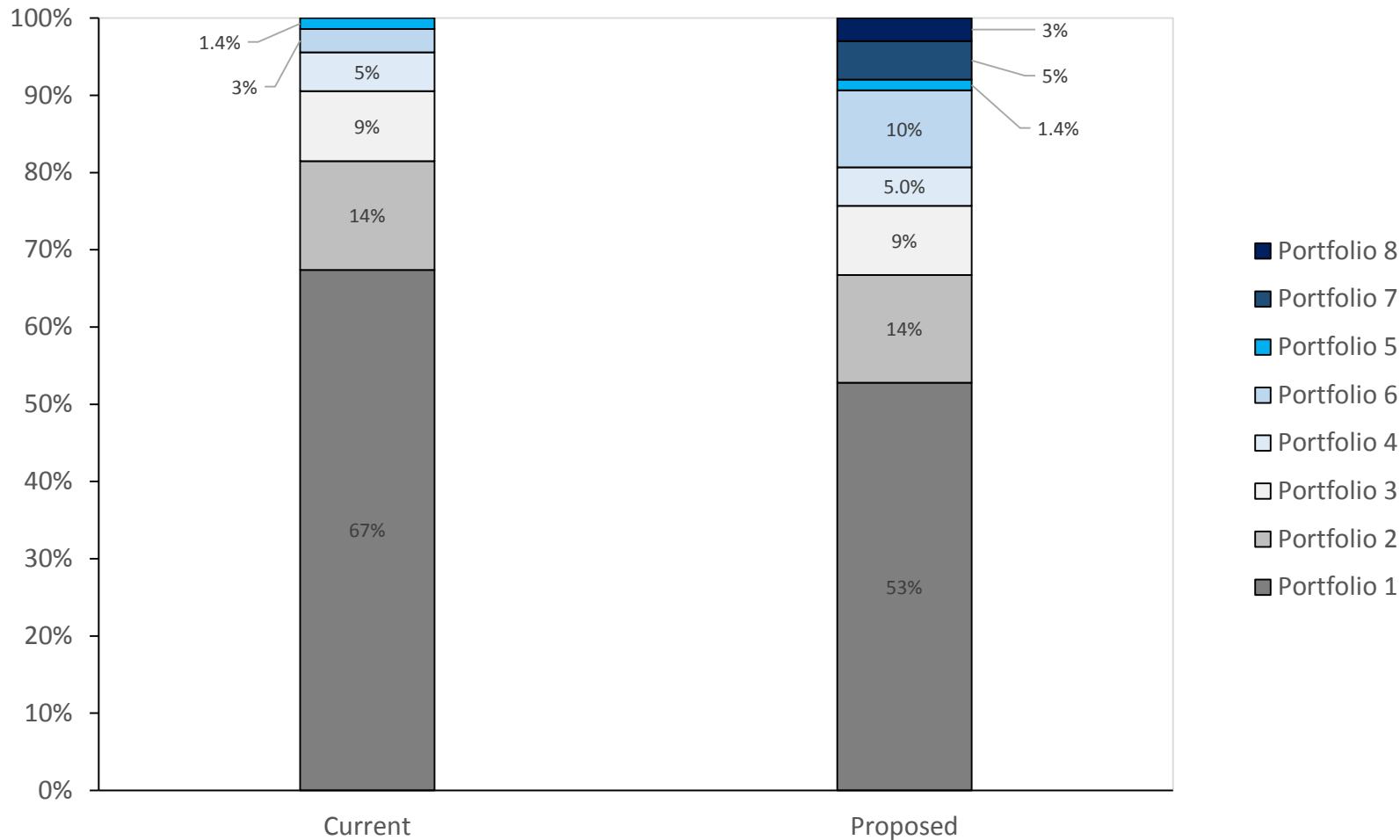
Interest in investing equities has increased in recent years.



Source: HSBC Reserve Management Trends 2017

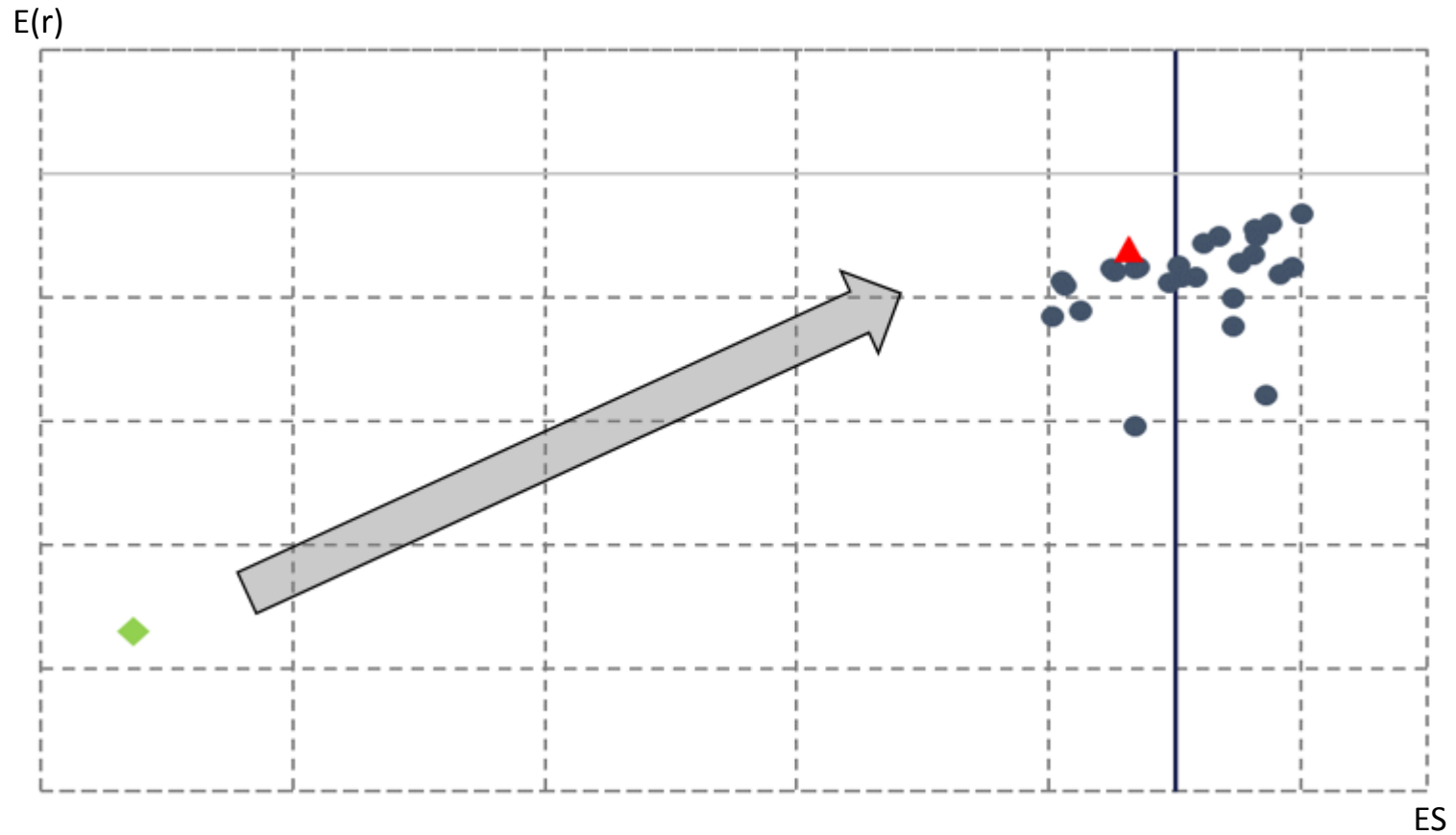


Proposed portfolio structure - 15% shift in SAA





The new strategic benchmark offers a significant improvement in the risk-return profile





Thank you,
Q&A



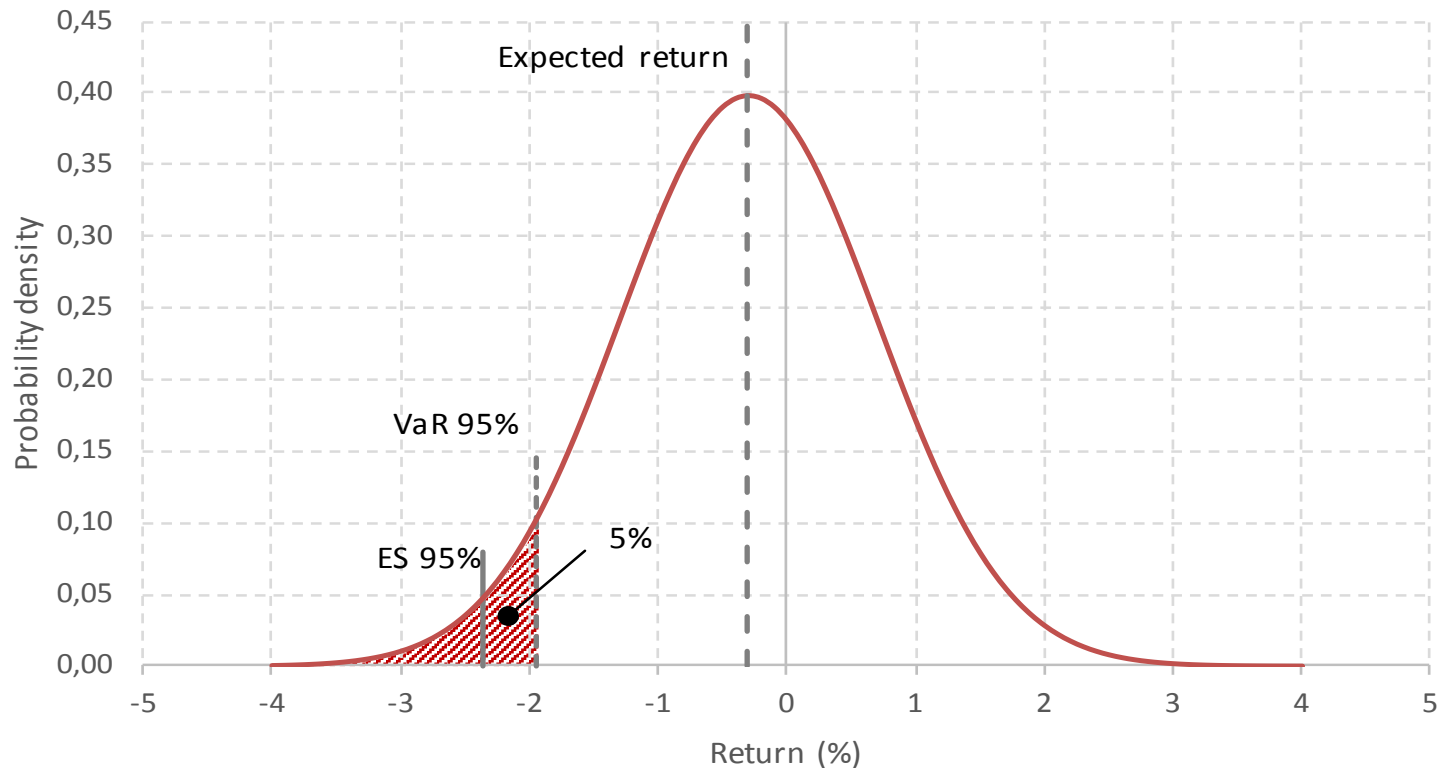
Appendix



The selected risk measure: Expected Shortfall

- ES interpretation: calculates the average of the losses that occur beyond the cutoff point.
- Estimates the losses exceeding VaR, i.e. If things get bad, what is the estimated loss?

Illustration of VaR and ES



**NEGATIVE EURO AREA INTEREST RATED AND
SPILLOVERS ON WESTERN BALKAN CENTRAL BANK
POLICIES AND INSTRUMENTS
4 – 5 MAY 2017**

**Reserve management challenge:
Stability vs Return**

Marian Gjermeni
Director of Monetary Operations Department
Bank of Albania

mgjermeni@bankofalbania.org

Tirana, May 2017

Outline

- Reserve management framework
- Trashing structure
- Currency composition
- Risks in reserve management
- Going forward
- Conclusions

Reserve management

“Reserve management is a process that ensures that adequate official public sector foreign assets are readily available to and controlled by the authorities for meeting a defined range of objectives for a country or union.”

Cit. Revised Guidelines for Foreign Exchange Reserve Management (IMF, 2014)

Reserve management objectives

Liquidity

Availability at any time of adequate funds :

- To implement and support monetary and exchange rate policy;
- To safeguard financial stability and cover country needs in times of crises.

Safety

Preservation of reserves by keeping under control in the most prudent way the risks

Return

Subject to the above constraints:

Generate reasonable income in the medium to long term

Portfolio investment from a Central Bank point of view

- Objective,
- Risk tolerance/appetite,
- Legal obstacle,
- Moral risk (public money)

Review of FX Reserve Policy & Holding purposes

- 2016 review of the document: “On the policy and management of foreign exchange reserves”
 - review the objectives for holding reserves
 - revisit the rationale underpinning the currency composition of each tranche, based on their objectives and balance sheet considerations
 - assessing the current risk tolerance in a negative rate environment
- Objective
 - Integrate country weaknesses and vulnerabilities toward financial stability
 - Align to the nature of Albania’s external vulnerabilities
- Holding purposes

The bank maintains reserves for the following purposes:

 - implementing and supporting the monetary policy and the exchange rate policy of the Bank;
 - safeguarding financial stability or covering the country's needs in times of crisis.

Governance framework

Supervisory Board

Setting broad criteria on the strategic objectives and risk constraints



Investment Committee

Translating broad policy criteria into Operational Guidelines and benchmarks



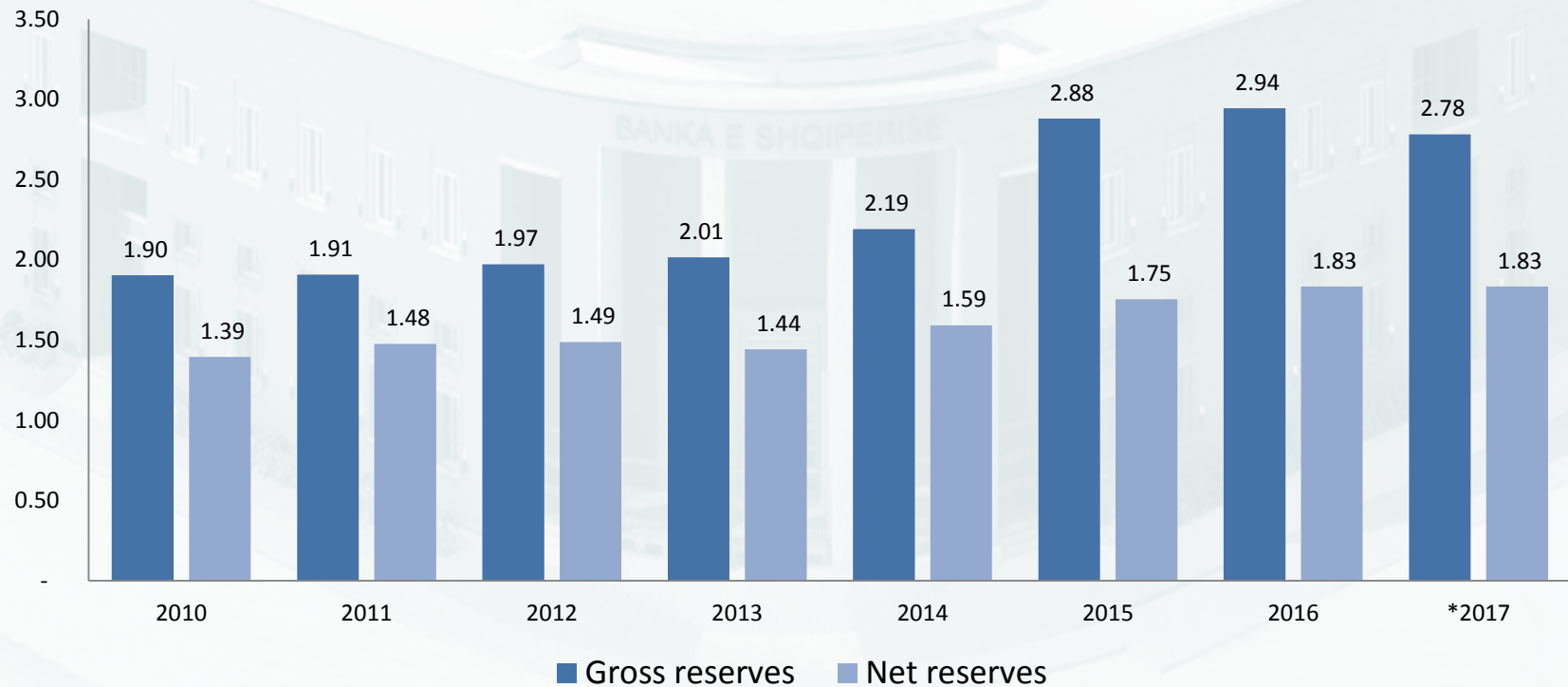
Monetary Operations Department

Distribution of benchmarks, Operational limits and Risk Budgets for active management

Where we are in reserve stock?

- No big changes in risk profile
- No big changes in the utility function of holding purpose/using reserves

BoA Reserves (billion EUR)



*2017 – reserve level as of end of April 2017

Where is the market?

- Buying negative yield - pay for insurance protection
 - Implies negative expected returns for different investment horizons

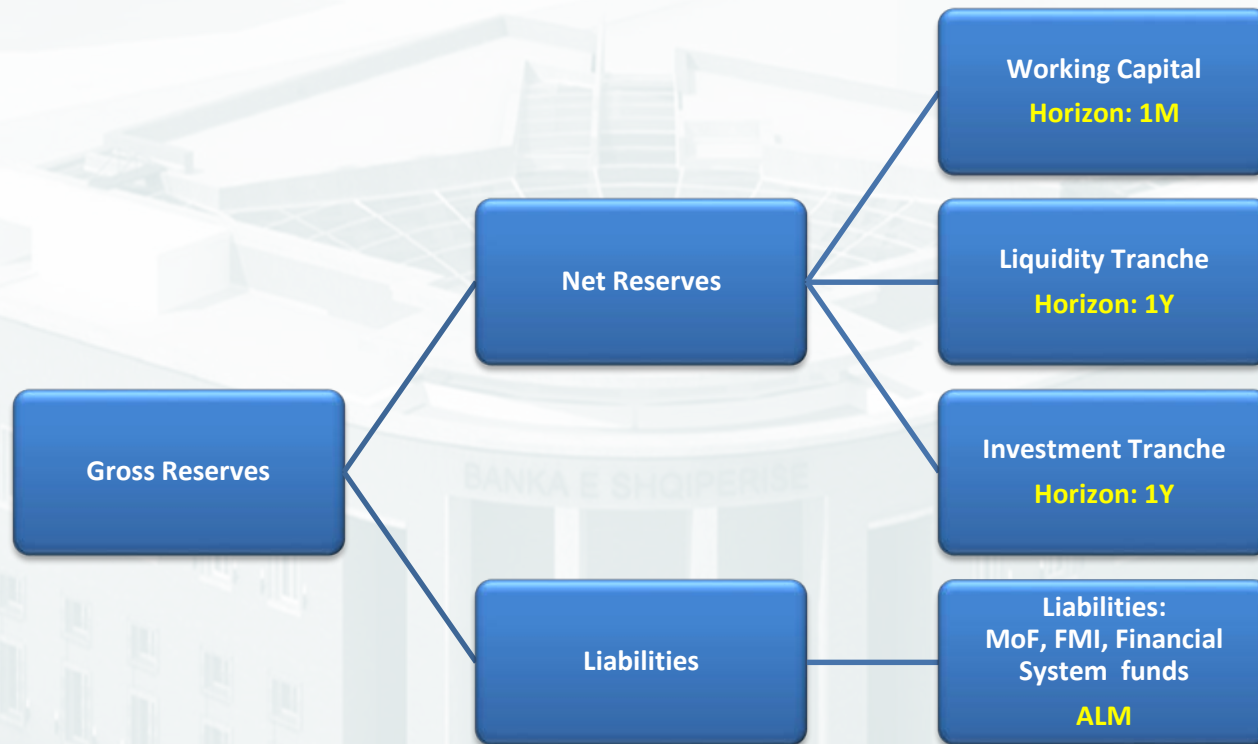


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Reserve Management – Tranching (liquidity risk)



- Tranching structure is underpinning liquidity needs
- Tranching based on liabilities & macroeconomic factors:
 - Projected reserve outflow
 - Trade balance and flows,
 - Months of imports
 - Liabilities: IMF, MoF funds, Financial System Liabilities

Reserve Management – Tranching Criteria

Liabilities tranche

- Size and Currency depending on BoA's liabilities (MoF, FMI, Financial system funds)
 - Financial Stability
 - Country specific vulnerabilities

Working Capital tranche

- Covers predicted needs within 1 month horizon
 - Reserve outflows within 1 month
 - Monthly current account deficit

Liquidity Tranche

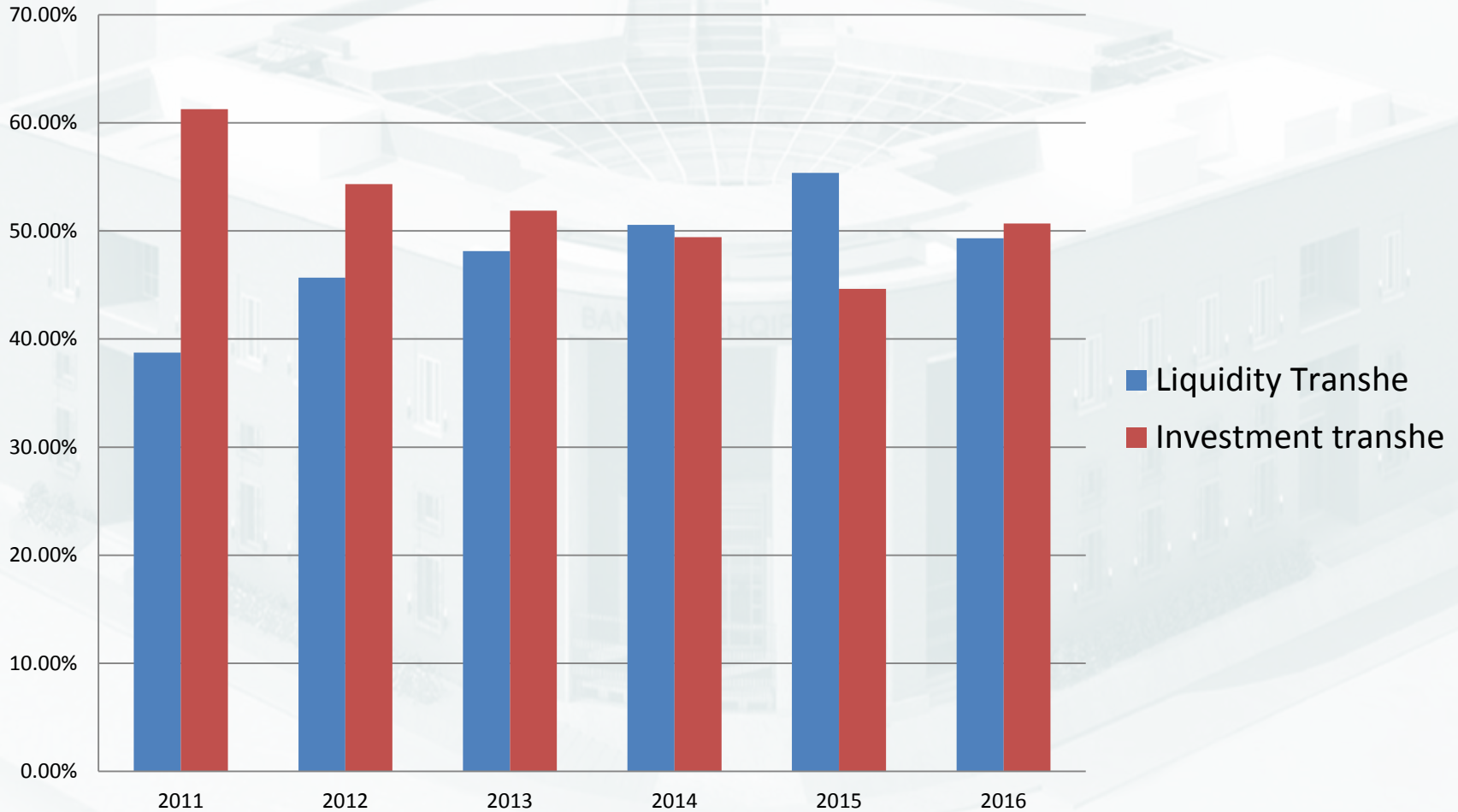
- Investment Horizon 1 Year – Fundamental country vulnerabilities and potential sudden stops
 - Coverage of 3-months of imports

Investment Transhe

- Excess reserve
- Covers unpredicted needs - Investment Horizon 1 Year

Trend in tranche distribution

Tranching structure trends



FX rate fixed at 31.12.2011

Reserve Management - Currencies

- Currencies



- Euro accounts for more than 50% of the reserves
- Currency composition reflects currency needs within the investment horizon and diversification benefit
 - Does not reflect government FX liabilities - Government responsible for its currency needs
- Currency distribution per tranche based on:
 - Foreign currency liabilities
 - Imports
 - SDR basket and other currencies for diversification purposes (investment tranche)
- No active management on currency exposure

Currency Diversification

RMB ✓

RMB internationalization and inclusion in the SDR basket

- After a detailed analysis and evaluation BoA includes RMB in its reserves
- % of the RMB held in the reserves differs from the one in the SDR
- BoA creates the infrastructure and starts investing

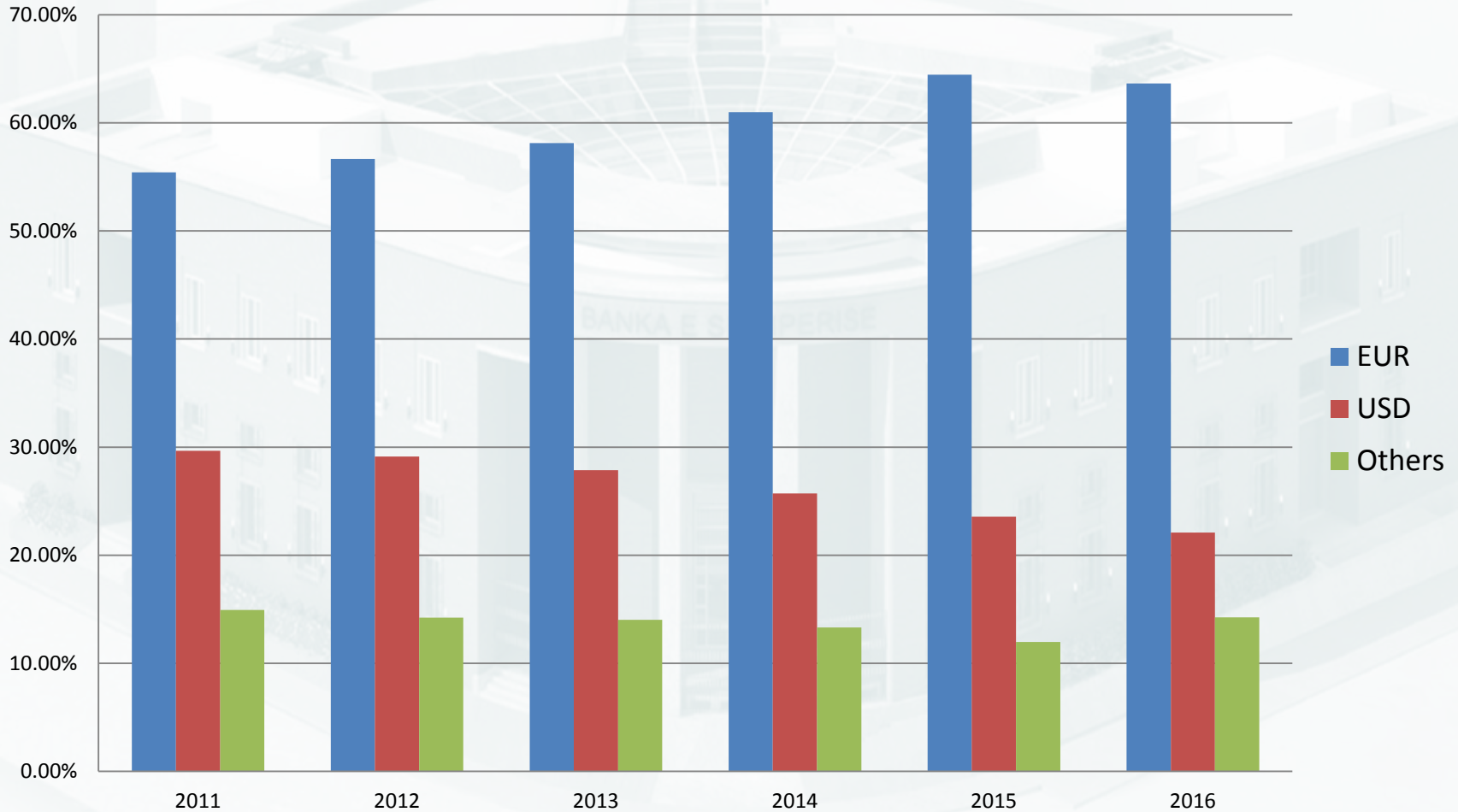
AUD ✓

Currency diversification

- AUD included in BoA's reserve
- BoA creates the infrastructure and starts investing

Trend in currency composition

Reserve Currency Composition Trends



FX rate fixed at 31.12.2011

Reserve Management – Interest rate

- Risk tolerance
 - Strategic duration is defined by maximizing returns given the risk tolerance imposed by the Supervisory Board
 - Investment horizon 1 year
 - VaR 99%
- Active management on interest rate exposure



Market Risk with negative interest rates

- Diversified benchmarks
 - From a single country benchmark approach to a multi-country benchmark
- Calibrating market risk for negative interest rates reserve currencies – increasing budget risk
 - Risk on negative or zero interest rate currencies may be adjusted
- Cash is king
 - Including cash in benchmarks (Euro)
 - Better performance in normalizing interest rate
- HTM strategies
 - Limitations from the 1 year accounting horizon of the institution
 - Limitations in active management performance

Reserve management - Credit Risk

- 2013 increasing Credit Risk appetite coupled with strengthening of internal credit risk models
- Eurozone Governments up to BBB-
 - 2015 no exposure to EZ BBB- Governments in benchmark
 - 2013 – 2015 positive outcome of the strategy

	Low risk									High risk						
Governments/Central Bans	AAA	AA+	AA	AA-	A+	A	A-	BBB+	BBB	BBB-	BB+	BB	BB-	B+	B	B-
Government Agencies or other Sovereign authorities	AAA	AA+	AA	AA-	A+	A	A-	BBB+	BBB	BBB-	BB+	BB	BB-	B+	B	B-
Multilateral Institutions	AAA	AA+	AA	AA-	A+	A	A-	BBB+	BBB	BBB-	BB+	BB	BB-	B+	B	B-
Public Organ/Munies/Local Government	AAA	AA+	AA	AA-	A+	A	A-	BBB+	BBB	BBB-	BB+	BB	BB-	B+	B	B-
Banks and other financial Institutions	AAA	AA+	AA	AA-	A+	A	A-	BBB+	BBB	BBB-	BB+	BB	BB-	B+	B	B-

 Minimal rating
 Eurozone Governments

Reserve management – Other risks

A more comprehensive management of risks during the reserve management process also includes:

- Custodial risk – refers to losses from assets under custody in case of inadequate practices for portfolio maintenance by the custodian
- Settlement risk – refers to losses arising due to inadequate settlement procedures. Both custodial and settlement risks are managed with the support of the Payments Systems & Accounting Finance Department
- Legal risk – refers to losses arising from contracts that are not legally enforceable/appropriately documented. Is managed with the support of the Legal Department

Eligible Asset Classes

- Bonds, bills, notes
- Time deposit, CD, CP
- Futures & forwards
- Other fixed income tradable obligation
- Repo, reverse repo

Going Forward

- Covered Bonds as an eligible asset class
 - by year end we expect to have all set to start investing
- Negotiation of REPO/Stand By Credit Facility
 - to eventually serve government needs/hedge
 - allow for an optimization of the tranching structure
- Review of SAA and more
 - Multicurrency approach
 - Investment horizon of the tranches
 - HTM strategies vs high IR of Portfolio Managers

Conclusions

- Close ties to Eurozone impose us to maintain a high share FX assets in Euro to fulfill the purposes for which the reserves are held
 - Country specific vulnerabilities
 - Macroeconomic factors
 - Trade relationship
- Stringent regulatory framework caused high burden to counterparty relationship and has narrowed the possible reserve management strategies
 - Increased counterparty maintenance cost
 - Difficult to widen the scope of collaboration
- Low interest rates environment has limited the effectiveness of the reserve management strategies adopted from BoA
 - Need that ECB implement measures not to harm Central Banks that are obliged keep Euro in their reserves/portfolios

Conclusions

- BoA response encompasses a multi dimensional approach towards different types of strategies - conscious of the low risk profile of the institution
 - Increasing number of counterparties/widening Credit Risk
 - New instruments (Covered Forwards/Futures)/Products (securities lending)
 - Diversified Benchmarks / Currency diversification
 - Calibrating market risk for Negative interest rates reserve currencies
 - SAA review and optimization of the trashing structure of the reserves
- On the other side – Euro negative rates resulted a contributing factor to the financial stability
 - Banking system have less incentives to keep Euro
 - Contributes to de-euroization and improvement in the Monetary policy transition channels
- ...but given country specific fundamentals and country vulnerabilities, there is hardly more to do without compromising stability

A light blue architectural rendering of a modern building. The building features a curved facade and a central glass atrium with a grid pattern. The text "Thank You!" is overlaid in the center of the image.

Thank You!

FX reserves management in negative rates environment:

The Macedonian experience

A decorative horizontal banner with a yellow background. It features faint, stylized images of historical figures and financial documents, including what appears to be a portrait of a woman and some architectural or historical scenes.

Vesna Hristovska
Financial Market Operations Department
National Bank of the Republic of Macedonia

Tirana, May 2017



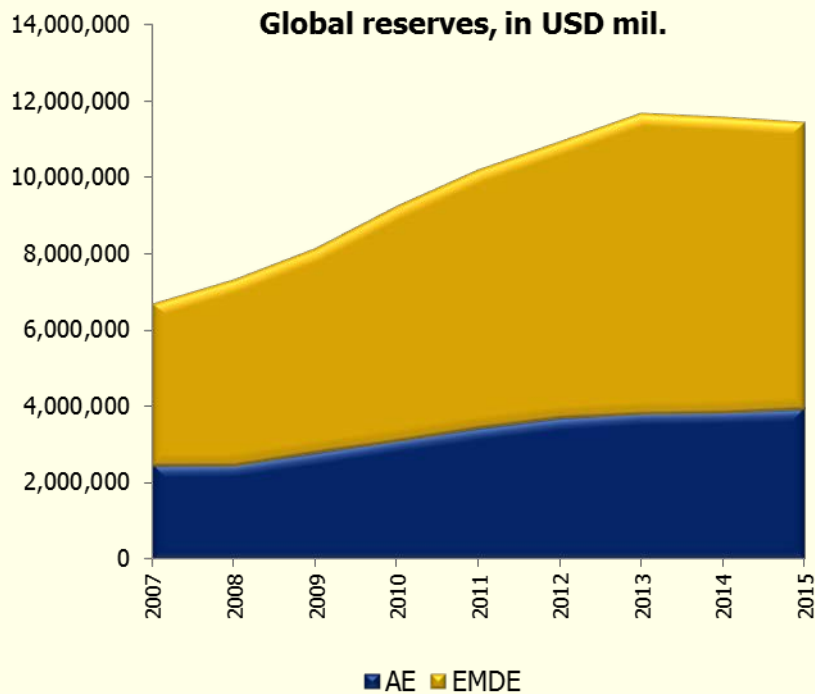
FX reserves management – Global trends

FX reserves management

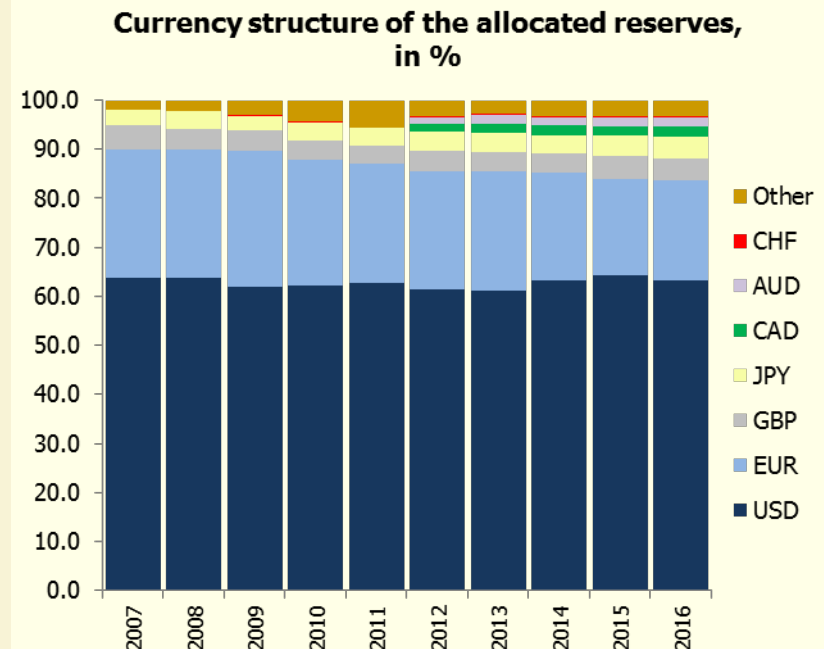
Global trends

Over the last two decades, on the back of growing FX reserves, central banks have positioned themselves as influential investors on the global financial market

US dollar remains dominant FX reserves currency, followed by EUR, while diversification towards other currencies is visible in recent years



Source: IMF data



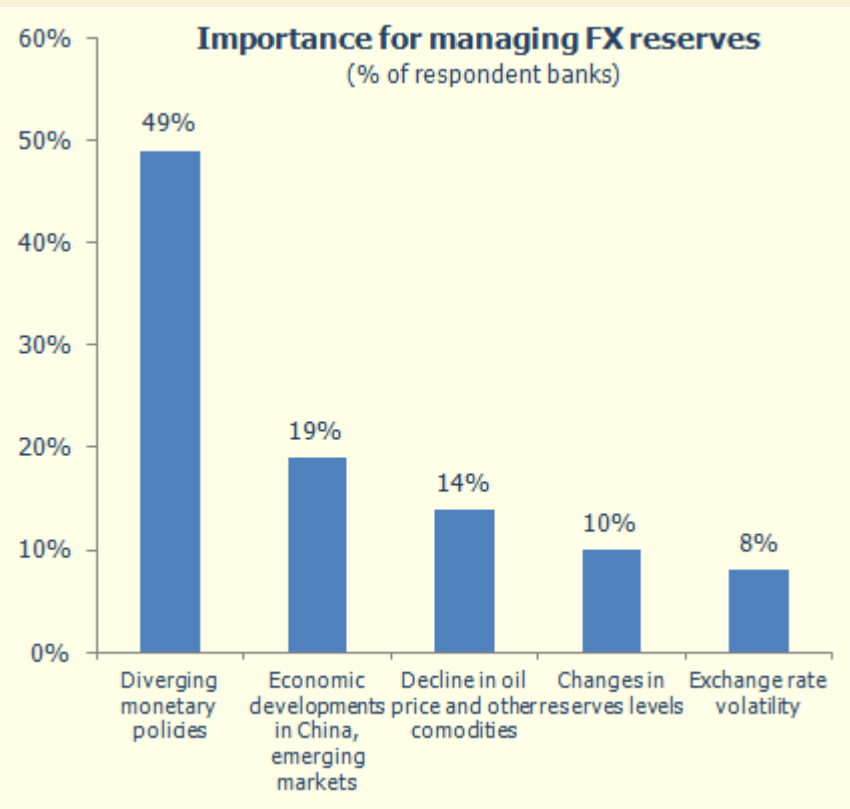
Source: IMF data

FX reserves management

Global trends

Diverging monetary policies between major banks - important concern of central banks when managing FX reserves....

...thus the persistence of negative rates in some major reserve currencies has provoked many central banks to introduce changes to their portfolio management



Changes to portfolio management

Portfolio

Reduced allocations to Euro, Yen, Swiss franc.

Extended duration; increased exposure to credit risk

Broader diversification – investment in corporate bonds, equities

Investment behavior

Search for yields – capital preservation

Higher risk tolerance

Changes in the investment horizon

Diversification across and within asset classes



FX reserves management – the Macedonian experience

FX reserves management Macedonia

Purposes of FX reserves holdings

- ❖ **Monetary policy purpose:**
 - Support exchange rate regime
 - Intervene in the FX market

- ❖ **Precautionary objectives (insurance against shocks):**
 - Buffer against balance of payments shocks
 - Investor confidence in the country's ability to meet FX obligations, lower probability of financial crises, and reduce cost of external funding
 - Confidence in the national currency
 - Emergency liquidity assistance to banking sector, in case of market disruptions
 - Funds in case of national disasters and emergencies

- ❖ **Non-precautionary objectives**
 - ☐ Generate income to cover operational costs (insure Central Bank independence)
 - ☐ Preserve wealth for future generations

Investment principles/objectives

- ❖ **Safety** - Capital preservation

- ❖ **Liquidity** - Liquidity provision

- ❖ **Profitability** – Income generation

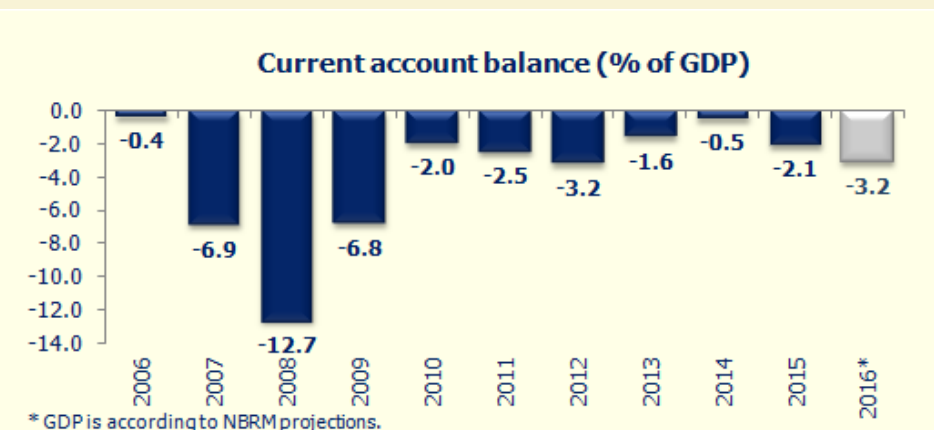
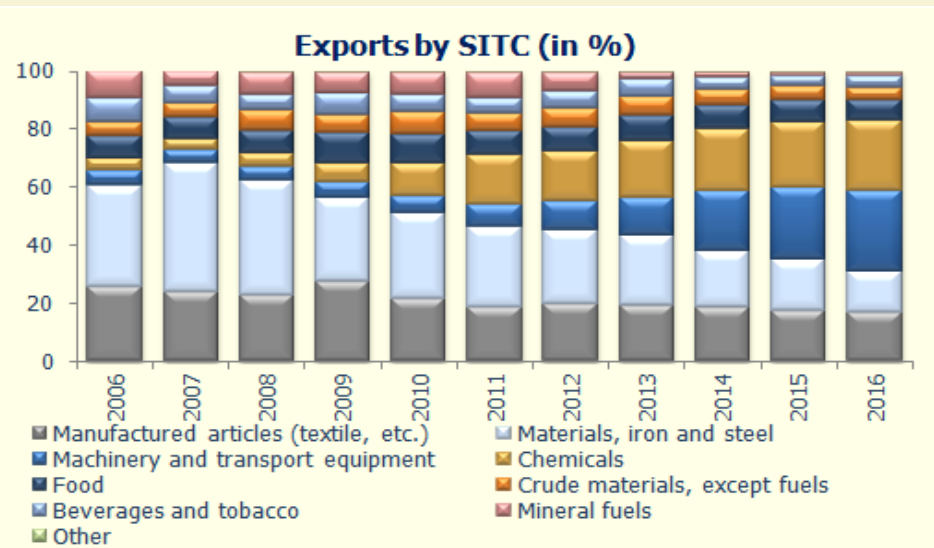
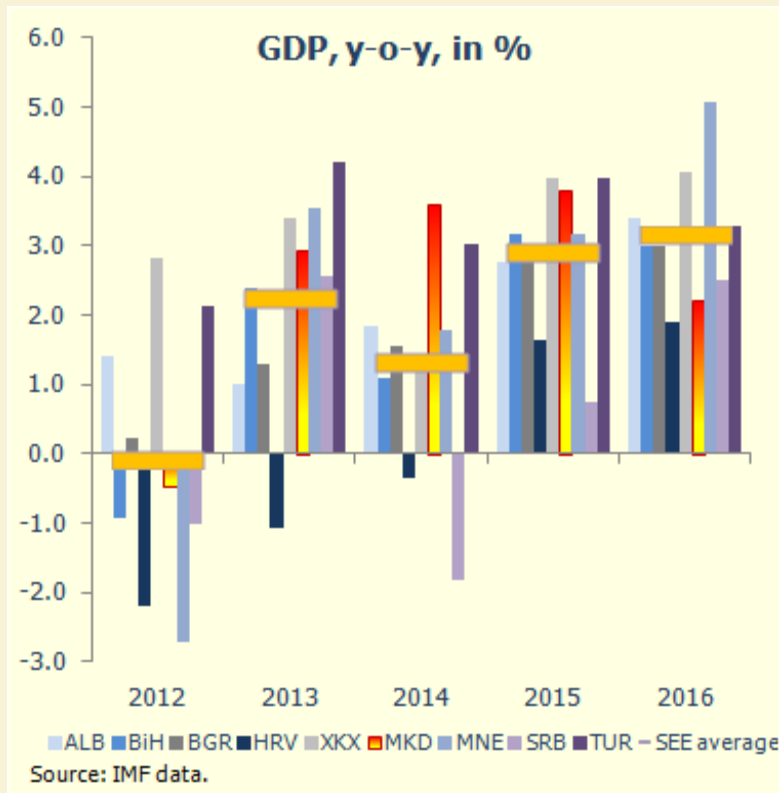
Determined by country's relevant characteristics and exposure to external vulnerabilities

FX reserves management Macedonia

Country's profile – small, open economy with exchange rate commitment to EUR

Growing steadily over the last couple of years despite several external and internal shocks...

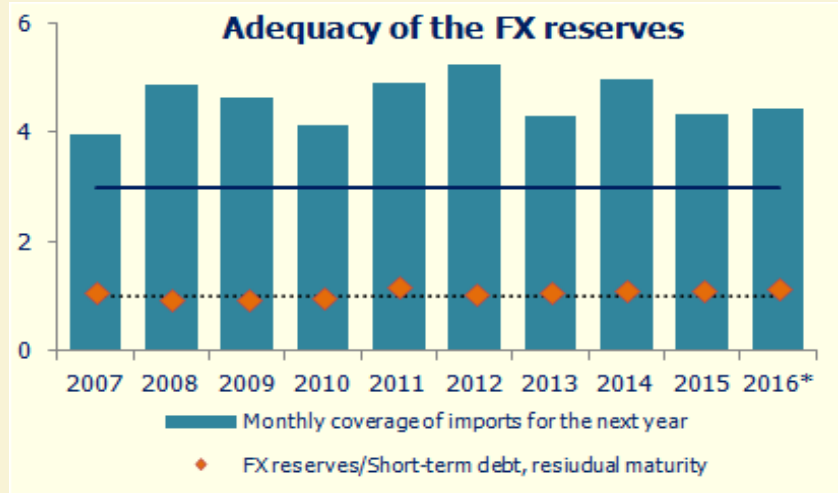
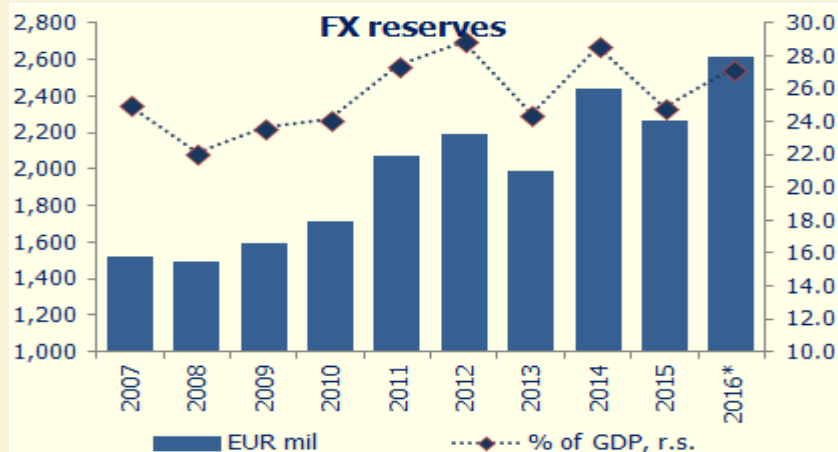
...supported by structural changes in the economy that encouraged FDI entrants with effect on export diversification and CA deficit...



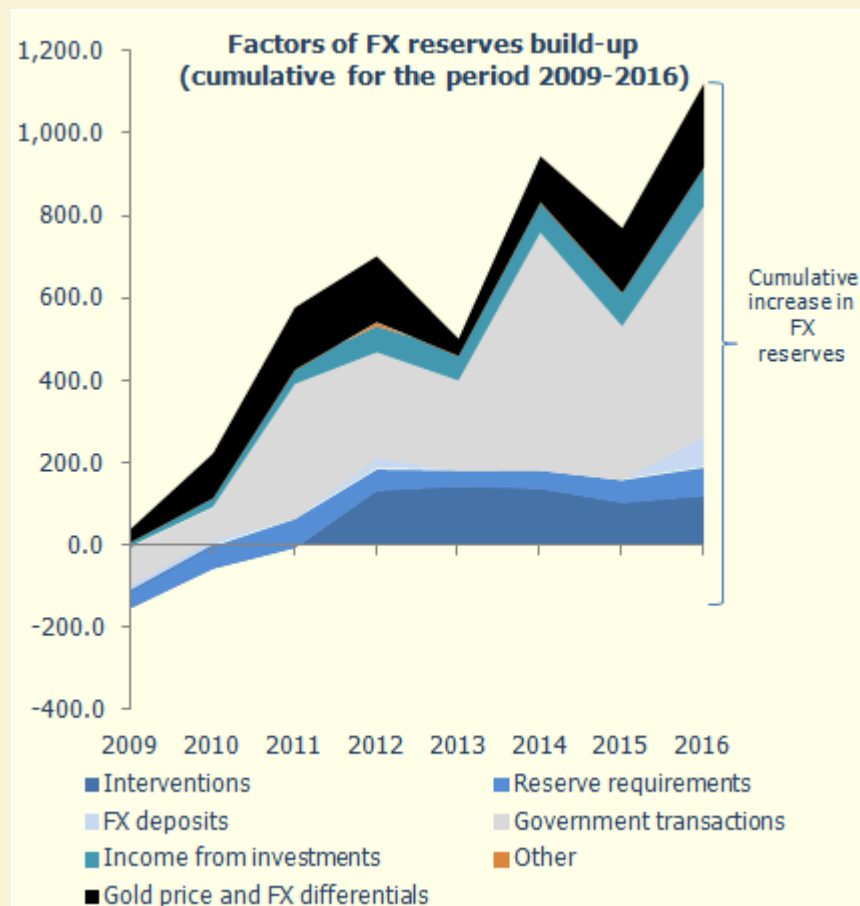
FX reserves management Macedonia

FX reserves on a generally growing path

- Increased by 1.7 times in absolute terms as compared to the pre crisis-level (2008) and are constantly maintained at adequate level



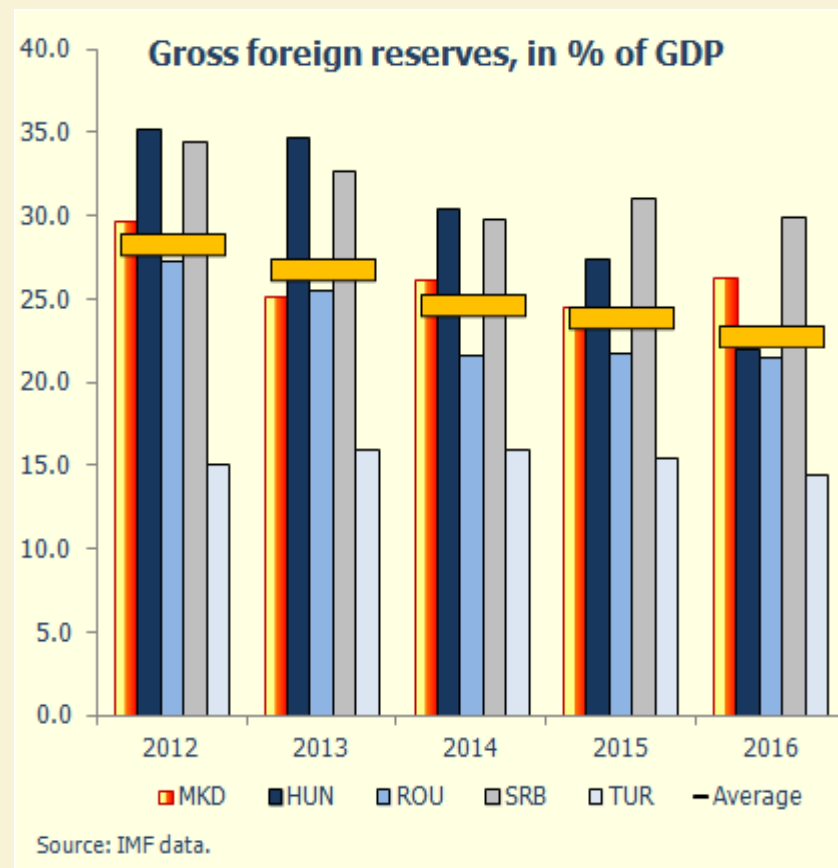
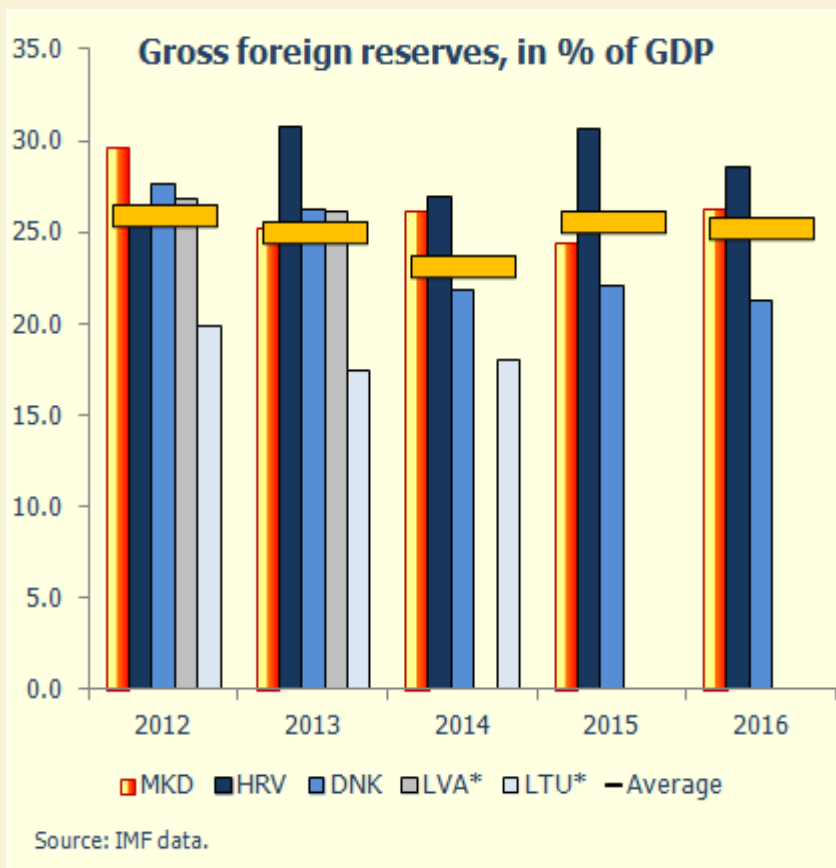
Government transactions leading contributor to the reserves build-up, with NBRM FX interventions also being an important factor



FX reserves management Macedonia

Macedonian FX reserves around the average of the countries with ER commitment

- In line with the average of countries from the region



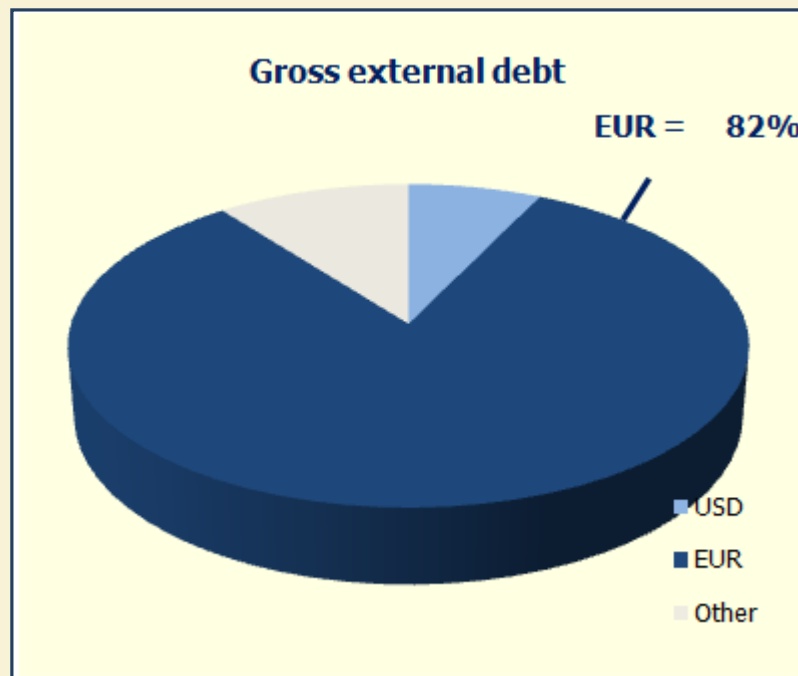
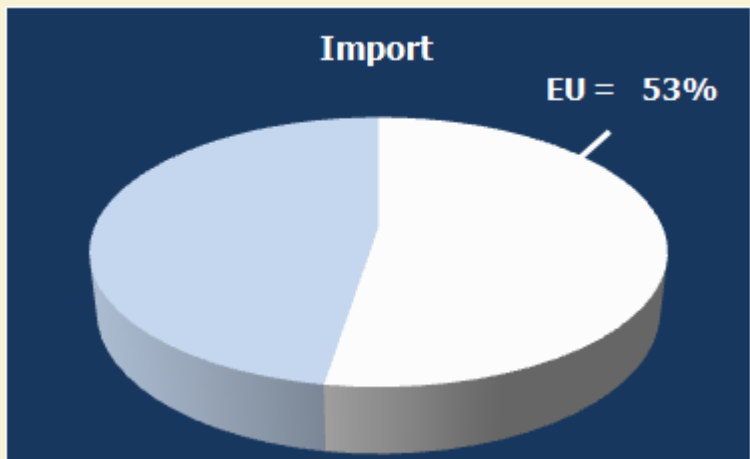
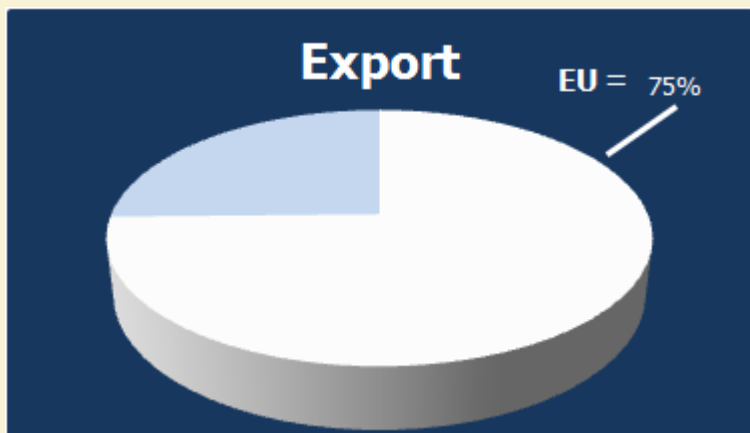
*Latvia joined the Euro in 2014; Lithuania in 2015.

FX reserves management Macedonia

- Exchange rate regime / currency of intervention
- Currency structure of trade
- Currency composition of external debt



important factors of FX reserves currency composition and tranching



FX reserves management Macedonia

Changing environment and low yields in long period urge for strategic orientation towards changes in portfolio management



Markets

- Insufficient compensation of risk
- Low and negative rates
- Compressed spreads
- Diverging monetary policies
- Market disturbances due to political risk

Portfolio changes

- Currency diversification
- Extended duration
- Increased credit exposure
- Added new instruments within asset classes
- Added new issuers
- HTM portfolios
- Increased active portfolio management

Investment Behavior

- Search for yield
- Increase in risk tolerance (market & credit)
- Extending the scope of eligible assets in are of FI instruments

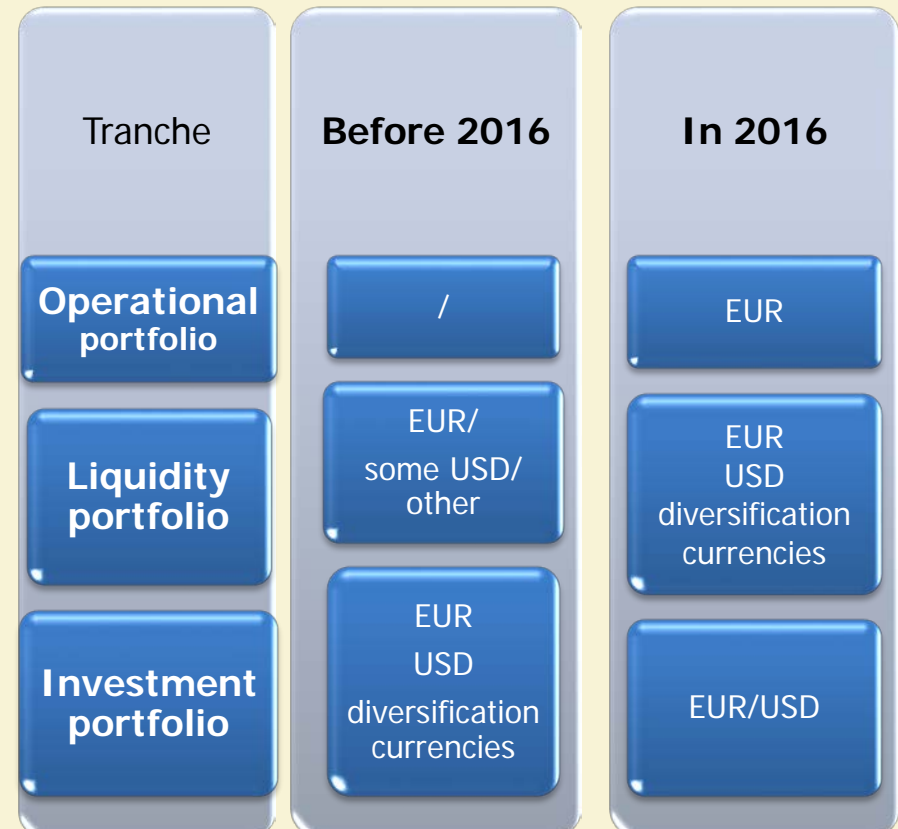
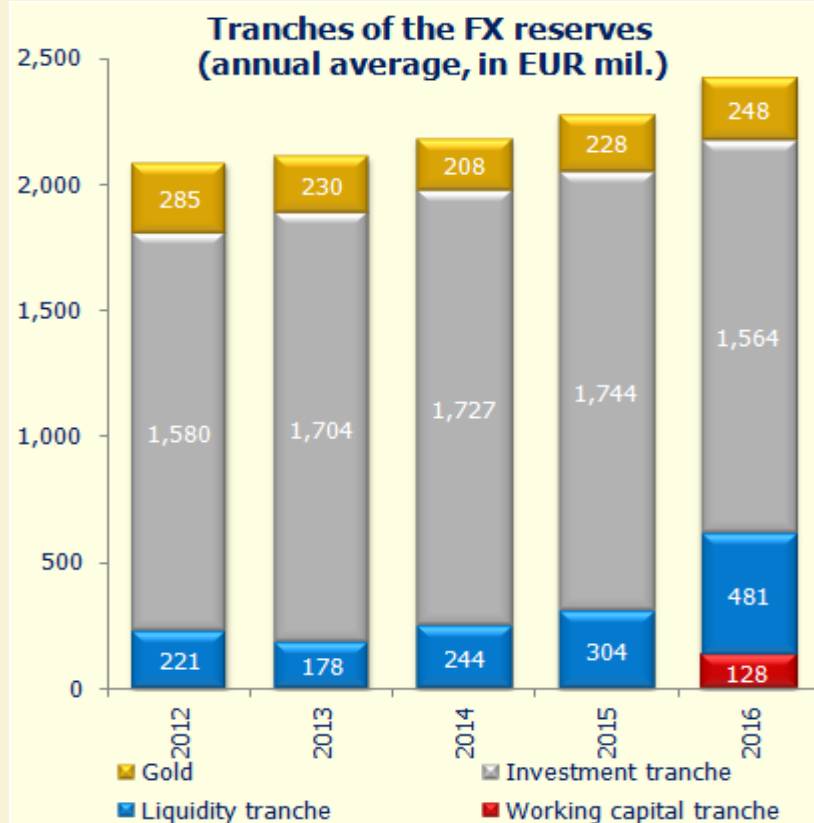
FX reserves management Macedonia

Liquidity objective important in tranching FX reserves

- Sufficient level of liquidity to meet sudden demand (FX interventions) and regular servicing of Government's debt obligations
- new portfolio in 2016 – **working capital**

Portfolio currency structure determined by the objective of liquidity

- **Operational portfolio (Working capital)** – predominantly current accounts (accepting negative interest rates)
- **Other portfolios** – no investments with negative yields (at the time of investment)

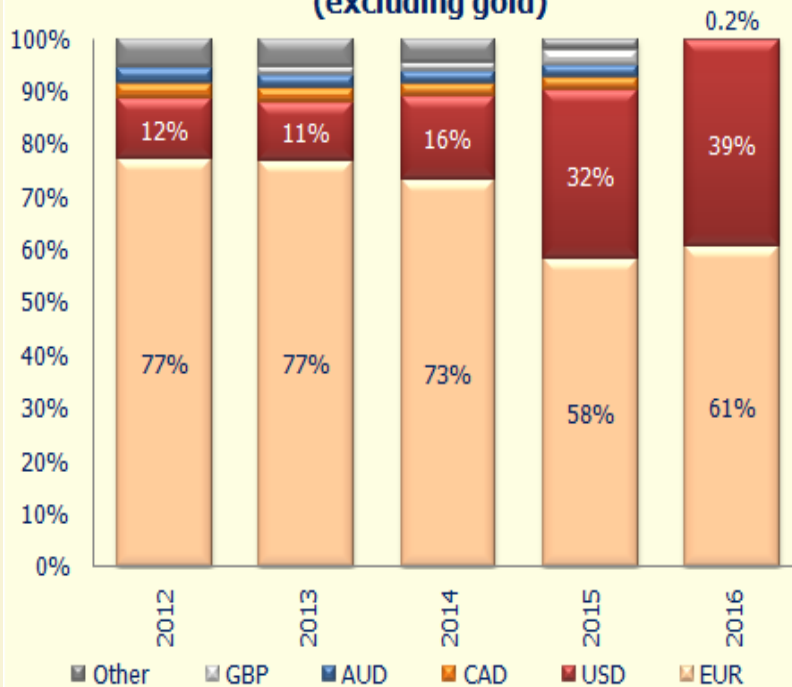


FX reserves management Macedonia

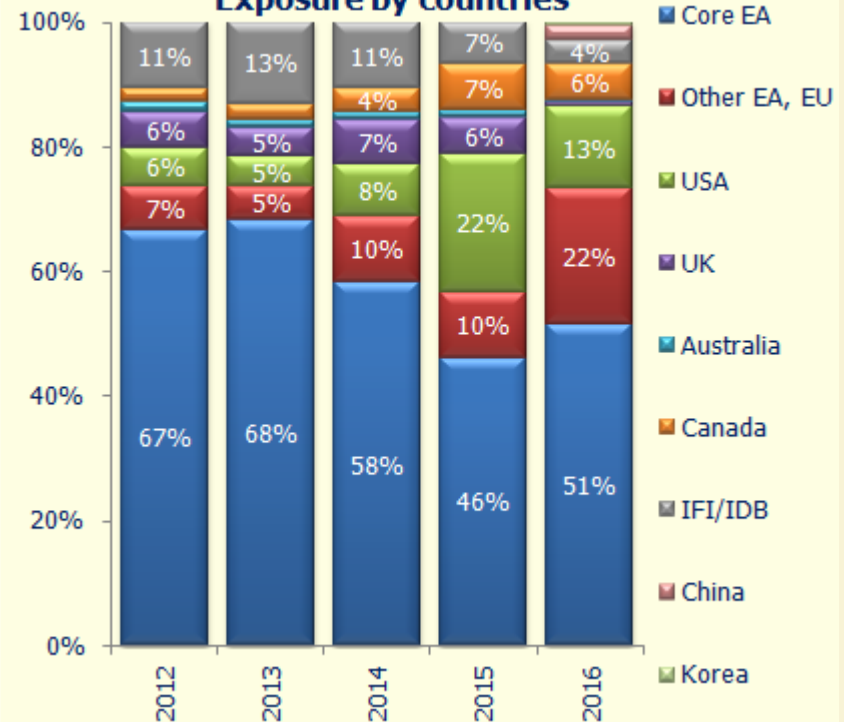
- Euro is dominant reserve currency
- Higher tactical unhedged exposure towards USD starting 2014
 - Capital preservation in terms of negative yields on EUR assets
 - Higher return due to higher US rates

As Euro is main intervention currency, most of investments are in EA countries
but to avoid negative yield investments, part of funds are invested in other EU countries as well

**Currency composition of the FX reserves
(excluding gold)**



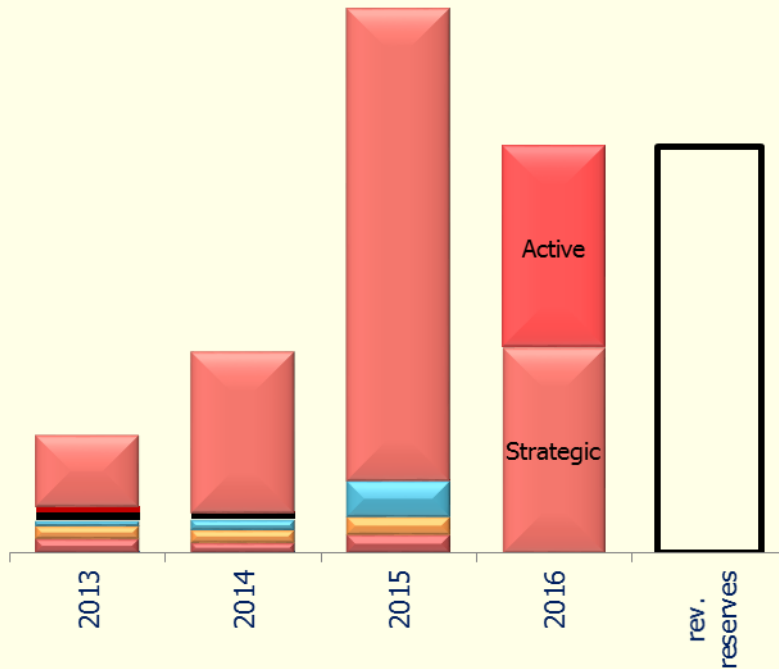
Exposure by countries



FX reserves management Macedonia

Higher currency risk exposure starting 2014, but slightly decreasing the currency risk in 2016 with the introduction of the currency risk budget.

Value at risk (95%, 1 year horizon)



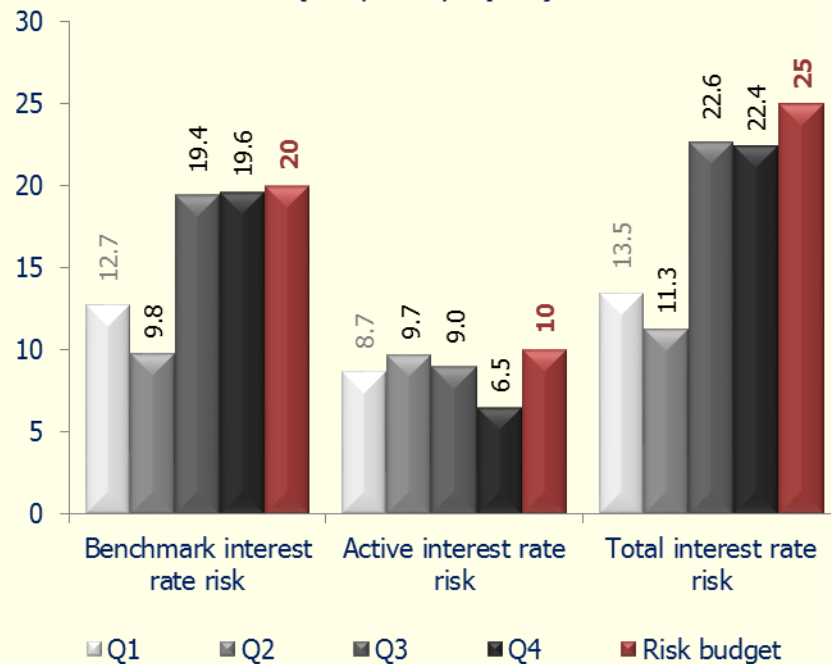
Activities for currency risk management enhancement:

- Define explicit measure of currency risk (VaR, 95%, 1 year horizon)
- Setting currency risk budget (accumulated revaluation reserves)
- Defining strategic currency structure
- Defining tactical currency structure (deviations from the strategic structure constrained with the currency risk budget)
- Reclassification of the unhedged commodity currencies' portfolios from strategic to tactical (greater flexibility)

FX reserves management Macedonia

Extended duration in the process of avoiding negative yields, hence higher interest rate risk. Increased credit exposure allowed for some decrease in the active interest rate exposure (Q4 2016).

**Interest rate risk exposure in 2016
(VaR, 95%, 1 year)**



Activities for interest rate risk management enhancement:

- Formal process of strategic asset allocation
- Introducing a risk budget (strategic and active)
- Higher tolerance for active positions (3 months duration)
- Interest rate risk decomposition (yield, spread and by key rate/region/instrument)
- Monthly review of the risk decomposition (Front Office and Risk Management)

In preparation: Process of risk allocation to specific active positions

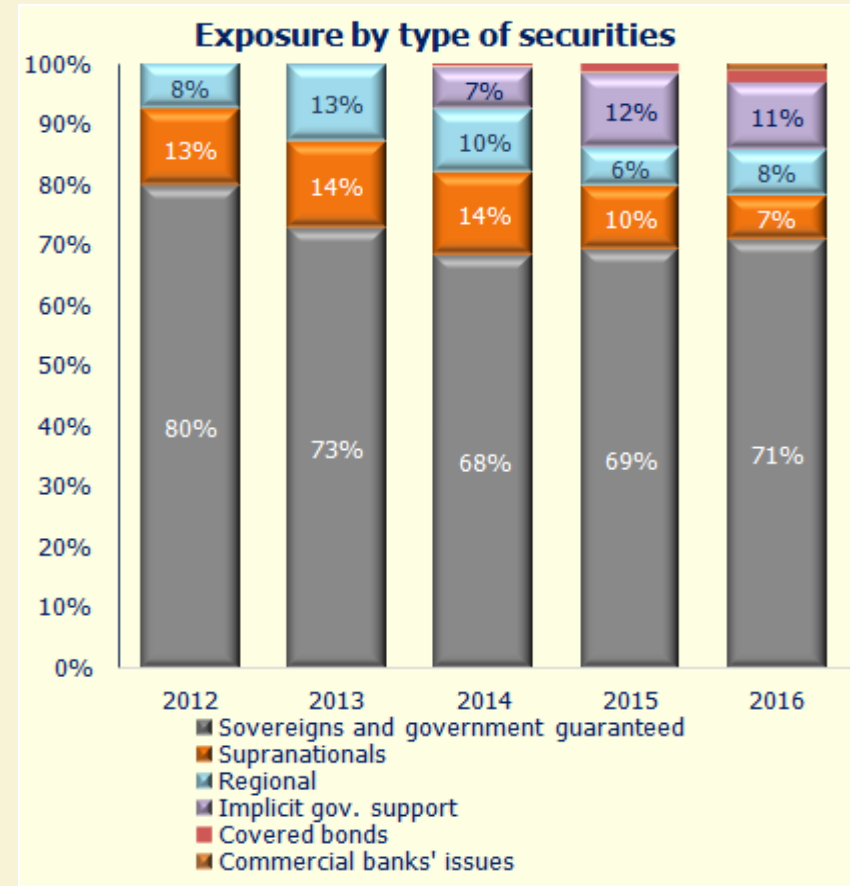
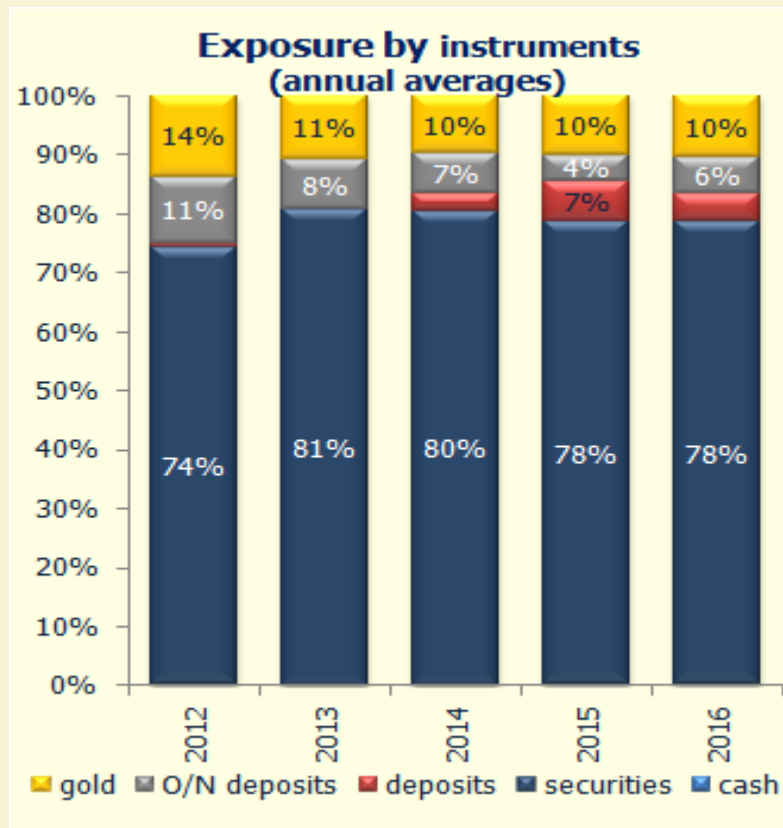
FX reserves management Macedonia

The structure of FX reserves is rather conservative

- Around 80% is allocated in FI assets
- Investments in gold and deposits

Diversification within asset class in recent years in search for yield

- In 2016 placements in money market instruments (commercial paper and certificate of deposits) as response to rising yields

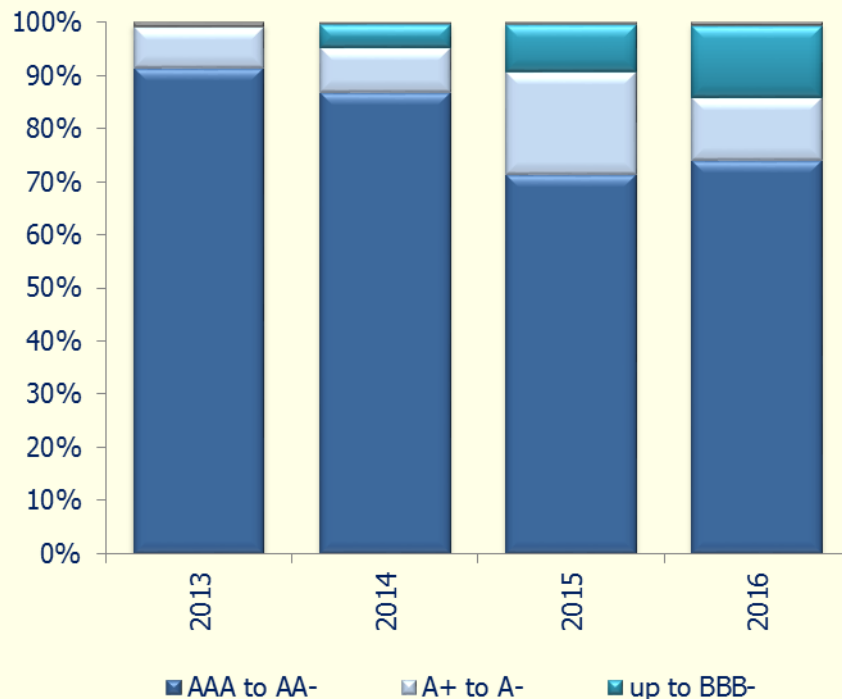


FX reserves management Macedonia

Increased credit exposure by:

- introducing investments to EA periphery
- larger exposure to commercial banks (deposits, certificates of deposits, commercial papers and financials' corporate bonds)

Credit risk exposure



Activities for credit risk management enhancement:

- Introducing and updating Credit notebooks
- Regular quarterly review of the countries' macroeconomic indicators
- Regular quarterly review of the banks with bigger exposure
- Emphasis on banks' financial indicators
- Riskier investments only in Basel III compliant banks

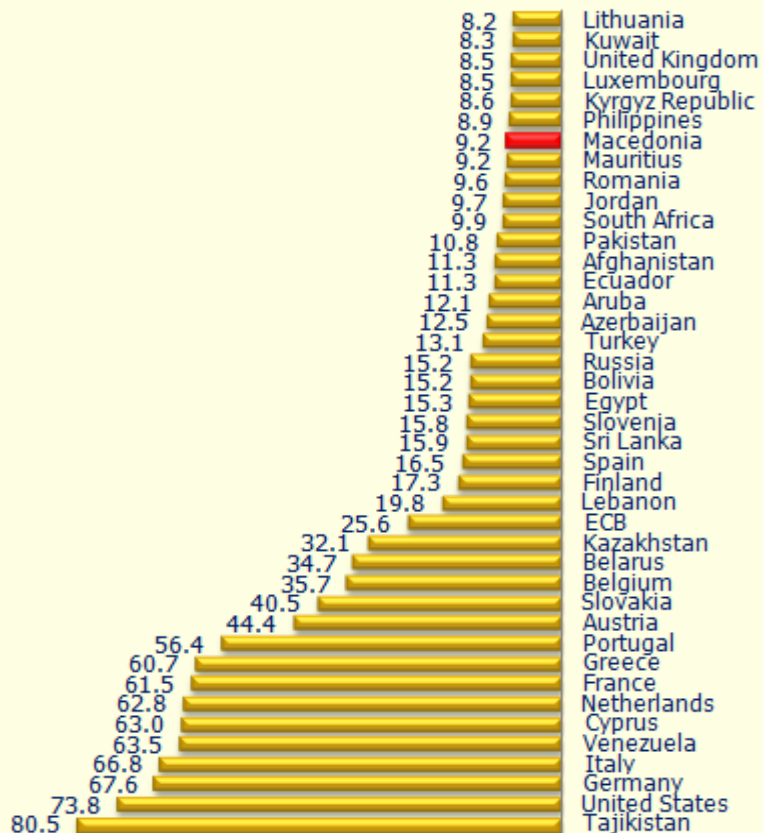
In preparation: Credit risk quantification and budgeting

FX reserves management Macedonia

Gold holdings with constant share in FX reserves
(in terms of quantities)

- Strategic orientation
- Held in allocated gold accounts at highest rated banks

Gold holdings in the FX reserves (%)



Additional activities for capital preservation through higher income generation:

- Active management
- Active positions in other currencies
- Securities lending (simultaneous repo and reverse repo transactions)
- Automatic lending of securities
- Revision of settlement and custody costs

In preparation: Financial derivatives (Interest rates futures)

Challenges ahead

❖ Divergent monetary policies

ECB tapering – when and with what speed

USA: Uncertainty surrounding the policy stance of the new US administration and its global ramifications

❖ How will Europe and UK handle Brexit

❖ Protectionist pressures, geopolitical risks, refugees and migrants crisis

❖ Europe: Many question marks, too little positive impulses

- Dense political calendar
- Multi-speed Europe – towards a more united or more divided Europe?

2017

- 7 May - French Presidential election (second round)
- June 2017* - French parliamentary election
- By the autumn - Possible early Italian election (deadline is May 2018)
- 24 September - German federal election
- October 2017* - Czech legislative election, Luxembourg legislative election

2018 and beyond

- February 2018* - Cyprus presidential election
- April 2018* - Hungarian parliamentary election
- May 2018* - Deadline for Italian general election
- June 2018* - Maltese general election
- September 2018* - Swedish general election
- March 2019* - Estonian parliamentary election
- April 2019* - Finnish parliamentary election
- May 2019* - Belgian federal election October
- 2019* - Greek legislative election
- May 2020 - UK general election
- April 2021* - Irish general election

• Note:* Elections to be held at this date at the latest

Challenges ahead

- ❖ Fundamental decision in FX reserve management is proper asset allocation
 - but, this is constrained by country specific factors (FX rate regime, reserves volume, countries liabilities)

- ❖ Low yielding environment forced reserve managers to employ diversification
 - NBRM undertook currency as well as asset diversification, but limited in scope

- ❖ FX reserves are increasing, but at same time liability side of the balance sheet of NBRM is creating additional requirements for FX reserve management

- ❖ NBRM dedicated in ensuring implementation of best practices in FX reserve management process, but at same time explore possibilities for diversification in new asset classes

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