# Challenges of Debt Sustainability during Political Transition in North Africa Countries

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April 6-7, 2014

MULTILATERAL DEVELOPMENT BANKS' MEETING ON DEBT ISSUES
The World Bank, Washington, DC
F 5P-100 (IFC Building, 2121 Pennsylvania Avenue, NW)

# Challenges of Debt Sustainability during Political Transition

- Introduction
- Challenges of Debt during transition
- Debt  Sustainability Risks
- Case Study: Tunisia & Morocco

# Linking Political Transition and Debt Sustainability?

- Recession/ Negative Output Gap
- Social uprising/ Wage & Regional Development Demands
- Social & Subsidies Expenses increases
- Fiscal Revenue Collection Decreases
- Increase of fiscal deficit
- Security concerns/Capital Flight/Decrease of Tourism
- Depreciation of currency
- Increase of inflation
- **Result: increase fo external and internal borrowing to cover fiscal deficit**

## North Africa Countries in Transition (NACT): An Overview

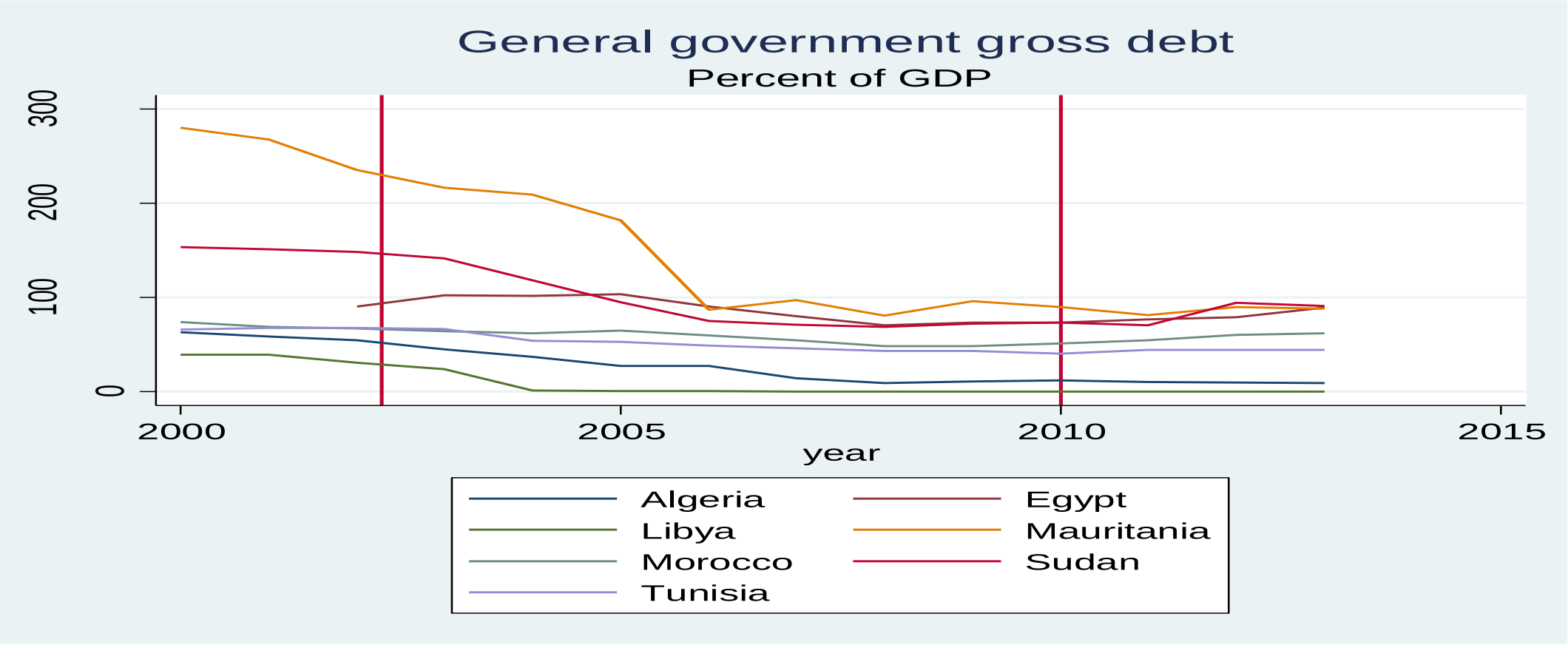
- TUNISIA: starting 17 Decembre 2010 and ends on January 2011
- EGYPT: begins on 25 January 2011 and ends on 11 February 2011
- LIBYA: begins on 15 February 2011 and ends on 20 October 2011
- MOROCCO smoothly transition during 2011

| | Population (Millions) | Population Growth Rate (%) | GDP per capita (Thousands of US $ ) | | GDP Real Growth (%) | | Unemployment rate (In %) | |
|---|---|---|---|---|---|---|---|---|
| | 2012 | 2000-2012 | 2010 | 2013 | 2000-2010 | 2011-2013 | 2000-2010 | 2011-2013 |
| Algeria | 37.5 | 1.7 | 4480.7 | 5448.4 | 3.9 | 3.1 | 17.9 | 10.5 |
| **Egypt** | **82.5** | **2.2** | **2779.7** | **3179.0** | **5.0** | **2.0** | **9.9** | **12.2** |
| **Libya** | **6.0** | **1.3** | **12357.8** | **13580.5** | **4.6** | **21.2*** | | |
| Mauritania | 3.6 | 2.7 | 1017.4 | 1091.6 | 3.7 | 5.5 | | |
| **Morocco** | **32.5** | **1.1** | **2849.9** | **2951.3** | **4.6** | **3.8** | **10.7** | **8.9** |
| Sudan | 33.5 | 0.9 | 1635.3 | 1880.9 | 7.3 | -2.1 | 15.8 | 11.4 |
| **Tunisia** | **10.8** | **1.0** | **4212.2** | **4214.8** | **4.4** | **0.8** | **13.8** | **17.9** |

Source: WEO 2014, IMF

# I- Challenges of Debt during transition

# NACs trends are comparable on LT but still still below advanced countries levels



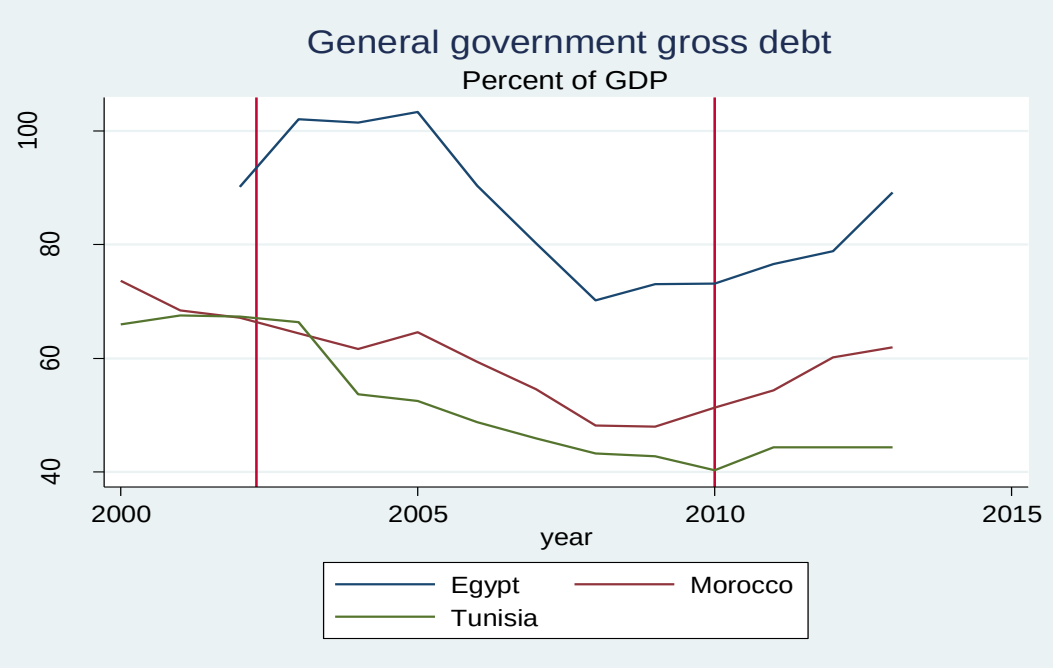
# NACTs Debt during democratic transition is not so higher than before transition but the trends are upward

| | Current Account Balance (% of GDP) | | General Government Structural Balance (% of GDP) | | Primary Balance (% GDP) | | General Government Gross Debt (% of GDP) | |
|---|---|---|---|---|---|---|---|---|
| | 2000-2010 | 2011-2013 | 2000-2010 | 2011-2013 | 2000-2010 | 2011-2013 | 2000-2010 | 2011-2013 |
| Algeria | 14.5 | 5.5 | | | 6.1 | -2.5 | 32.4 | 9.6 |
| **Egypt** | **0.9** | **-2.8** | **-8.1** | **-10.9** | **-4.2** | **-5.5** | **87.1** | **81.6** |
| **Libya** | **25.4** | **13.9** | | | **16.7** | **7.0** | **12.2** | **0.0** |
| Mauritania | -15.6 | -21.9 | | | -1.8 | 1.4 | 167.4 | 86.2 |
| **Morocco** | **0.1** | **-8.4** | **-3.6** | **-6.5** | **0.1** | **-4.1** | **60.1** | **58.8** |
| Sudan | -5.3 | -7.1 | | | | | 106.1 | 85.3 |
| **Tunisia** | **-3.0** | **-8.0** | **-3.0** | **-2.7** | **0.5** | **-3.1** | **54.1** | **44.4** |

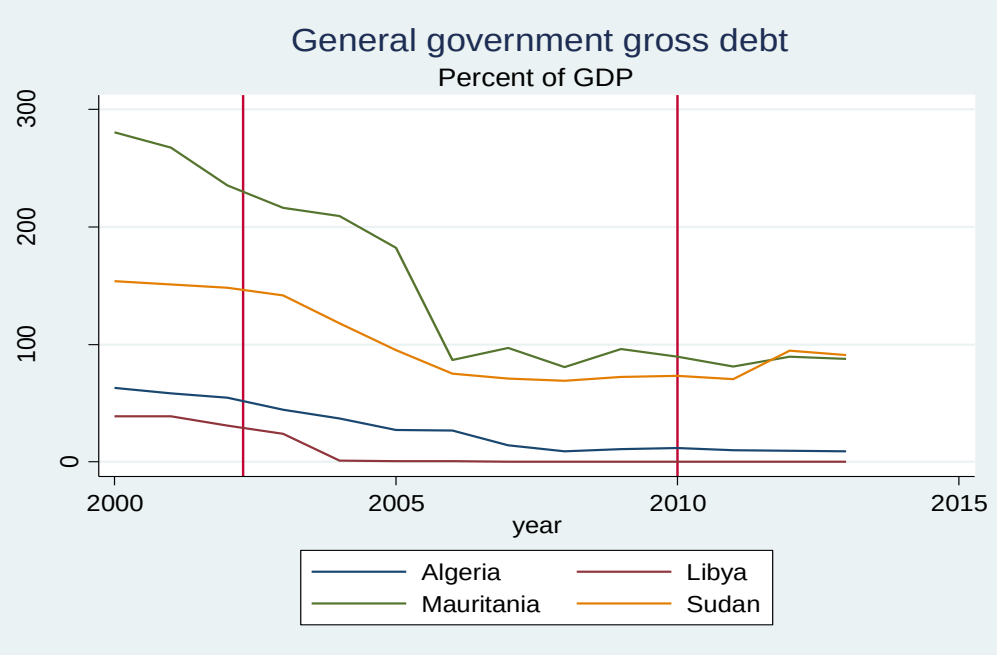
Source : WEO 2014, IMF

# Differences emerged between NACTs

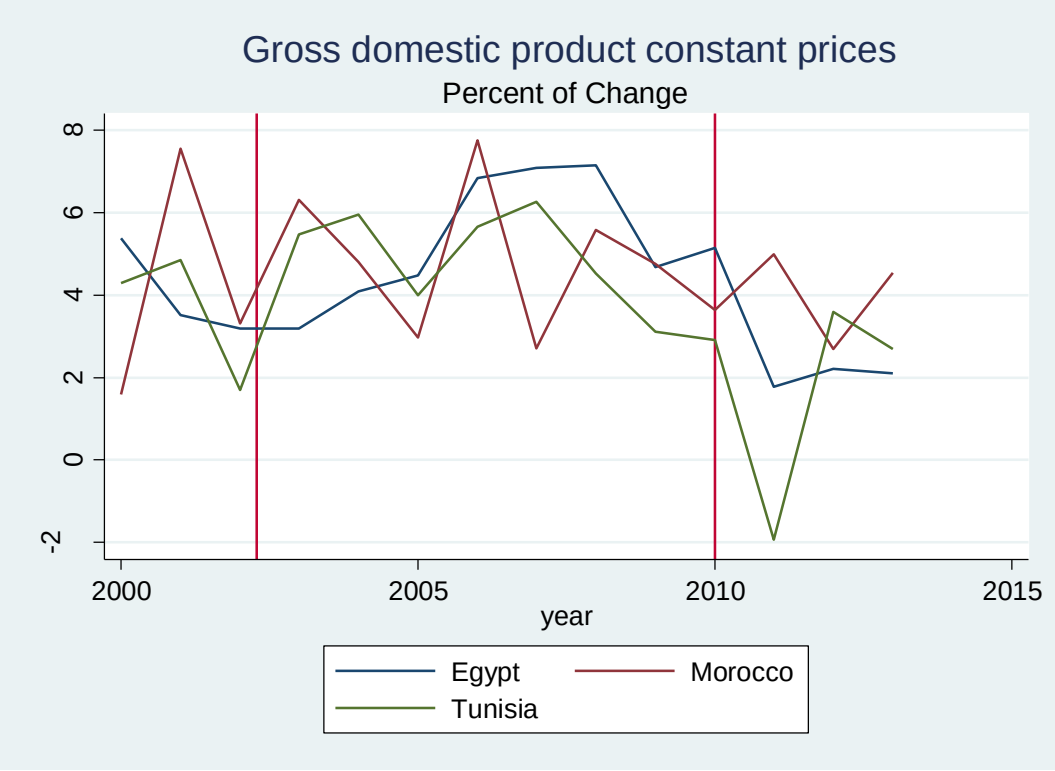
**Net Oil importers has increased debt ratios( Egypt Tunisia Morocco) due to counter-cycle policies**

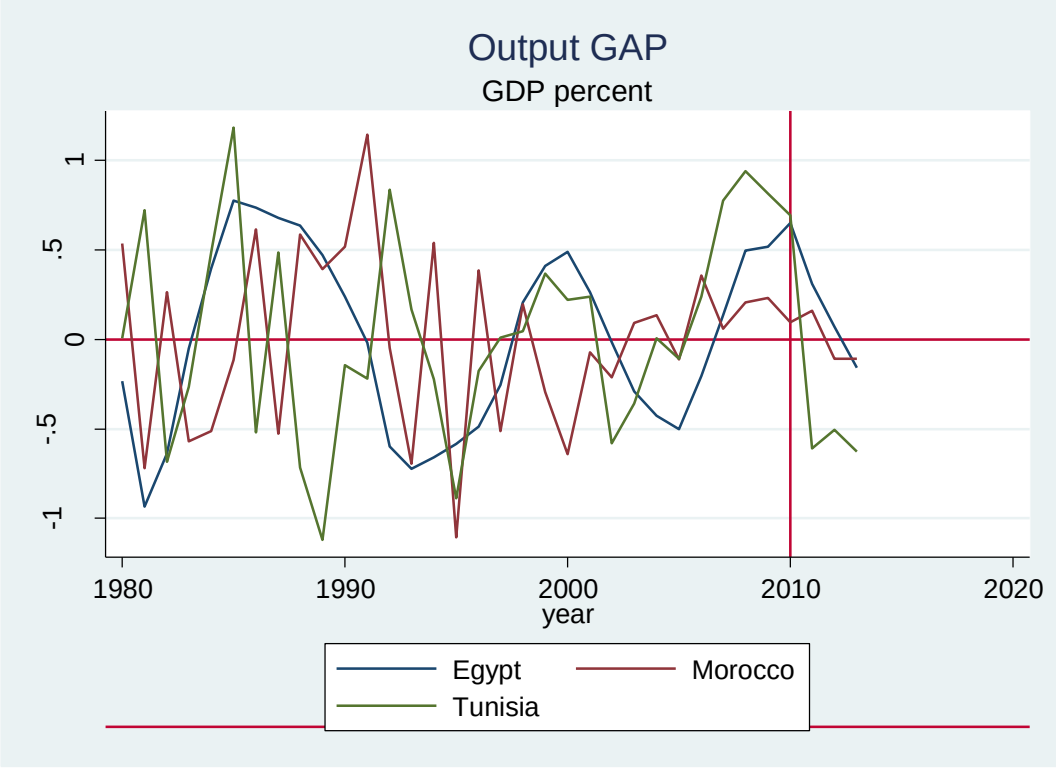



**Net Oil exporters reduced drastically debt ratios ( Libya, Algeria) through fiscal surplus**



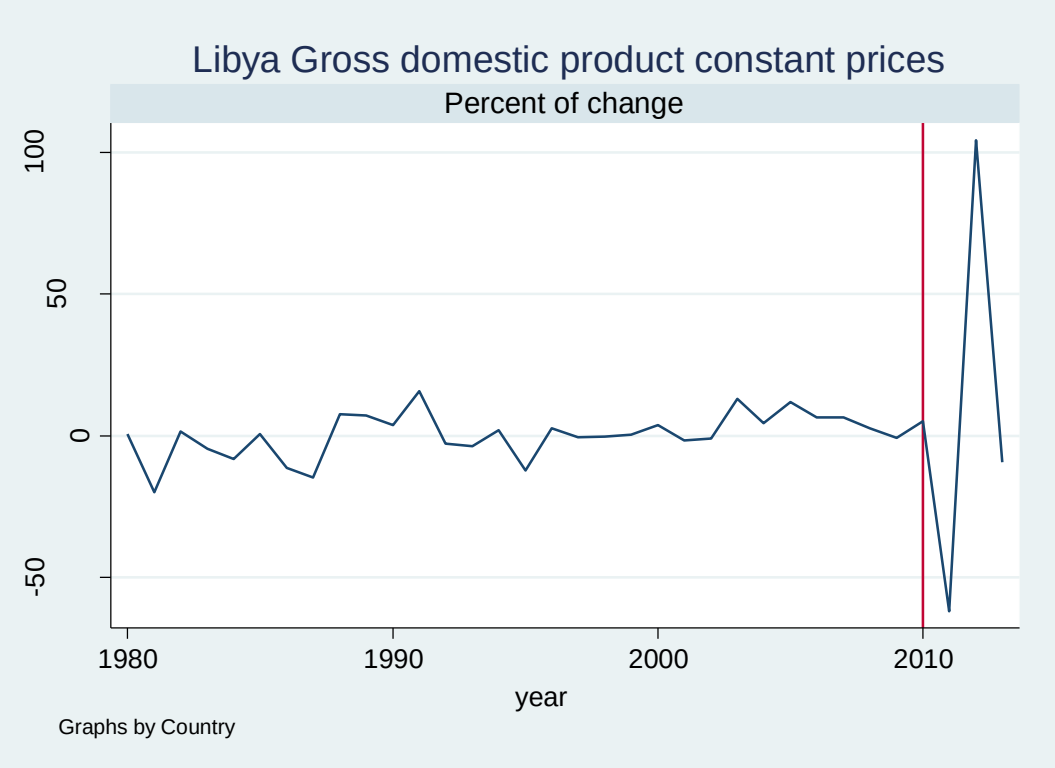
# Recession Gap: growth goes down and negative output gaps are increasing



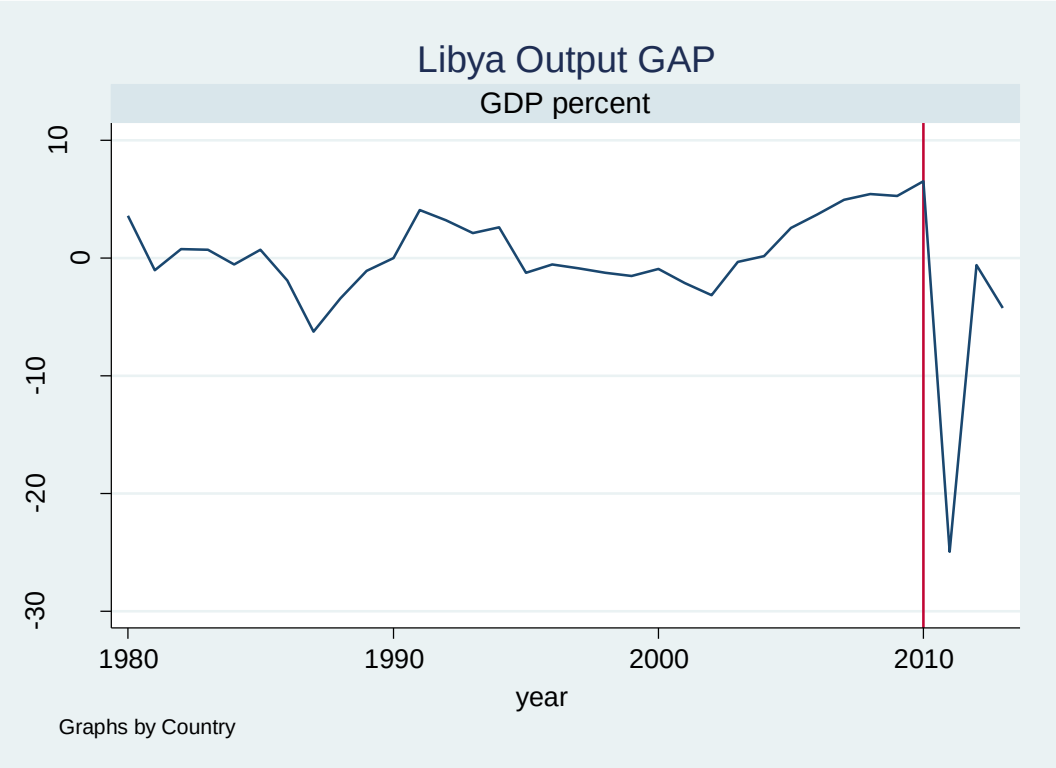



# Libya case is different

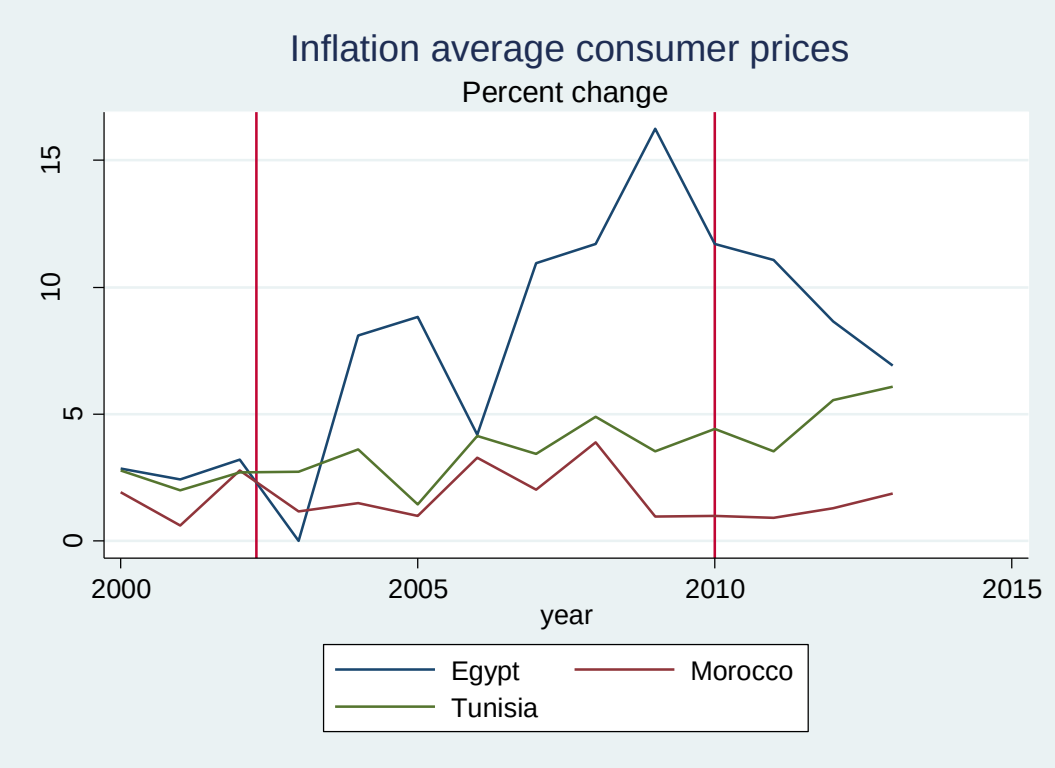
## Shrank of growth

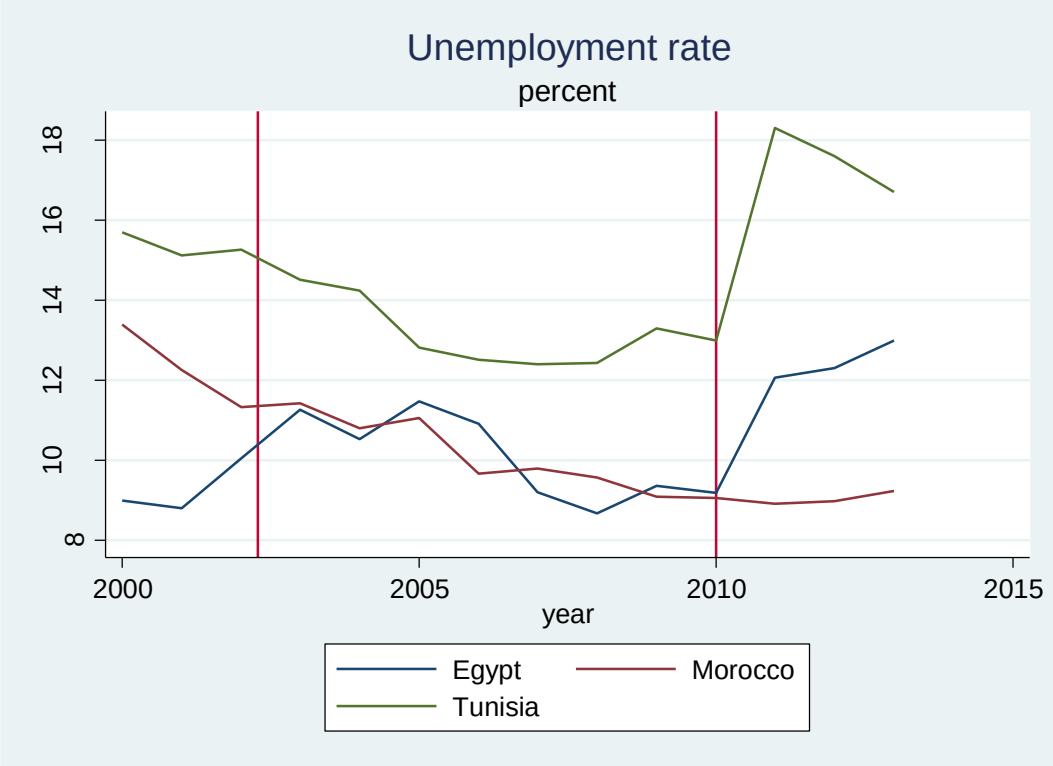



## Deep Recession (Negative output gap)

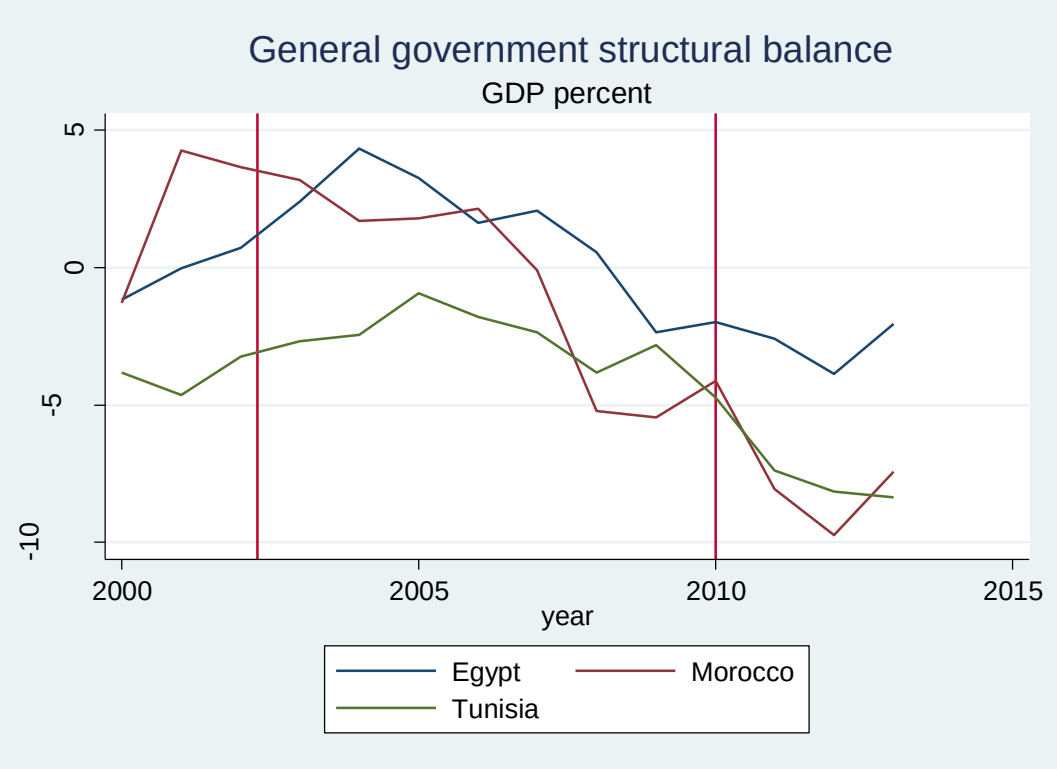


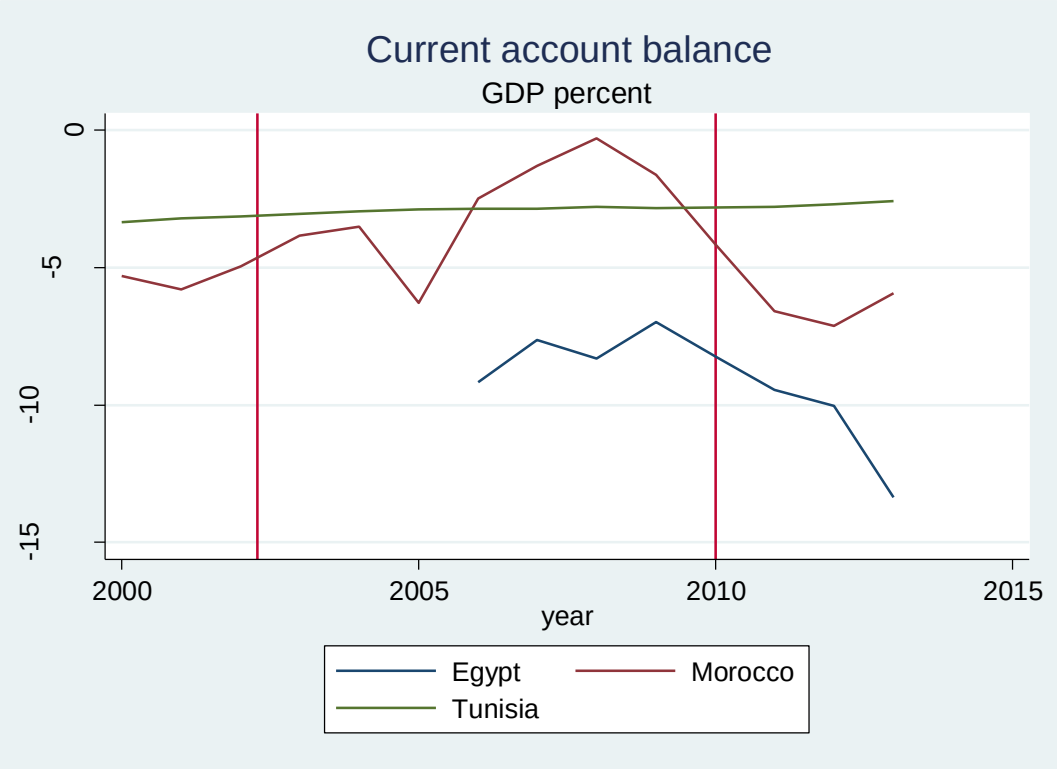
# Increases and persistance of high level of unemployment and inflation (still manageable)



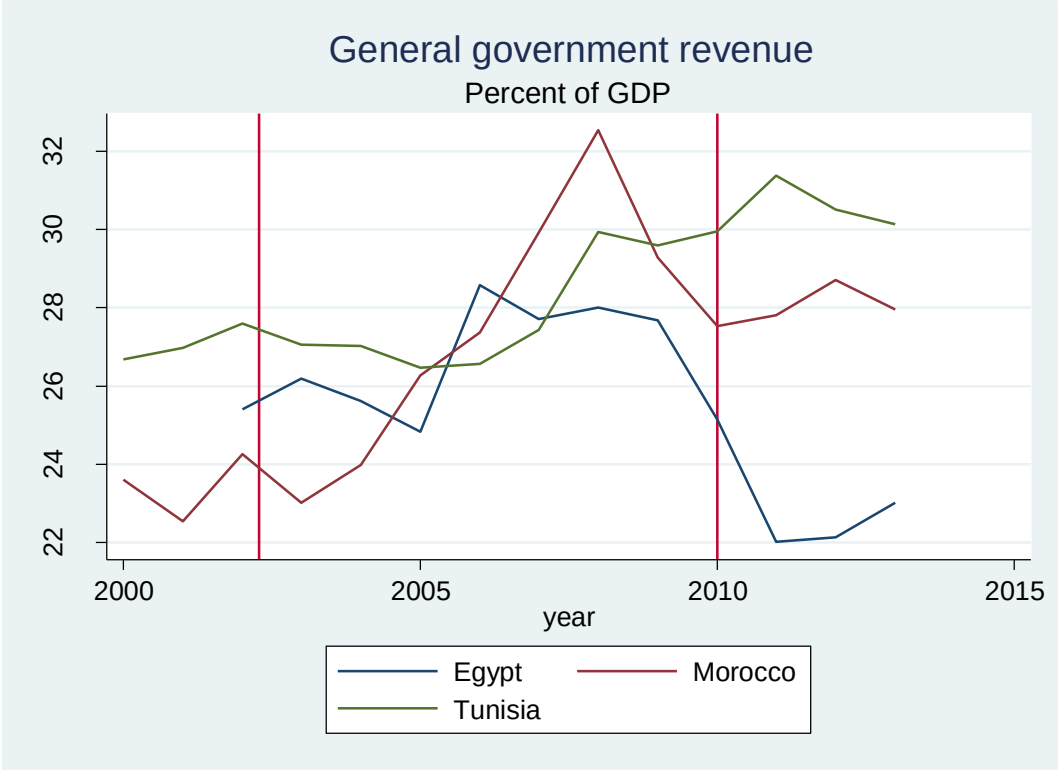



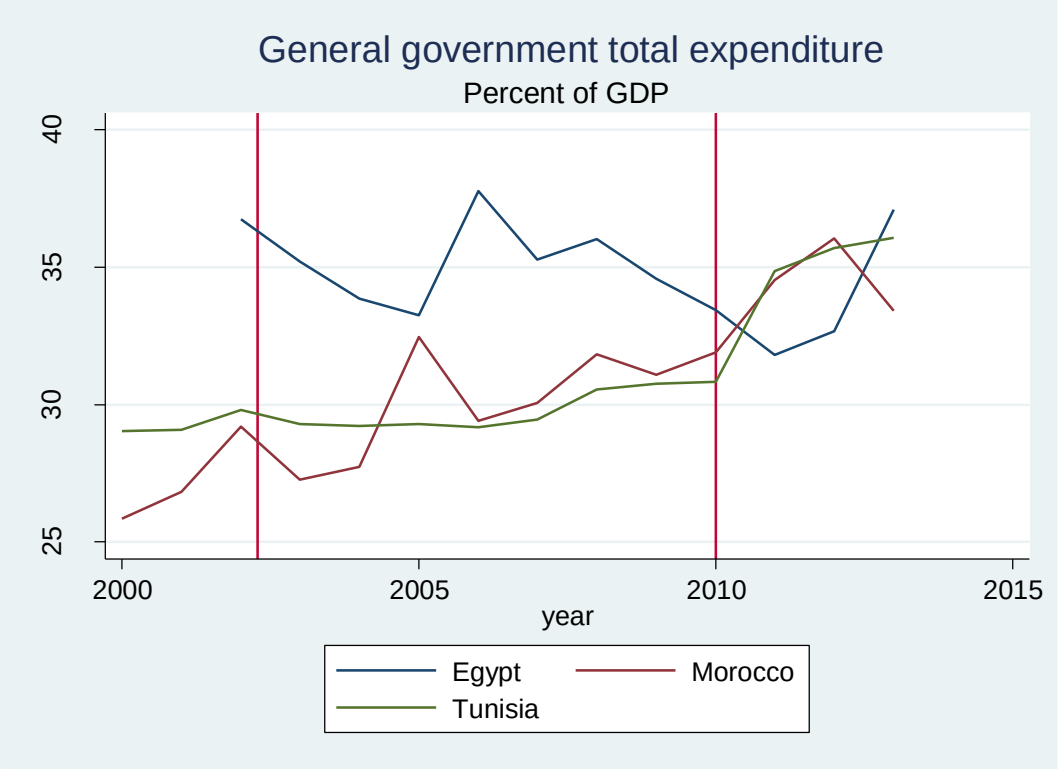
# Greater deterioation of fiscal space and Current account balance



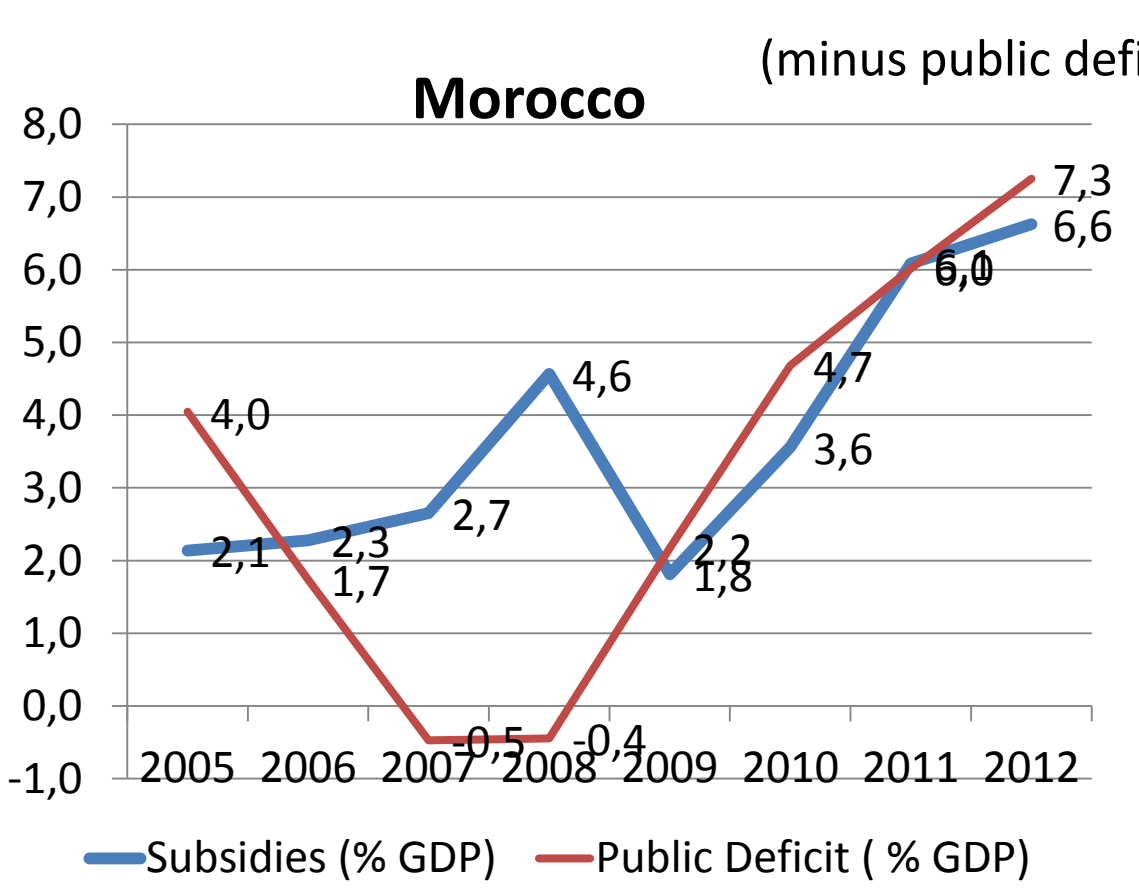
# Increase of expenses and decrease of Revenue Collection

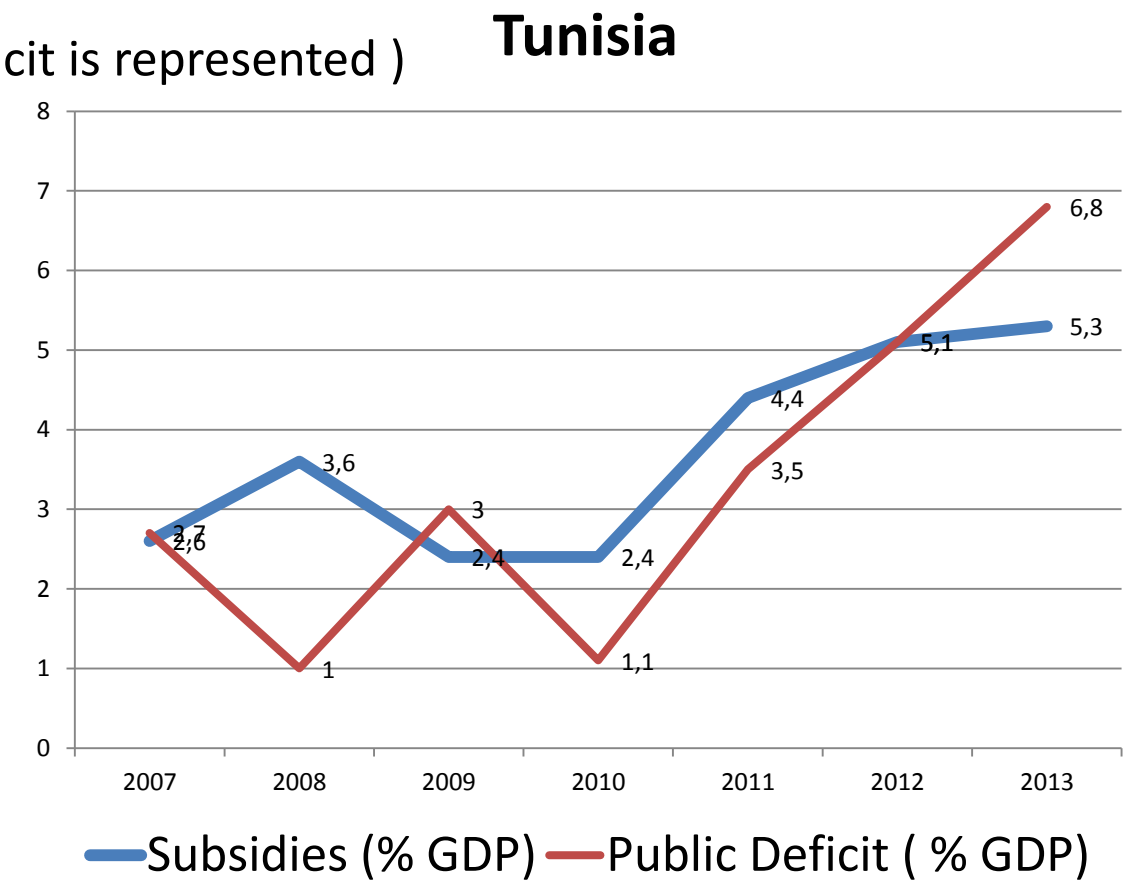


# Correlation of subisidies & Public deficit since the transition as government worry about subisidies reforms

(minus public deficit is represented )



# Key points

- Public debt in NACTs increase rapidly due to recession gap following Arab uprising.
- Increasing expenses due to non reforming Energy subsidies and salaries wages bill reduced the fiscal space
- This reflected into increased borrowing to fund budget deficit

| | Primary Balance (% of GDP) | | Real Interest Rate (%) | | Real Exchange Rate Index 2005=100 | | Nominal depreciation (% Change) | |
|---|---|---|---|---|---|---|---|---|
| | 2000 - 2010 | 2011-2013 | 2000-2010 | 2011-2013 | 2000-2010 | 2011-2013 | 2000-2010 | 2011-2013 |
| Algeria | 6.1 | -3.4 | 0.3 | -3.1 | 106.8 | 104.6 | 4.3 | 4.3 |
| Egypt | -4.2 | -4.9 | 4.6 | -0.5 | | | 1.6 | 1.8 |
| Libya | 16.7 | 9.7 | -4.4 | | | | 0.0 | 0.2 |
| Mauritania | -1.8 | 2.0 | 14.0 | 12.0 | | | 5.5 | 5.6 |
| Morocco | 0.1 | -4.7 | 11.7 | | 102.5 | 94.8 | 2.2 | 2.1 |
| Tunisia | 0.5 | -2.5 | | | 103.8 | 91.3 | 0.3 | 0.4 |
| Total | 3.9 | -0.6 | 4.8 | 2.8 | 104.4 | 96.9 | 2.1 | 2.2 |
| Sudan | | | | | | | 0.9 | 0.9 |

# Role of  sovereign credit ratings: Too much Too late

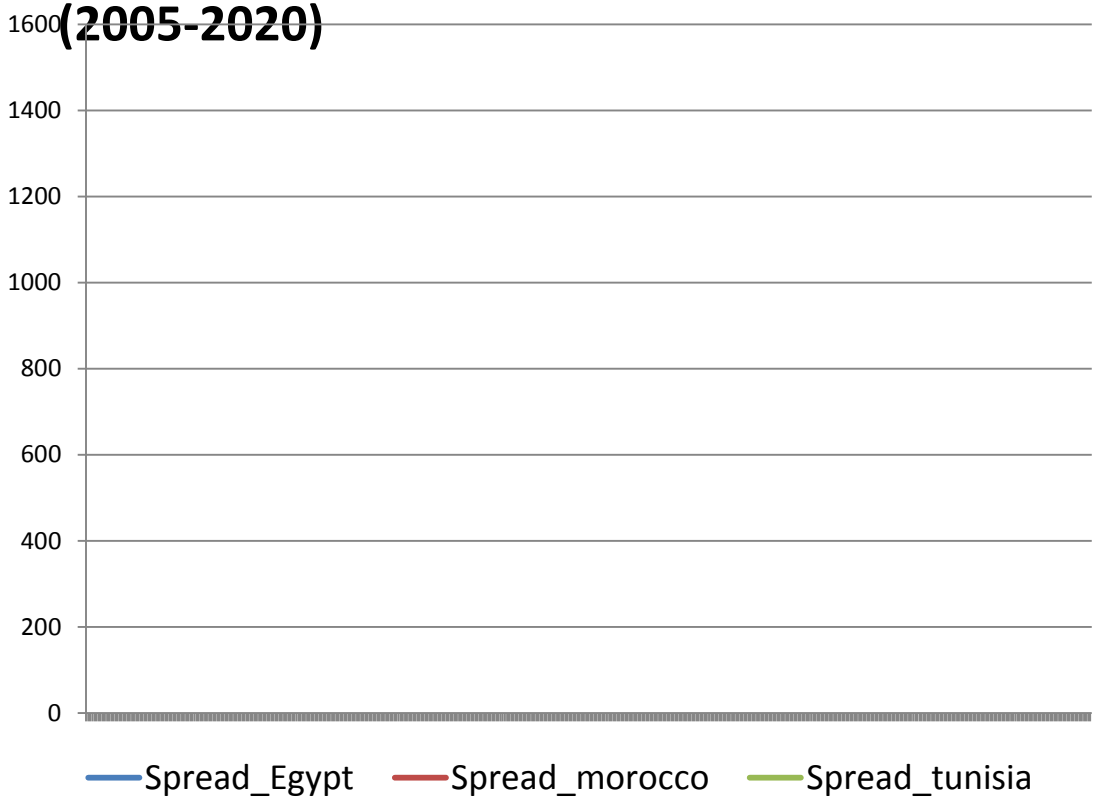
- Three countries ( Egypt, Tunisia & Morocco) have credit ratings
- Ratings are overall declining with downgrade outlook
- Bad credit ratings complicate sovereign bonds issusance and decourage FDI
- 2 keys factors for Bad credit ratings: 1) Political instability and 2) fiscal stance ( debt and fiscal balance)
- Too much,  Too late

# Downgrading rating

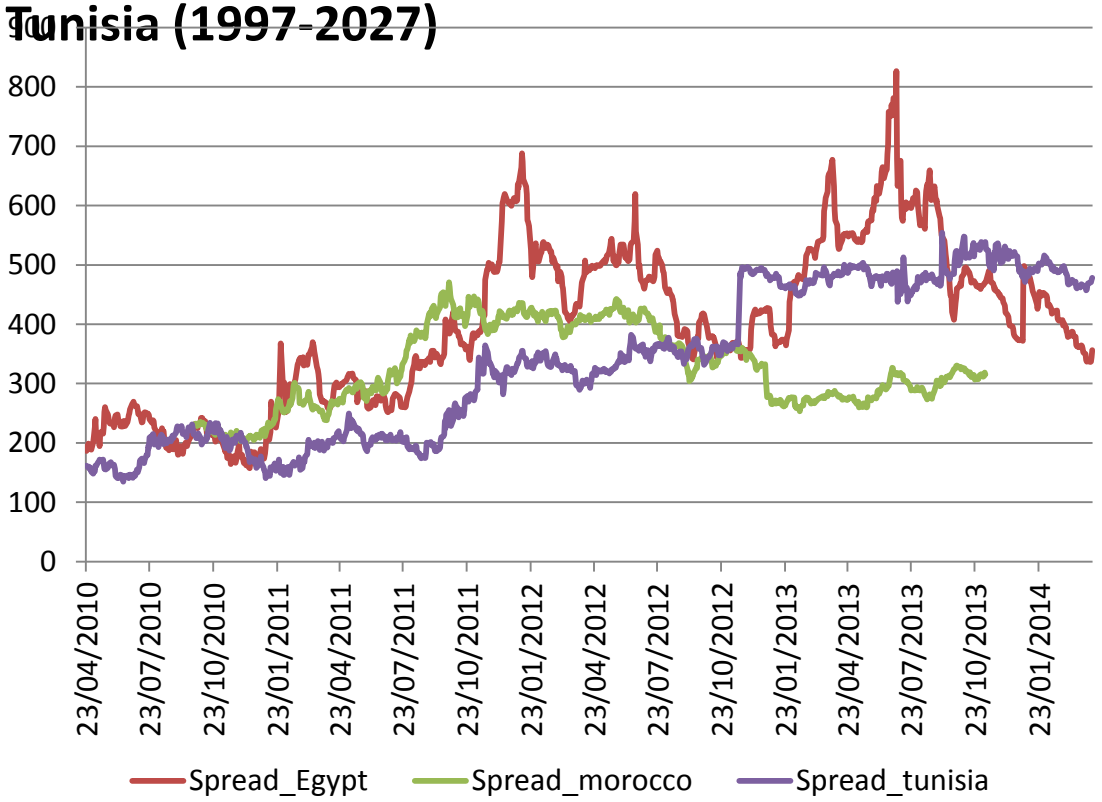
| | | S&P | | | MOODY's | | | Fitch | |
|---|---|---|---|---|---|---|---|---|---|
| | Tunisia | Egypt | Morocco | Tunisia | Egypt | Morocco | Tunisia | Egypt | Morocco |
| 2003 | BBB | BB+ | BB | Baa2 | Ba1 | Ba1 | BBB | BB+ | NR |
| 2004 | BBB | BB+ | BB | Baa2 | Ba1 | Ba1 | BBB | BB+ | NR |
| 2005 | BBB | BB+ | BB+ | Baa2 | Ba1 | Ba1 | BBB | BB+ | NR |
| 2006 | BBB | BB+ | BB+ | Baa2 | Ba1 | Ba1 | BBB | BB+ | NR |
| 2007 | BBB | BB+ | BB+ | Baa2 | Ba1 | Ba1 | BBB | BB+ | BBB- |
| 2008 | BBB | BB+ | BB+ | Baa2 | Ba1 | Ba1 | BBB | BB+ | BBB- |
| 2009 | BBB | BB+ | BB+ | Baa2 | Ba1 | Ba1 | BBB | BB+ | BBB- |
| 2010 | BBB | BB+ | BBB- | Baa2 | Ba1 | Ba1 | BBB | BB+ | BBB- |
| 2011 | **BBB-** | **B+** | **BBB-** | **Baa3** | **B2** | **Ba1** | **BBB-** | **BB-** | **BBB-** |
| 2012 | **BB** | **B** | **BBB-** | **Baa3** | **B2** | **Ba1** | **BB+** | **B+** | **BBB-** |
| 2013 | **BB** | **B-** | **BBB-** | **Baa3** | **B3** | **Ba1** | **BB+** | **B** | **BBB-** |
| 2014 | | **B-** | **BBB-** | **Baa3** | **Caa1** | **Ba1** | **BB-** | **B-** | **BBB-** |

# Increase of Spread from Bloomberg Benchmark

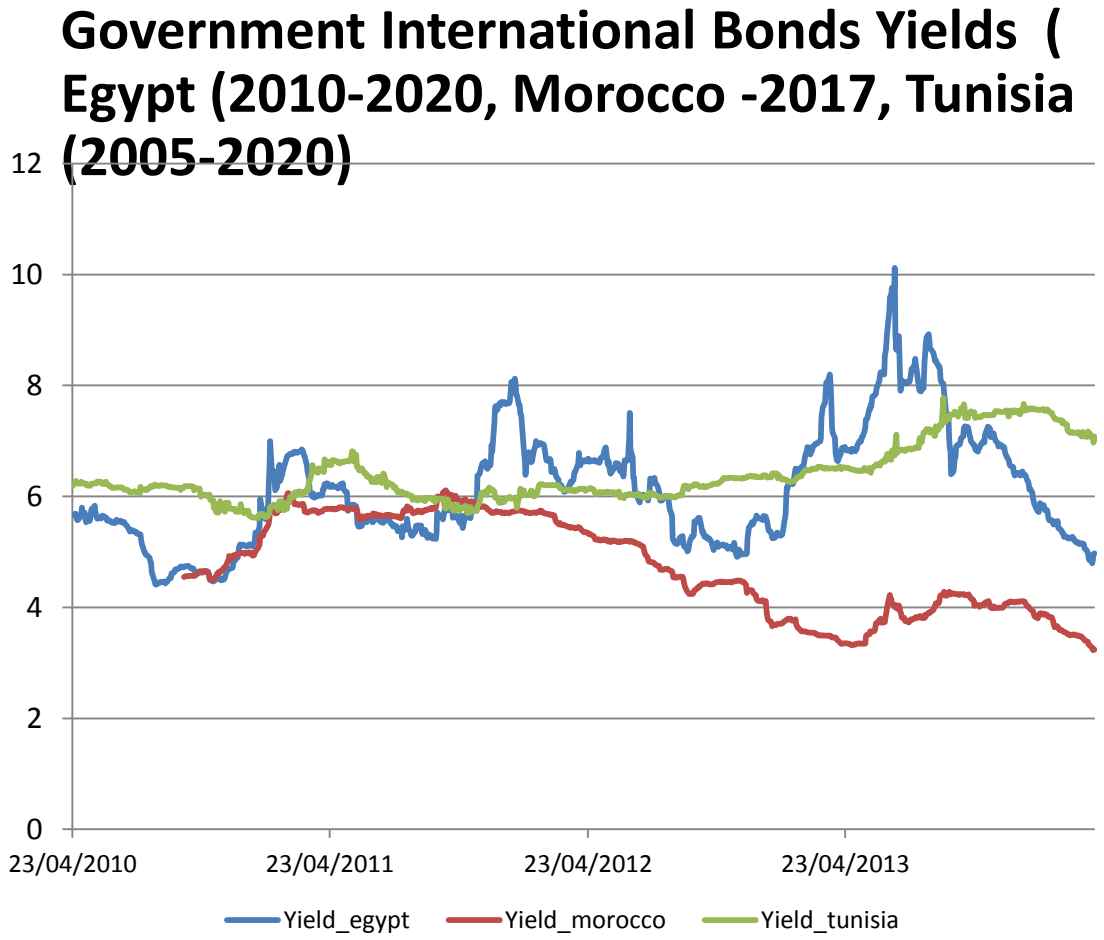
**Government International Bonds Spread ( Egypt (2010-2020, Morocco -2017, Tunisia (2005-2020)**

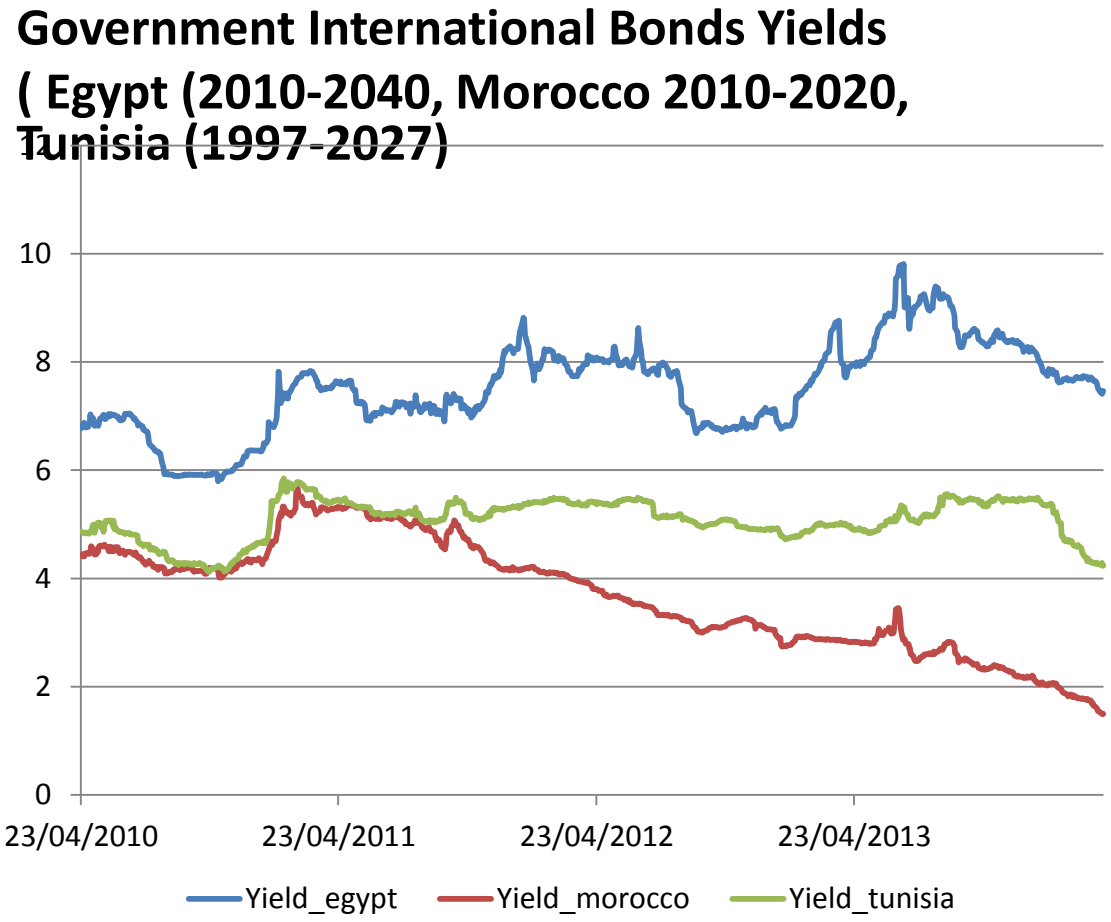



**Government International Bonds Yields ( Egypt (2010-2040, Morocco 2010-2020, Tunisia (1997-2027)**



# Decrease of Yield Bonds



# II- DEBT SUSTAINABILITY RISKS

- The goal of fiscal sustainability analysis is to form a view about drivers of Debt to GDP ratio and how the outstanding net stock of a government's debt is likely to evolve over time.
- A mixture between Backward and Forward Looking Approach.
- Three ways of Sustainability Analysis are conducted

1) The first calculates the Debt-Stabilizing Primary Surplus,
2) the second establish the Historical Drivers of Debt before the transition.
3) The Third is a Forward Approach Based on Monte Carlo Simulation for 2014-2019

# 1- Debt-stabilizing primary surplus,

# Debt basic equation

Let's begin with basic equation of Debt

$$D_t = (1 + r_{t-1})D_{t-1} - PB_t$$

Where $D_t$ is level of Debt, $r_{t-1}$ is interest rate and $PB_t$ Primary Balance level. Dividing by GDP we obtain:

$$D_t/GDPt = (1+r)\ Dt_{-1}/GDPt - PBt/GDPt$$

Given that $GDP_t = (1+g) * GDP_{t-1}$ where g= nominal growth rate, we get:

$$D_t/GDPt = (1+r) / (1+g)\ Dt_{-1}/GDPt_{-1} - PBt/GDPt$$

With $d=D/GDP$ and $pb=PB/GDP$

$$d_t = (1+r) / (1+g) * dt_{-1} - pbt$$

*Or*

$$pb_t = (1+r) / (1+g) * dt_{-1} - dt$$

for debt to be stable $d_t = d_{t-1}$. Thus,

$$pb_t = (1+r) / (1+g) * dt_{-1} - dt_{-1} = (r-g) / (1+g) * d_{t-1} = (r-g)\ d_{t-1}$$

# Changes in the Debt-to-GDP ratio

what is the extent of the primary balance that the government needs to generate in order to maintain or decrease its debt ratio?

$$pb_t = (r - g)d_{t-1}$$

The equation shows that the primary balance hinges on the difference between the interest rate and the nominal growth rate of GDP.

The primary balance is regarded as a target for policy intervention to secure fiscal sustainability. Government should on average run a sufficiently large primary surplus to ensure that it has a positive or zero net wealth.

# Primary balance required to maintain net public debt at 45 percent of GDP in Tunisia

| **Pb=-3.1** | | **Real growth rate (%)** | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **d=45%** | | 3 | 3,5 | **4** | **4,5** | 5 | 5,5 | 6 |
| **Real interest rate (%)** | 2 | -0,5% | -0,7% | -0,9% | -1,1% | -1,4% | -1,6% | -1,8% |
| | 3 | 0,0% | -0,2% | -0,5% | -0,7% | -0,9% | -1,1% | -1,4% |
| | **4** | 0,5% | 0,2% | **0,0%** | **-0,2%** | -0,5% | -0,7% | -0,9% |
| | **5** | 0,9% | 0,7% | **0,5%** | **0,2%** | 0,0% | -0,2% | -0,5% |
| | 6 | 1,4% | 1,1% | 0,9% | 0,7% | 0,5% | 0,2% | 0,0% |
| | 7 | 1,8% | 1,6% | 1,4% | 1,1% | 0,9% | 0,7% | 0,5% |
| | 8 | 2,3% | 2,0% | 1,8% | 1,6% | 1,4% | 1,1% | 0,9% |

# Primary balance required to maintain net public debt at 58 percent of GDP in Morocco

Pb=-4,1%
d=58%

| Real interest rate (%) \ Real growth rate (%) | 3 | 3,5 | 4 | **4,5** | **5** | 5,5 | 6 |
|---|---|---|---|---|---|---|---|
| 2 | -0,6% | -0,9% | -1,2% | -1,5% | -1,7% | -2,0% | -2,3% |
| 3 | 0,0% | -0,3% | -0,6% | -0,9% | -1,2% | -1,5% | -1,7% |
| 4 | 0,6% | 0,3% | 0,0% | -0,3% | -0,6% | -0,9% | -1,2% |
| **5** | 1,2% | 0,9% | 0,6% | **0,3%** | **0,0%** | -0,3% | -0,6% |
| **6** | 1,7% | 1,5% | 1,2% | **0,9%** | **0,6%** | 0,3% | 0,0% |
| 7 | 2,3% | 2,0% | 1,7% | 1,5% | 1,2% | 0,9% | 0,6% |
| 8 | 2,9% | 2,6% | 2,3% | 2,0% | 1,7% | 1,5% | 1,2% |

# Keys points

- Fiscal consolidation will require significant effort over the medium term.
- While countries are at various levels of Debt to Gdp ratio and various stages of fiscal adjustment policy, these illustrative scenarios can shed light on the scale of the challenge: **if public debt ratios were to remain at their current levels, the primary balances would be positive and reach in some case more than 1 percent of GDP**.

- Restoring debt to sustainable levels (assumed here, for purposes of illustration, at around the 2013 level ) over the medium term will require raising the economic growth to 5 to 6% on average while keeping zero primary balance.

# 2- Debt Drivers

# DEBT DYNAMIC in OPEN ECONOMY

$$d_t = \left[\frac{(1 + \bar{i}_t + \varepsilon_t \alpha^f \left(1 + i_t^f\right)}{(1 + \pi_t)(1 + g_t)}\right] d_{t-1} - (pb_t + \mu_t)$$

$with\ \bar{i}_t = i_{t-1}^d(1 - \alpha_{t-1}) + i_t^f \alpha_{t-1}$ is the weighted average of domestic and foreign interest rates and $\alpha_{t-1}$ is the share of debt denominated in foreign currency. To determine the factors contributing to the variation in the debt ratio, simply subtract $d_{t-1}$ on both sides to get :

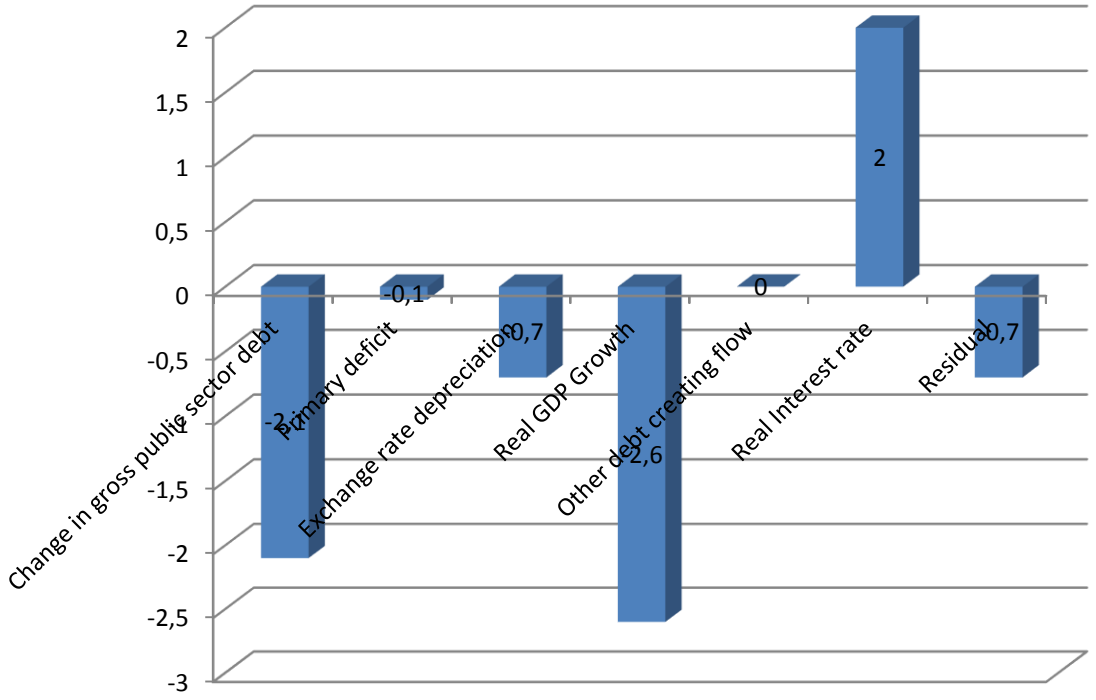
$$\Delta d_t = \left[\frac{\bar{i}_t - \pi_t(1 + g_t) + \varepsilon_t \alpha^f \left(1 + i_t^f\right)}{(1 + \pi_t)(1 + g_t)}\right] d_{t-1} - (pb_t + \mu_t)$$

1. The Real Interest Rate change : $\left[\frac{\bar{i}_t}{(1+\pi_t)(1+g_t)}\right] d_{t-1}$
2. Change Real Growth Rate : $\left[\frac{-\pi_t(1+g_t)}{(1+\pi_t)(1+g_t)}\right] d_{t-1}$
3. Change of the Exchange Rate (appreciation/depreciation) : $\left[\frac{\varepsilon_t \alpha^f \left(1+i_t^f\right)}{(1+\pi_t)(1+g_t)}\right] d_{t-1}$

# Different Historical debt dynamic decreases before the Transition

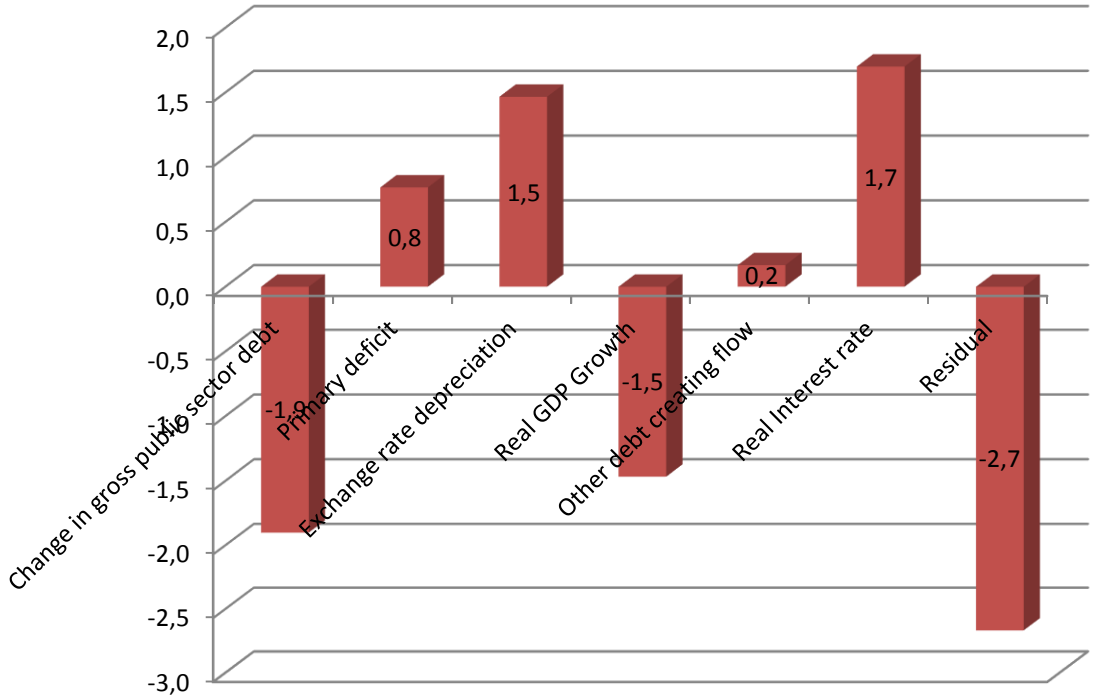
## Growth and Exhange depreciation

### Morocco 2002-2010

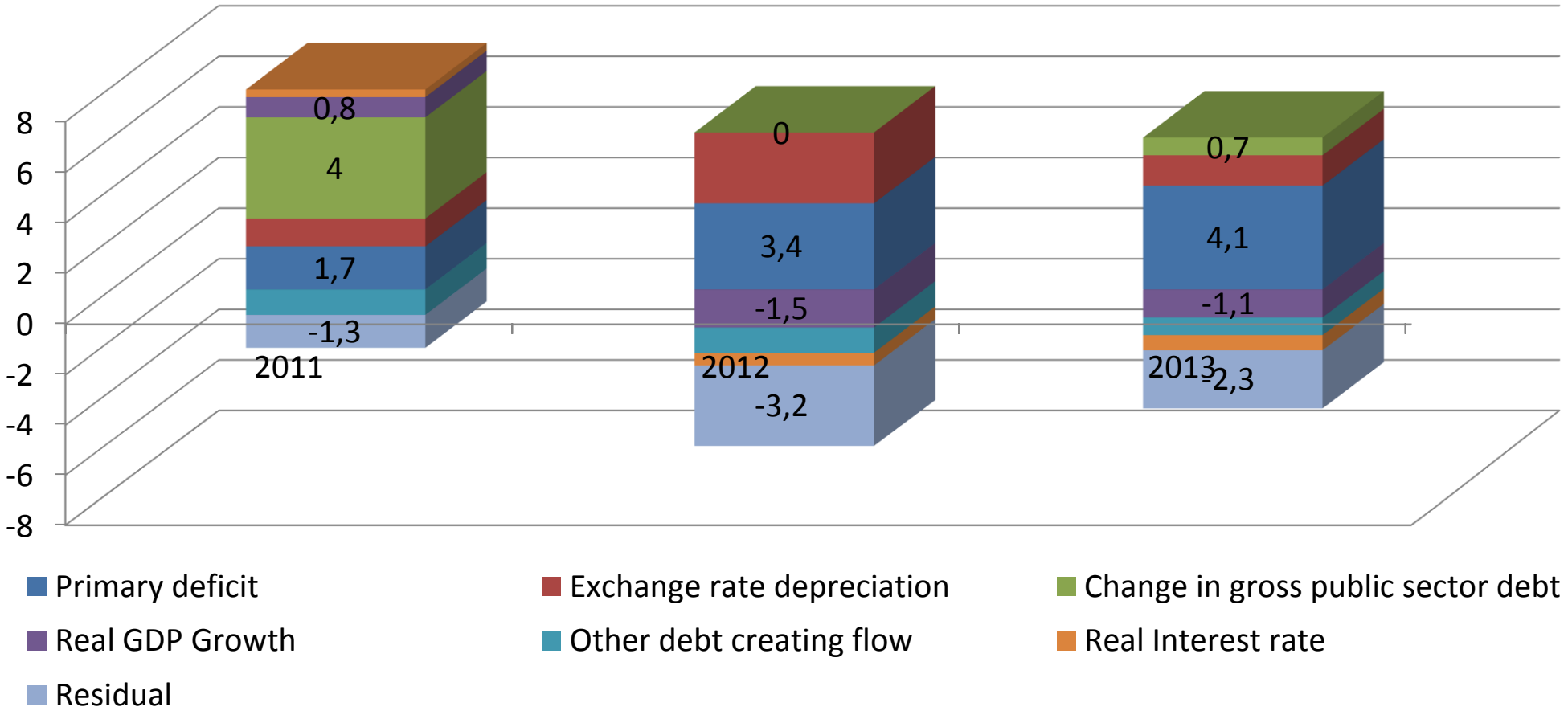



## Growth and Privatisation

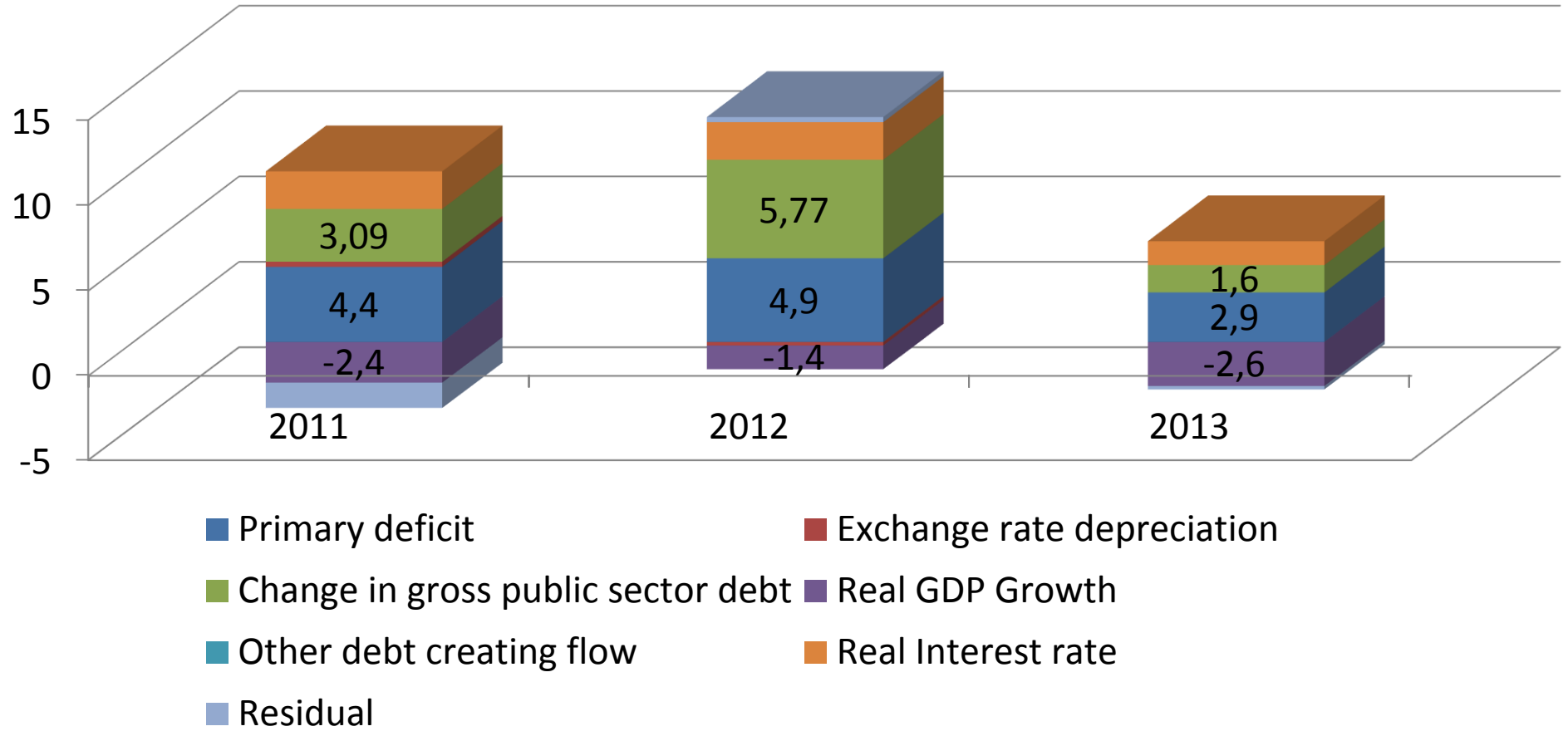
### Tunisia 2008-2010



# Primary balance and Exchange Depreciation are the main drivers of Debt to GDP increases (Tunisia)



# Primary balance and Real Interest Rates are the main drivers of Debt to GDP increases ( Morocco)



# 3- Monte Carlo simulation: Tunisia & Morocco

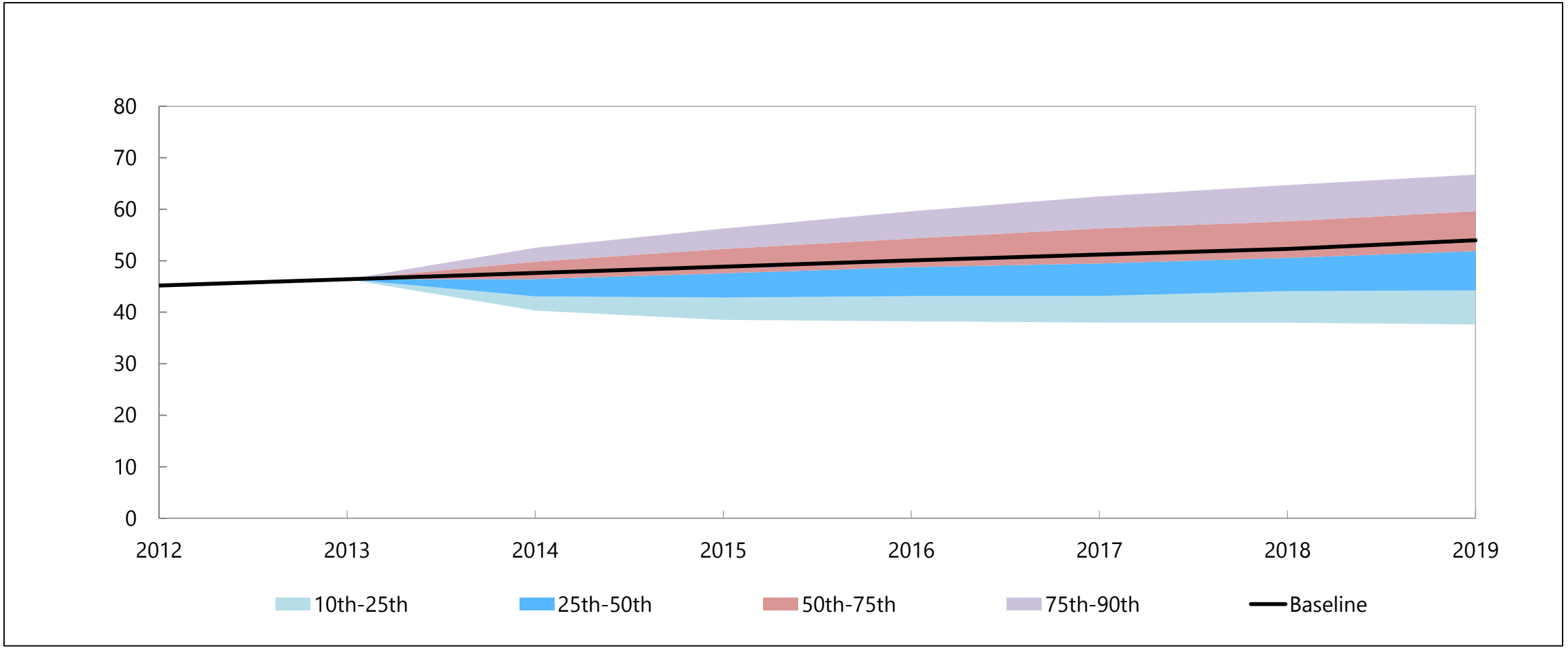
- N=10000,
- T:2014-2019
- Simulate (foreign interest rate, exchange rate, domestic interest rate, inflation rate, Real growth, primary balance…) in the future 2014-2019
- Build the Debt to Gdp ratio
- using Covariance-Variance Matrix
- No correlation
- Cholesky decomposition

# Shocks & Risks

- Growth shocks : decrease  of 0.25*std(g)
- Primary Balance Shocks:  decrease of 0.5*std(pb)
- Depreciation Shocks:  increase of max(dep)-mean(dep)
- Foreign Interest Rate Shocks: + 200 points bases
- Domestic Interest Rate Shocks :+ 200 points bases

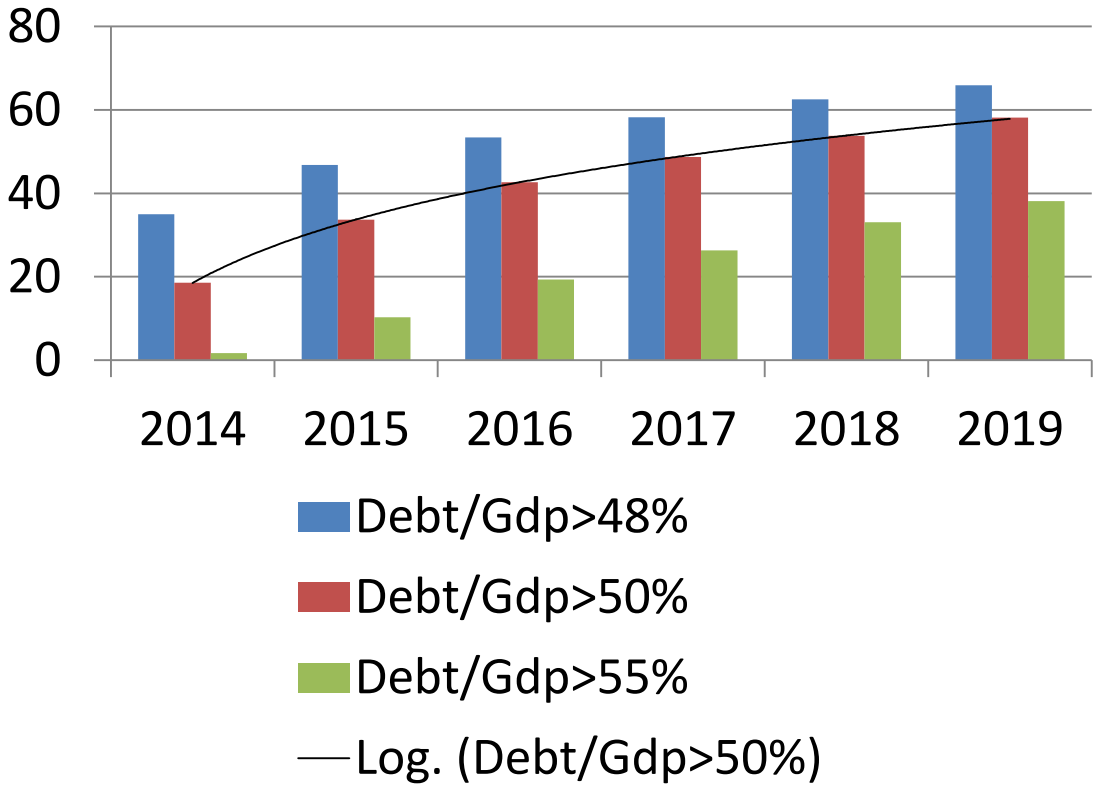
# Debt to GDP Ratio with Cholesky decomposition (Tunisia)

# Fan Chart Debt to GDP Ratio for Tunisia with Cholesky decomposition

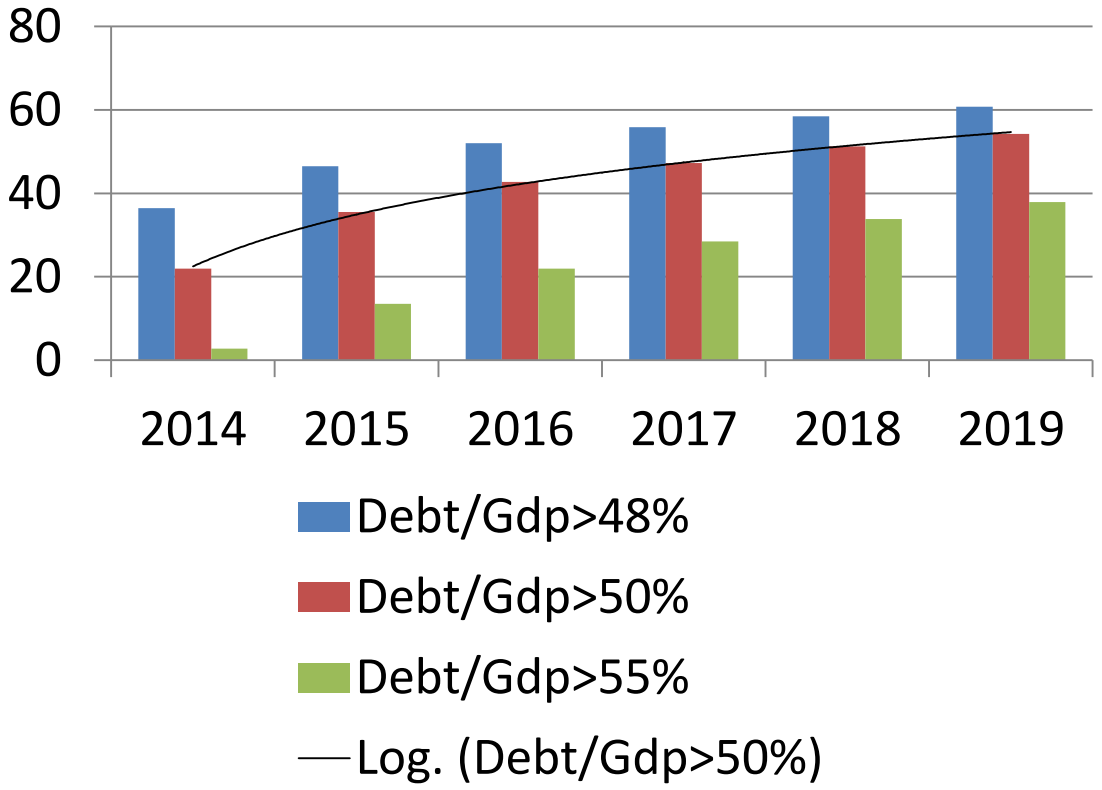


# Increasing Risk of hight Debt to GDP ratio if historial scenario held ( Tunisia)

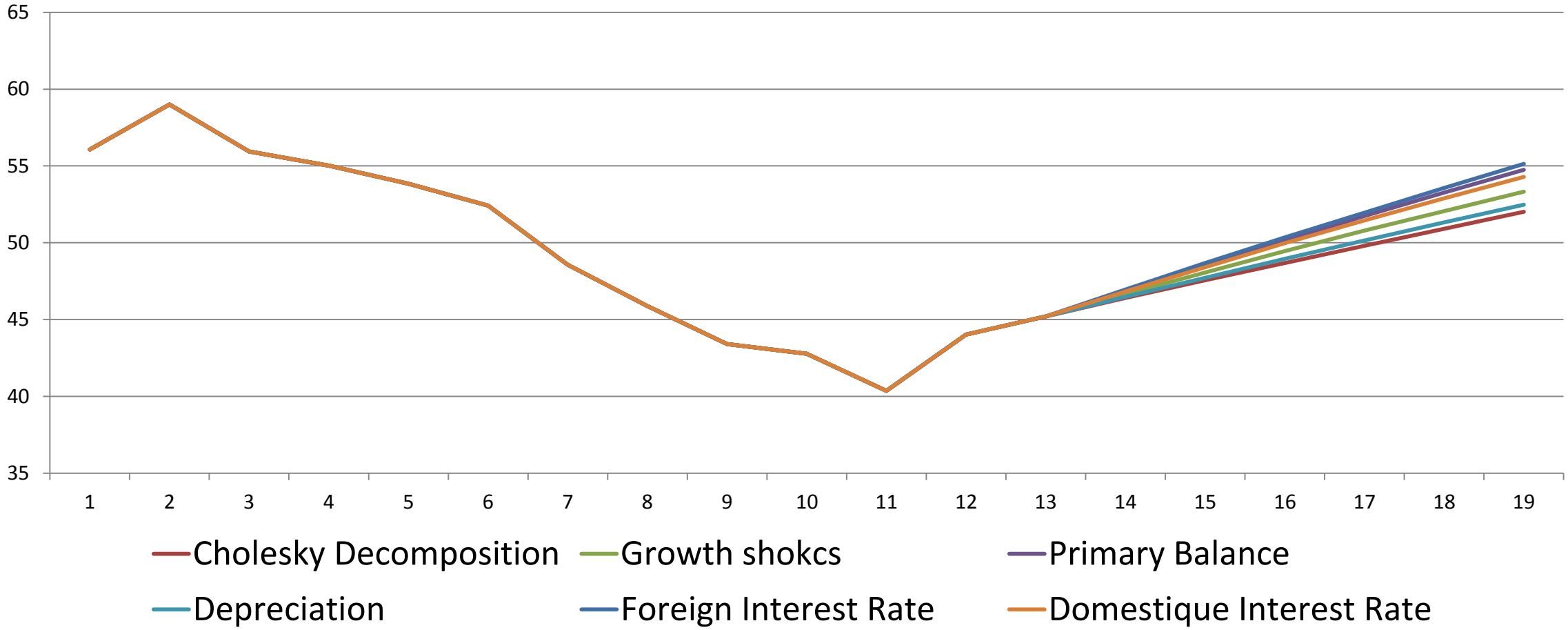
**No correlation**




**Cholesky Decomposition**

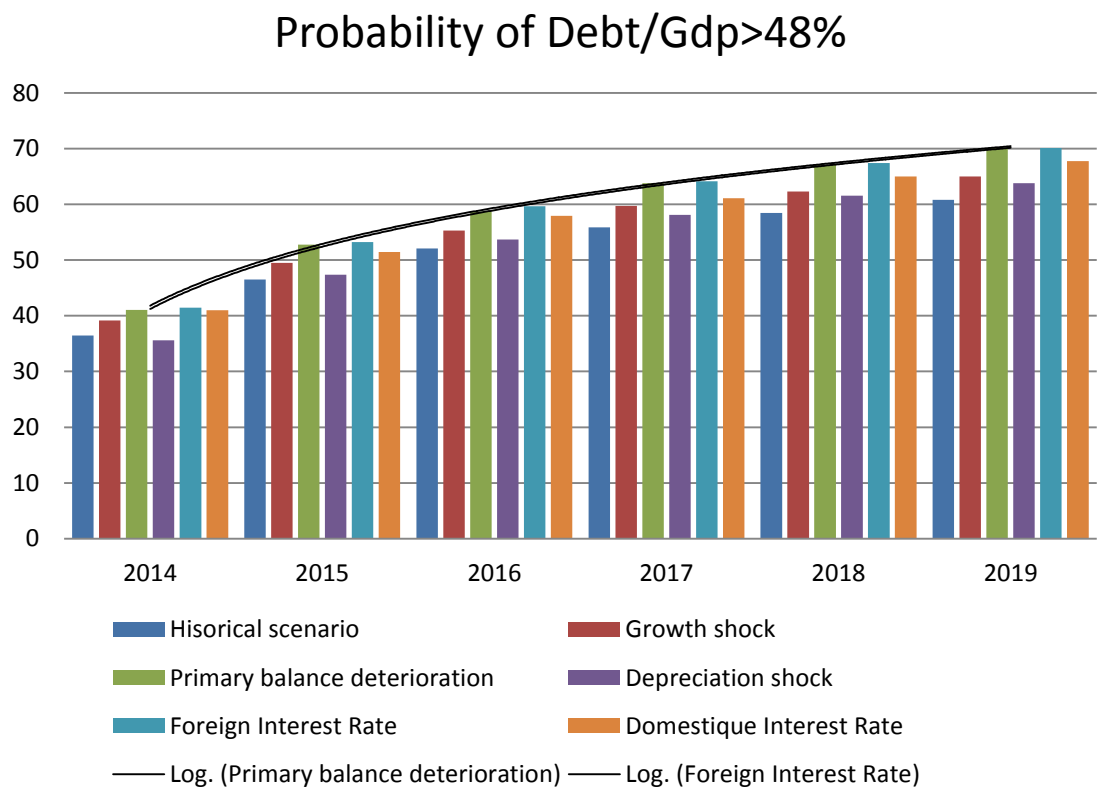


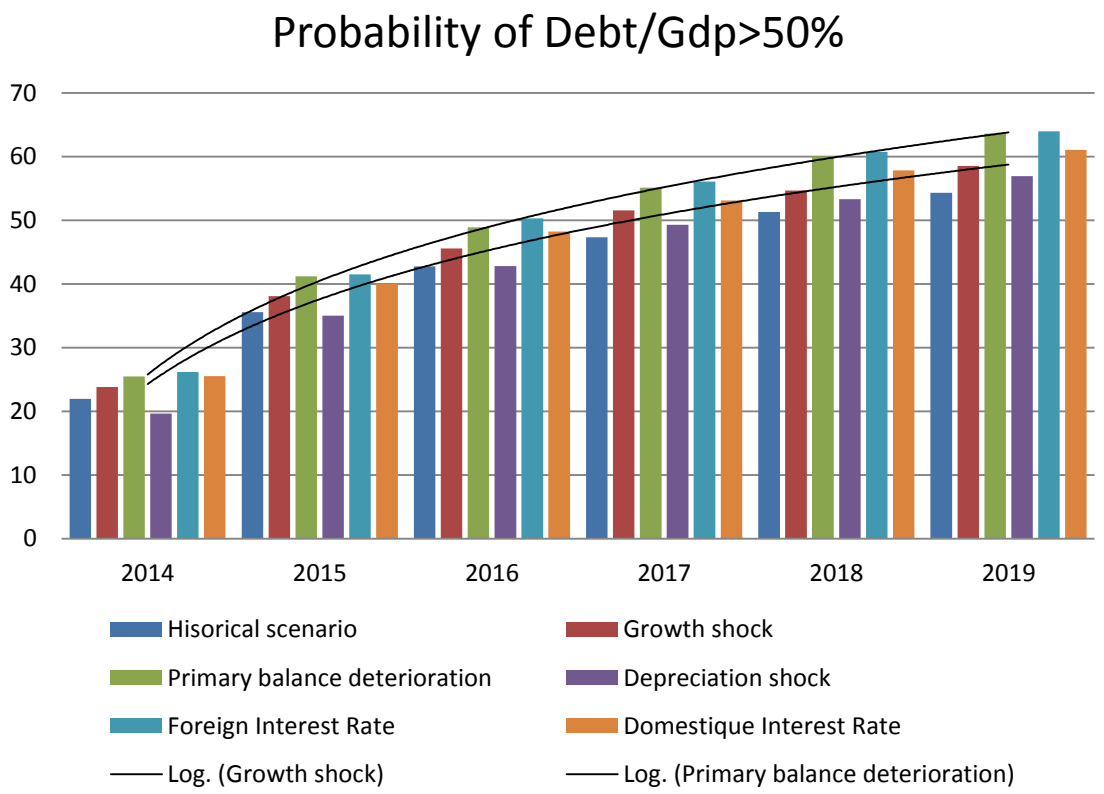
# Impact of macroeconomic shocks on Debt to GDP profil ( Tunisia)



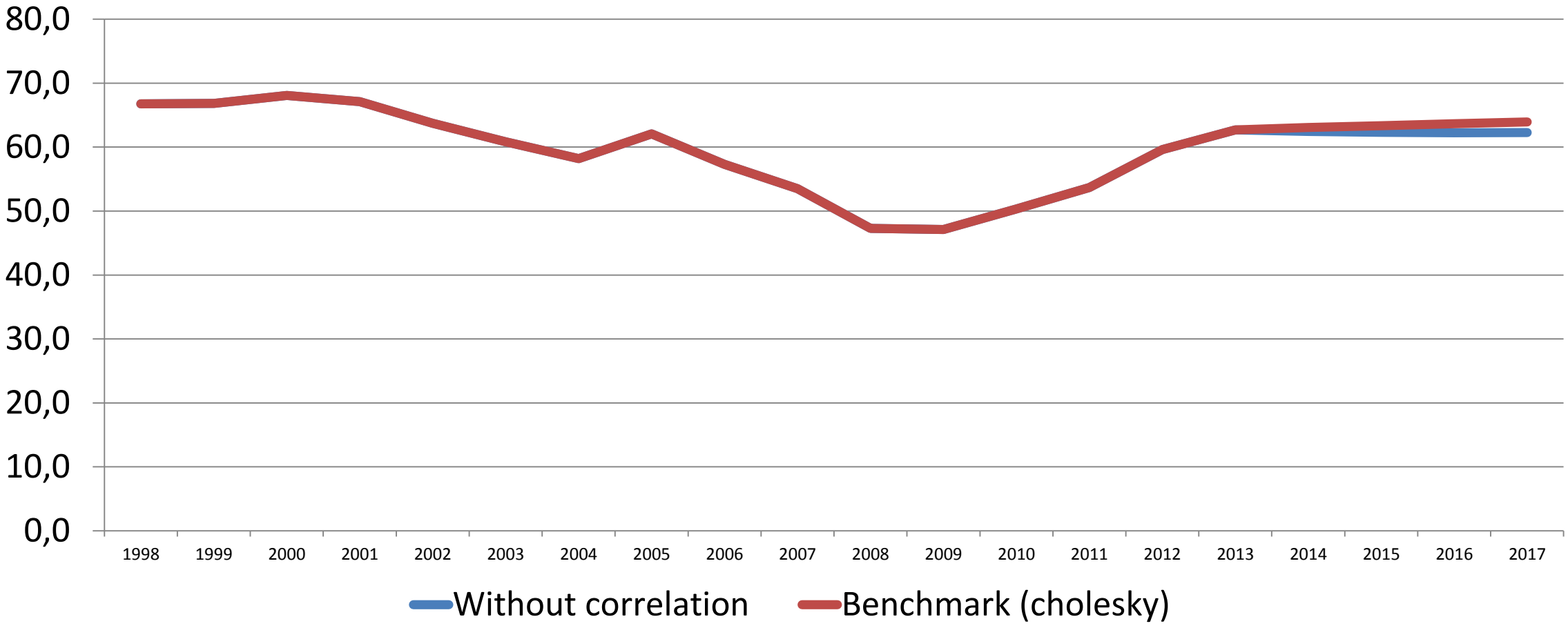
# Hight Risks following macroeconomic shocks ( Tunisia)

## Growth and primary balances are important

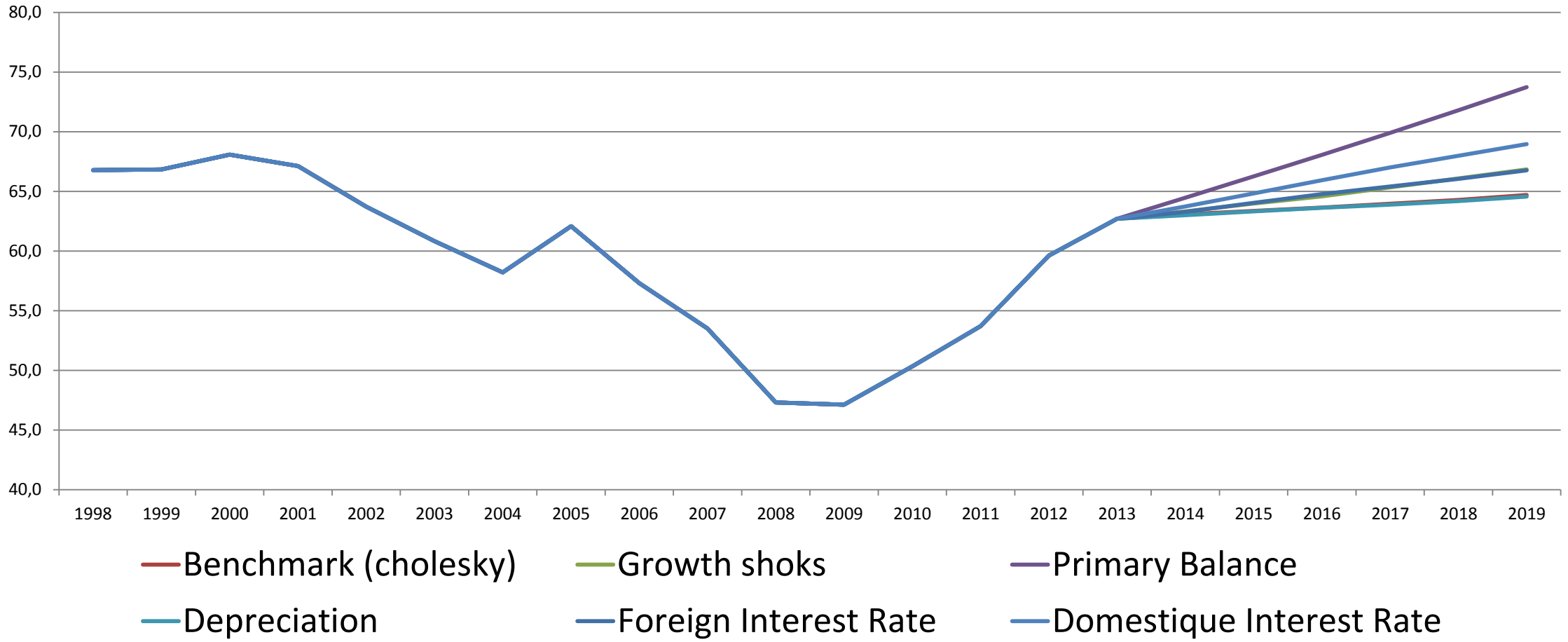


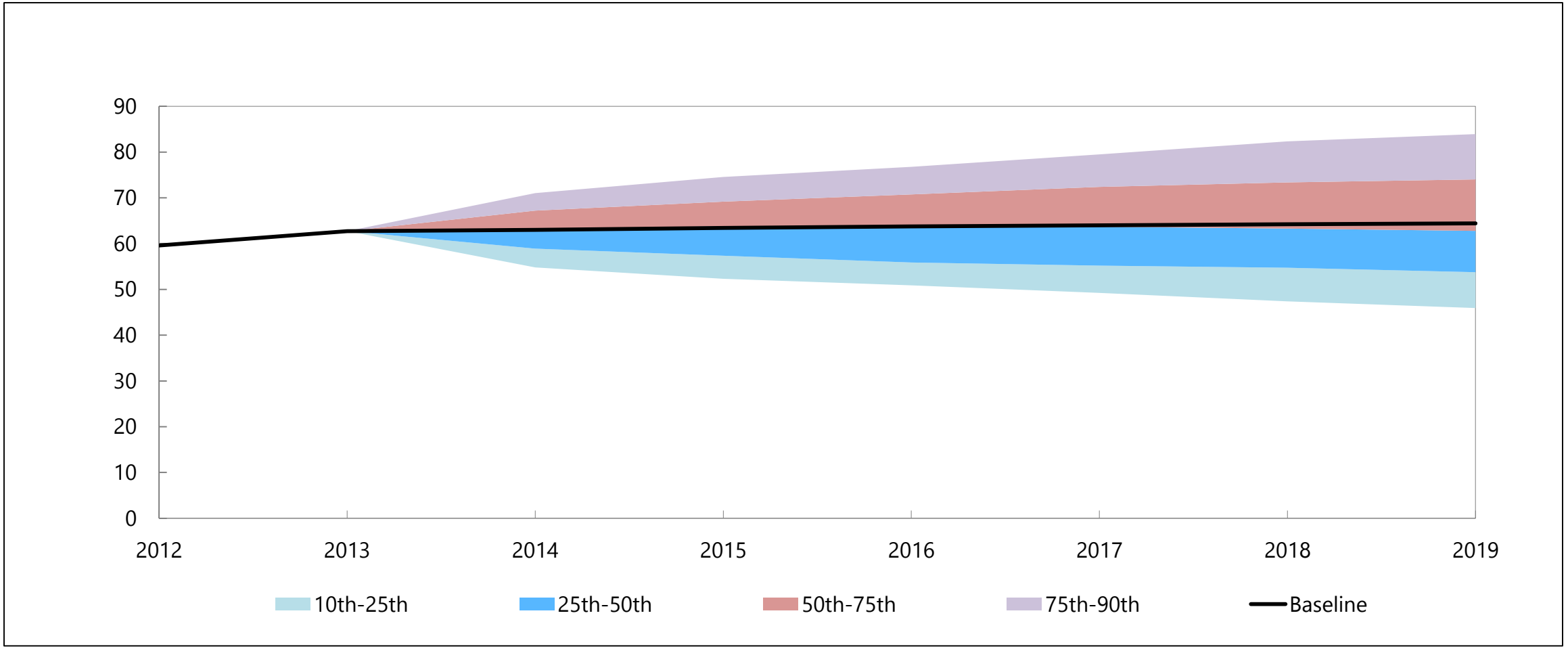
# Debt to GDP Ratio with Cholesky decomposition ( Morocco)



# Impact of macroeconomic shocks on Debt to GDP ratio  profil ( Morocco)

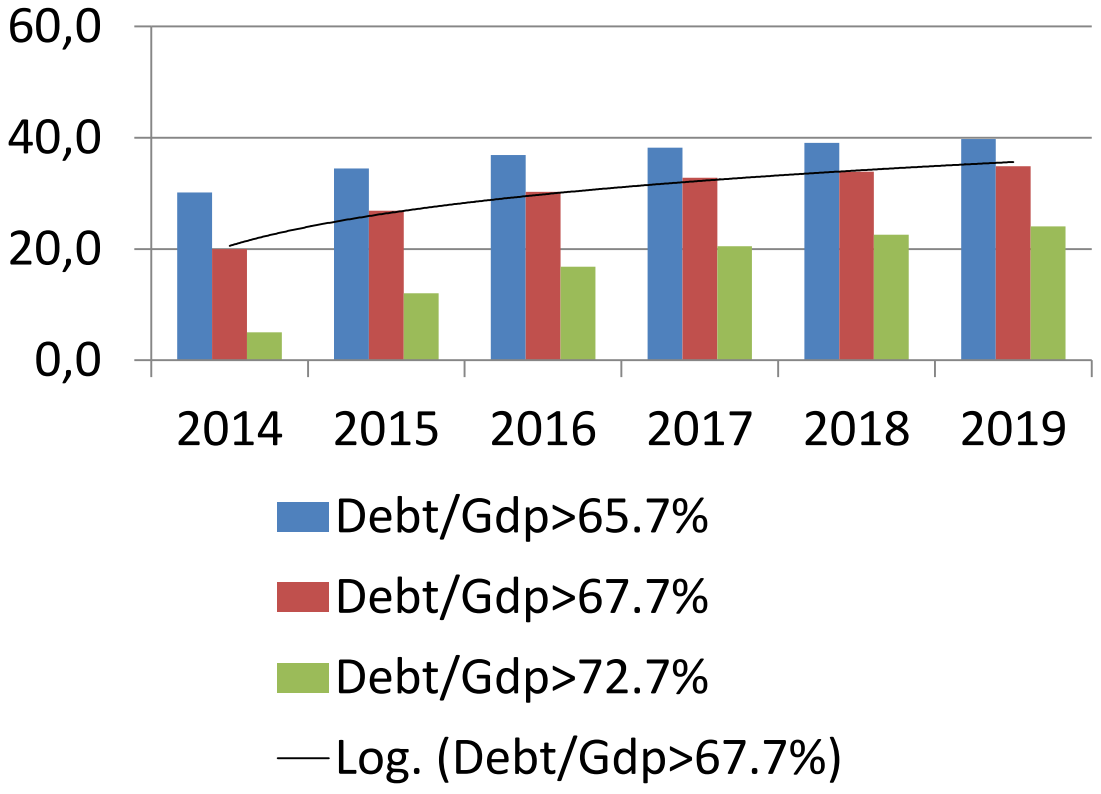


# Fan Chart of Debt to GDP Ratio for Tunisia with Cholesky decomposition (Morocco)

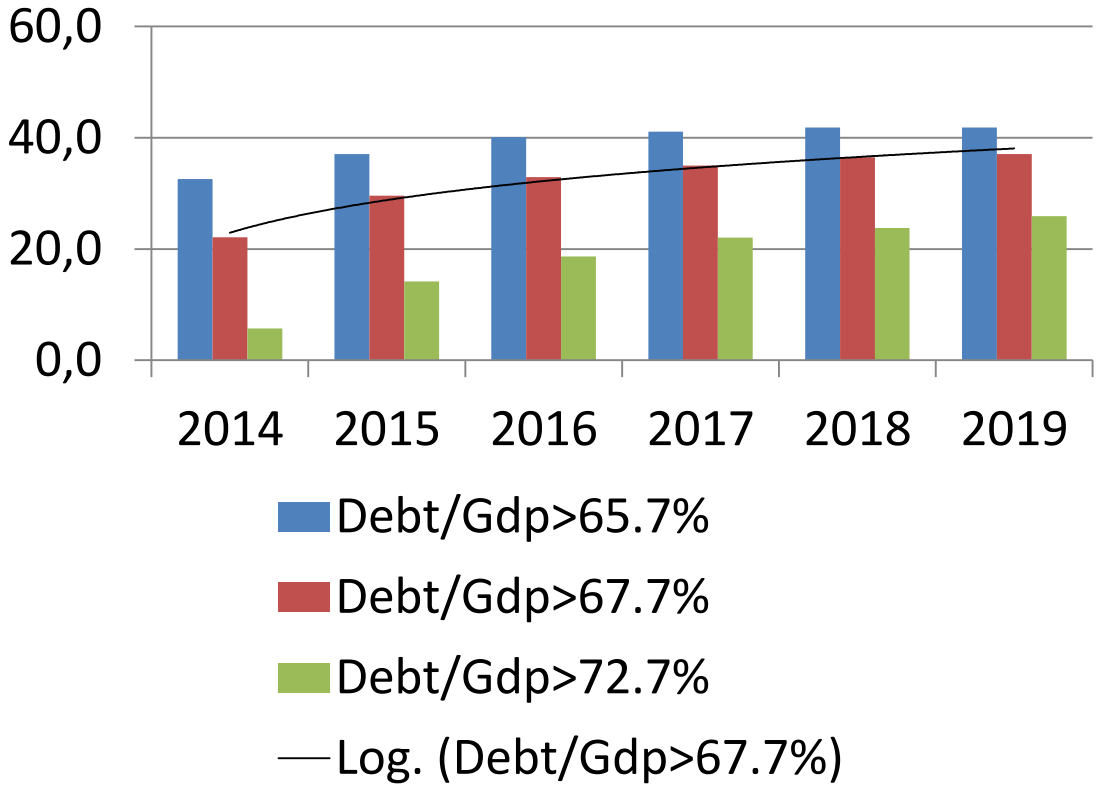


# Increasing Risk of hight Debt ratio if historial scenario held ( Morocco)

**No correlation**

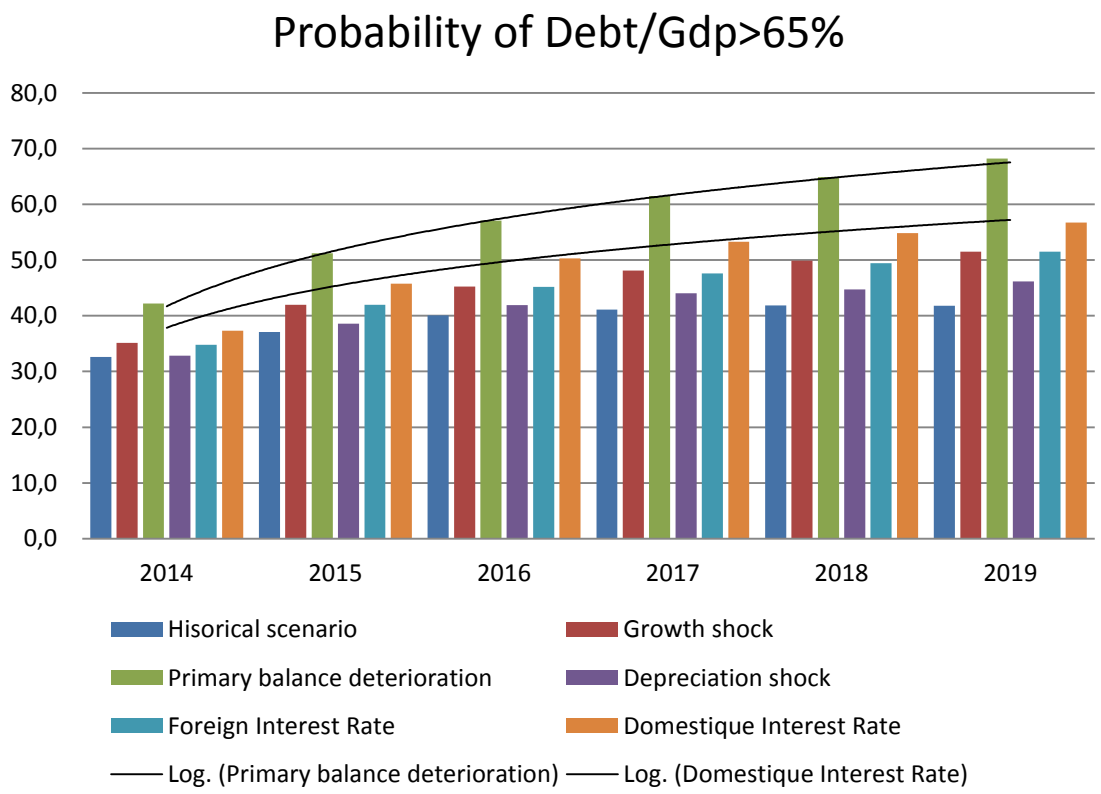


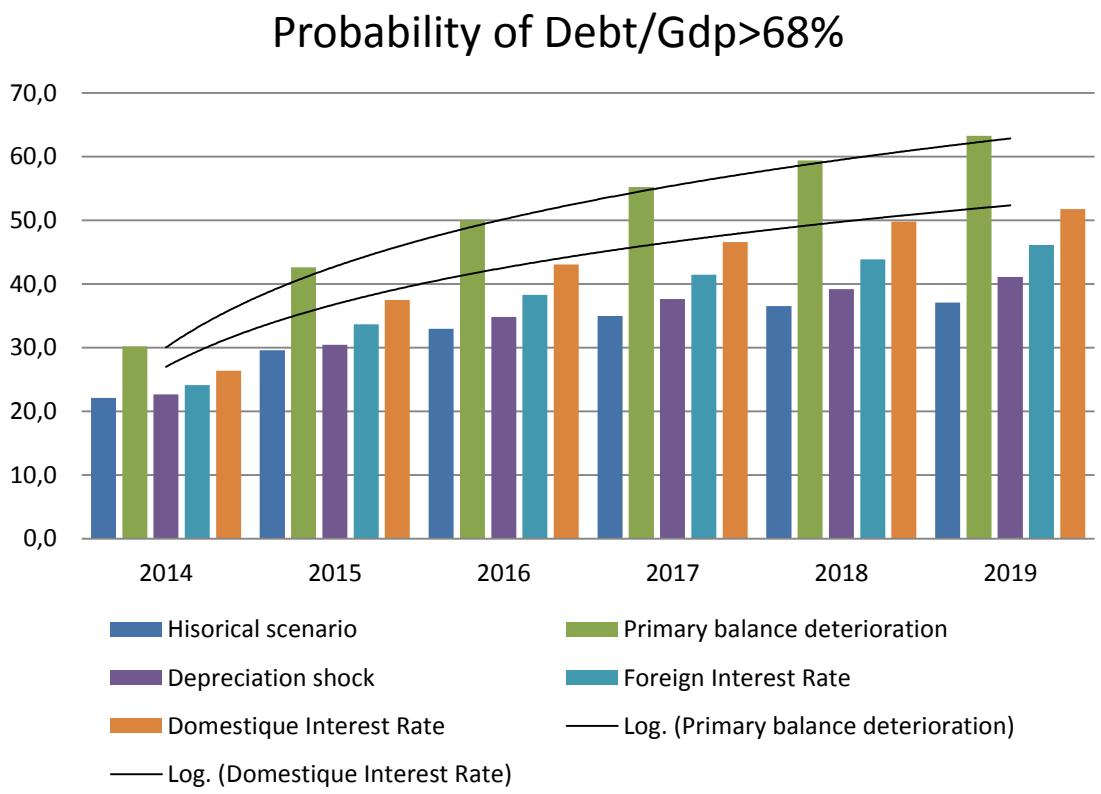

**Cholesky Decomposition**



# High Risks following macroeconomic shocks (Morocco)

## Growth and primary balances are important



# Results

- By damaging growth and increasing social expenses, the Arab Spring has put public debt sustainability once again high on the North Africa Countries in Transition's (NACTs) policy agenda.
- Applying a backward and forward sustainability analysis based on 'stabilizing primary balance approach' and Monte Carlo simulations is interesting for understanding debt vulnerabilities
- *Forward Debt Sustainability Analysis shows the Moroccan and Tunisian debt levels to be resilient to various shocks, and vulnerabilities linked to the profile of the debt appear moderate.*
- *However, under **primary balance** shocks, gross financing needs for Tunisia and Morocco would increase highlighting some risks despite the relatively moderate level of debt.*

- The main driver of sustainability is **growth outlook**, and **fiscal consolidation**.
- This underscoring the importance of **economic recovery** and even accelerating growth.
- **Fiscal consolidation** as well as utilizing the borrowing space for growth enhancing will need to play a greater role in maintaining debt sustainability in the future.

# Conclusion

1. Restoring debt to sustainable levels over the medium

term will require raising the primary fiscal balance and Growth

1. Fiscal consolidation will require structural reforms over the medium term.
2. For countries with low fiscal or external buffers, delays in Consolidation could heighten concerns about Debt sustainability.
3. Current account deficits and financing needs are substantial in many NACTs. How Much?
4. Role of MFIs in supporting NACT's. Where to borrow? How to borrow?

# Thanks