



# Central Bank of Iceland

The Icelandic banking collapse: was the optimal policy path chosen?”

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# Overview



The crisis and response

Methodology of the study

Key assumptions of the four scenarios:

1. Going for growth
2. Tough medicine
3. Private to public
4. Full Monty

PSV model: theory and results

QMM model: structure and results

Conclusions



# The crisis and response

# Important ingredients of the crisis



## The boom (2003-2007)

- GDP growth was high and unemployment low.
- Government ran *surpluses* and had low *debt*.
- Icelandic banks hugely increased their *cross-border activities*.
- With asset prices booming, households and firms expanded their *ISK and foreign currency debts*.
- Central Bank raised *interest rates* to maintain price stability, with the ISK strengthening on the fx market.
- *ISK assets of foreigners* expanded rapidly.
- Landsbanki attracted *ICESAVE deposits* in UK & Netherlands.

# The Icelandic banking collapse



## The crash (2008)

- Almost 90% of the financial sector collapsed in October.
- The on-shore foreign exchange market collapsed.
- A deep recession was unfolding.
- The fiscal deficit and public sector debt were surging.
- Policy makers were faced with a major challenge to identify best way out of the crisis.

# Policy issues



1. The banks: to resurrect or resolve?
2. Icesave dispute: to negotiate or litigate?
3. ISK overhang: to free or restrict?
4. Households: how to minimize welfare loss?

Above issues had potential to affect the course of fiscal policy and the sustainability of government finances for a long time.

# Policy framework



- Two instruments: fiscal policy ( $g$ ) and capital controls ( $c$ )
- Three objectives: growth ( $y$ ), unemployment ( $u$ ) and macroeconomic stability, gauged by the interest rate ( $i$ ).
- Government minimizes the welfare loss function:

$$W = W(y_T - y, u, i)$$

where  $y_T$  is the output target, using instruments  $g$  and capital controls. As unemployment and output are not orthogonal (i.e.  $u = f(y)$ ), we have two instruments and (ultimately) two goals.

- Examine what combination of  $g$  and  $c$  minimizes  $W$ .

# Policy response to the crisis in 2008



## *Emergency legislation enacted on Oct. 6*

- Old banks entered into a resolution process.
- New domestic banks erected and their deposits guaranteed.

## *IMF Stand-by Arrangement agreed on Nov. 25*

### a. Main objectives

- Prevent a further sharp ISK depreciation with capital controls
- Medium-term fiscal consolidation strategy to return the revenue balance into surplus by 2014, with automatic stabilisers allowed to operate in full in 2009.
- Develop a restructuring strategy for domestic banking system

### a) Financial backstops

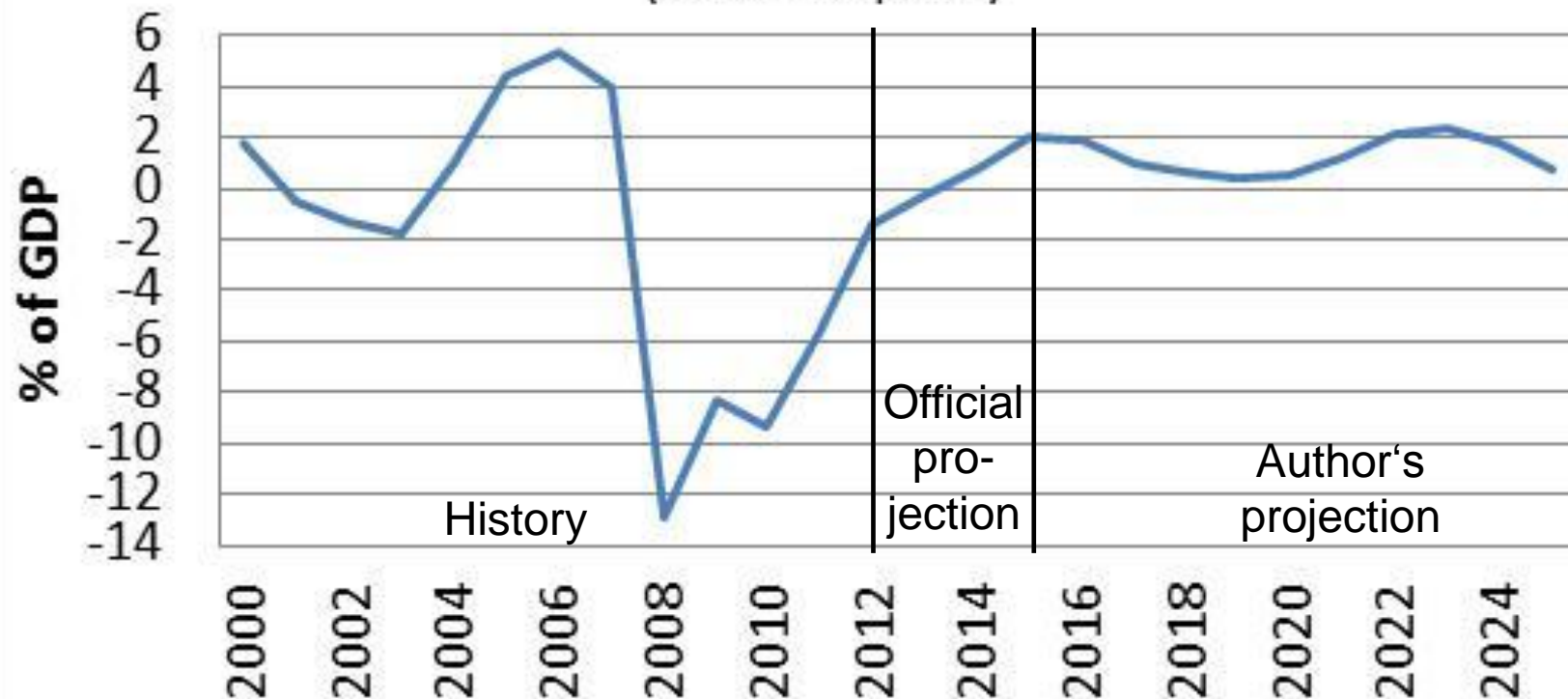
- Iceland received \$4,6 bn in loans from IMF & neighboring countries



# Baseline path for fiscal policy



## Gen. Government Revenue Balance (Baseline path)



Source: QMM model results

# Four scenarios considered



## 1. Going for growth

- Apply fiscal policy in a more counter-cyclical manner

## 2. Tough medicine

- No capital controls and a slightly more restrictive fiscal policy

## 3. Private to public

- Pay for Icesave up front on basis of Icesave I

## 4. Full Monty

- Resurrect the banks based on the Irish approach



# Methodology of the study

# Methodology of study



- **Baseline**

- Actual economic and financial developments through 2012. Official projections 2013-15. Author's projections 2016-25.

- **Scenarios**

- Fiscal policy and exchange rate are exogenous inputs.
- Author's projections 2008.4-2025.4.

- **PSV model results**

- Long term interest rates, economic growth and public debt.

- **QMM model results**

- QMM short term rates a function of PSV long term rates.
- Input other policy assumptions and obtain projections.
- Long run GDP growth rates constrained by PSV results.



# Key assumptions

# Overview of main assumptions



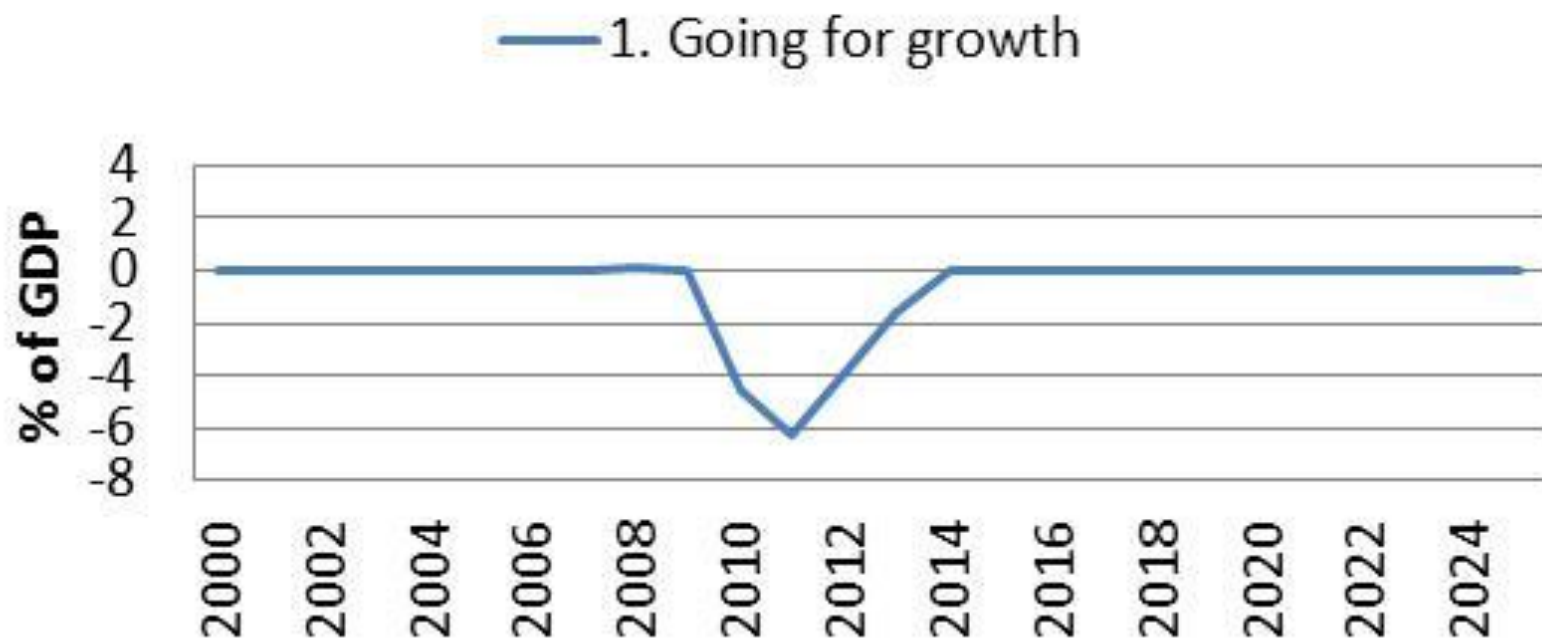
|                            | <i>Baseline</i>                           | <i>1. Going for growth</i>            | <i>2. Tough medicine</i>              | <i>3. Private to Public</i>     | <i>4. Full Monty</i>                           |
|----------------------------|---|---------------------------------------|---------------------------------------|---------------------------------|--|
| <i>Capital controls</i>    | <i>Yes</i>                                | <i>Yes</i>                            | <i>No</i>                             | <i>Yes</i>                      | <i>Yes</i>                                     |
| <i>Bank rescue</i>         | <i>Domestic</i>                           | <i>Domestic</i>                       | <i>Domestic</i>                       | <i>Domestic</i>                 | <i>Foreign &amp; domestic (Irish solution)</i> |
| <i>Icesave liabilities</i> | <i>No payment</i>                         | <i>No payment</i>                     | <i>No payment</i>                     | <i>Payment as per Icesave I</i> | <i>Payment equivalent to Icesave III</i>       |
| <i>Fiscal policy</i>       | <i>Consolidation as per IMF agreement</i> | <i>Less restrictive than baseline</i> | <i>More restrictive than baseline</i> | <i>Baseline + Icesave costs</i> | <i>Baseline + Icesave &amp; rescue costs</i>   |



# 1. Going for growth

# Growth stimulus: cumulative -16% of GDP deviation from baseline 2008-2014

## General government revenue balance (Difference from baseline)



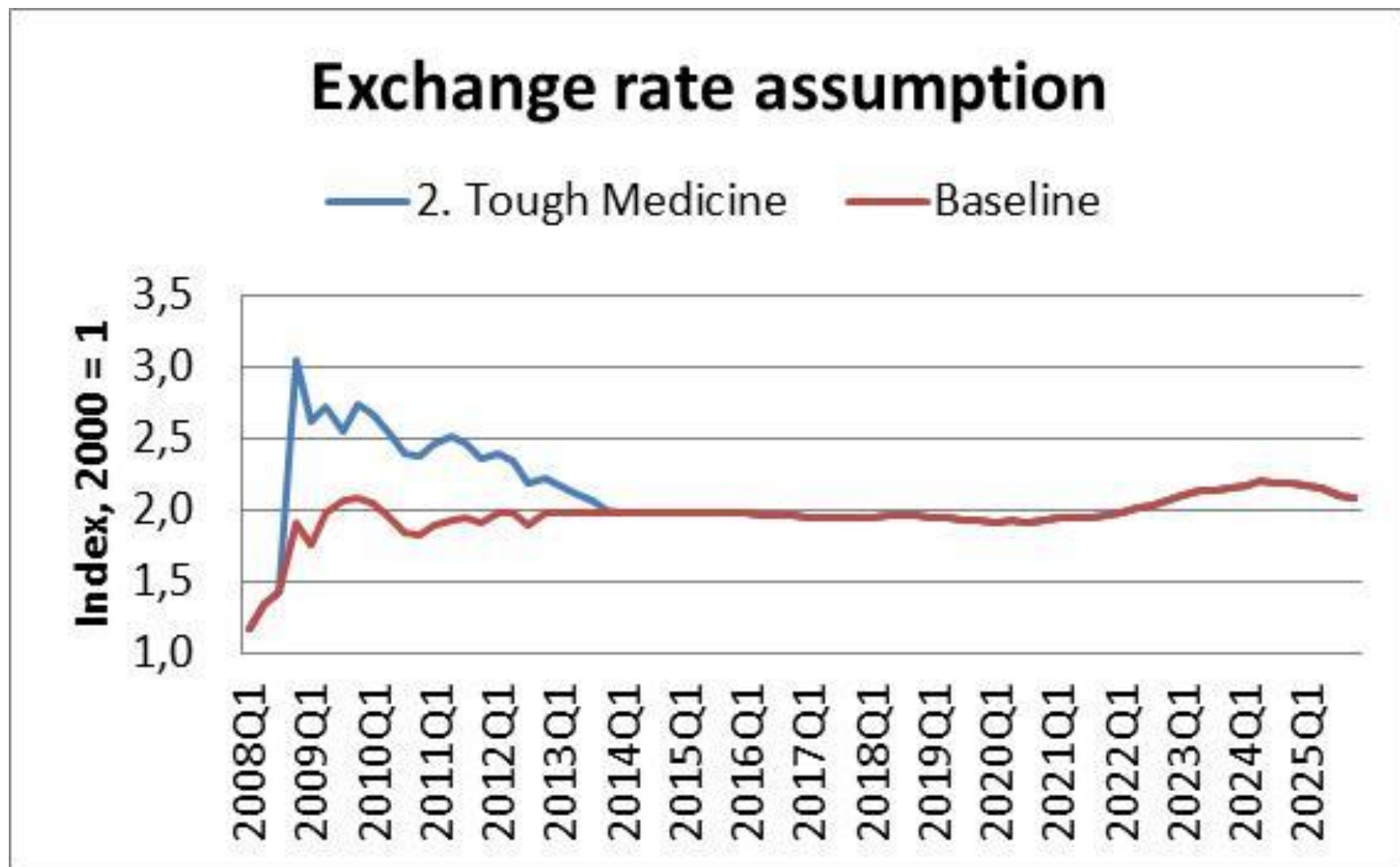
Source: QMM model results





## 2. Tough medicine

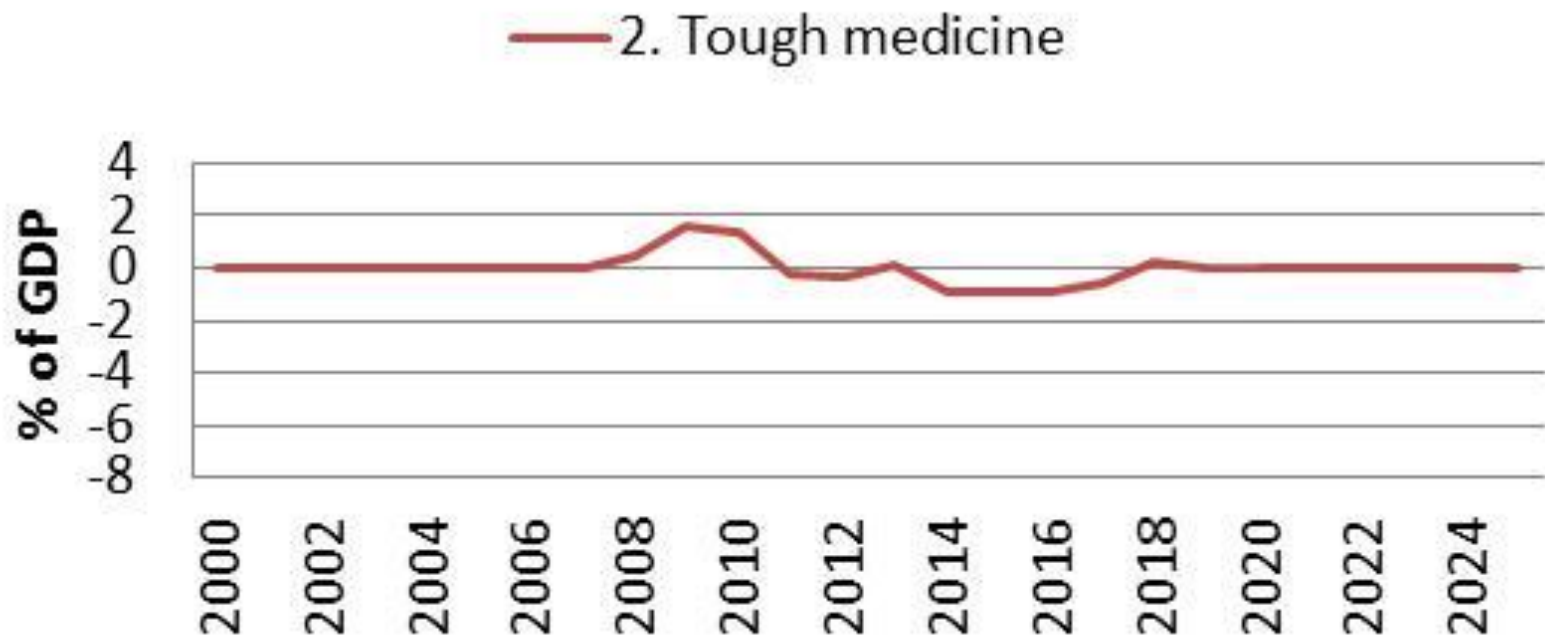
Without capital controls, value of ISK drops sharply but converges to baseline over time



# Front-loaded consolidation. 1% of GDP cumulative deviation from baseline, 2008-2017



## General government revenue balance (Difference from baseline)



Source: QMM model results

## 3. Private to public

# Icesave deposit guarantee dispute



- Landsbanki opened up Icesave accounts in UK and Netherlands from 2006.
- Around €4,5 billion were on deposit when a run on Icesave accounts took place in October 2008.
- With fx reserves of € 2,5 billion, Iceland was unable to guarantee the Icesave deposits.
- Landsbanki estate to cover deposits in foreign branches.
- Icelandic government declared all deposits (denominated in ISK) in the “new banks” protected.
- UK and Netherlands decided to pay the deposits and demanded restitution plus interest on the “loan”.

# Icesave agreements



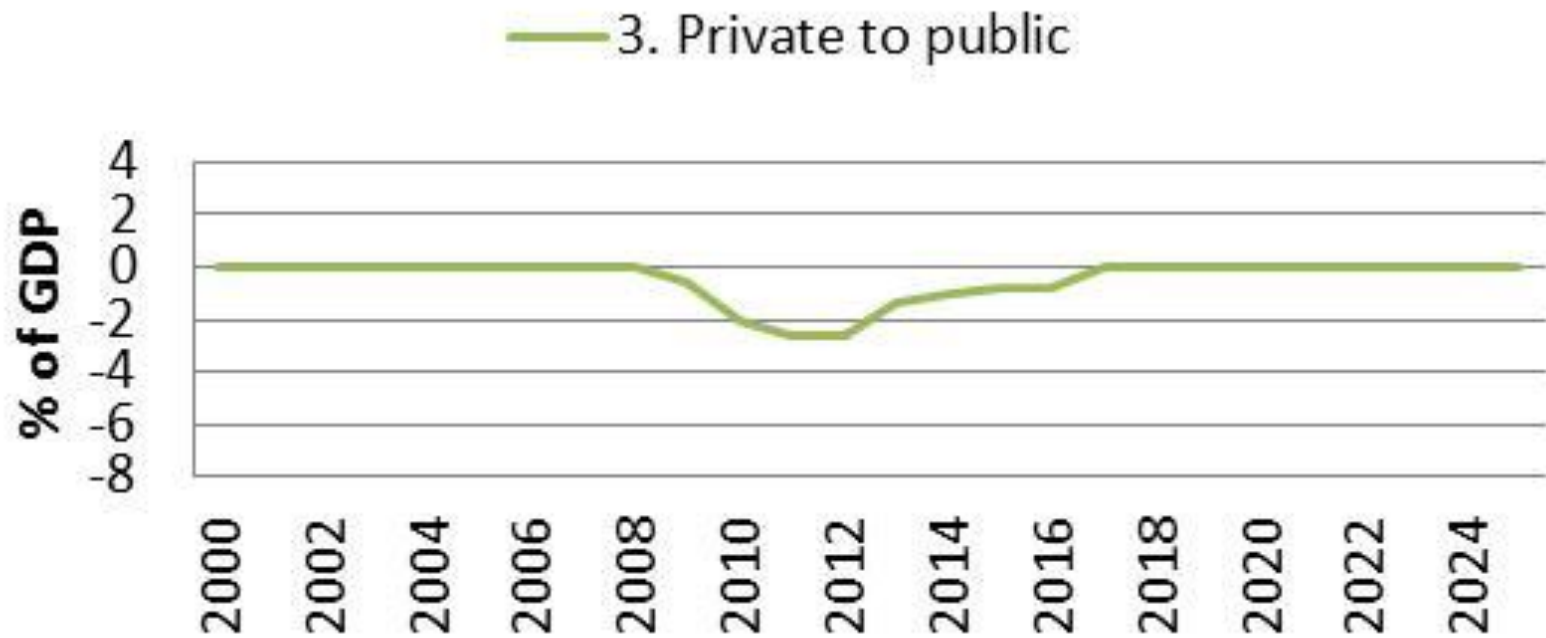
1. Icesave I agreement amounted to interest costs of around 12% of GDP. It was not concluded.
2. Icesave II & III agreements reduced this cost, by one-third and two-thirds, respectively.
3. Icesave II & III were rejected in national referendums.
4. EFTA Court case against Iceland was initiated in 2012.
5. In early 2013 the case against Iceland was dismissed.
6. In scenario 3 it is assumed the government pays the interest cost from 2009 as per Icesave I.

# Icesave I: -12% of GDP deviation, 2008-2016



## General government revenue balance

(Difference from baseline)



Source: QMM model results



## 4. Full Monty



# Too big to save



- Private banks had assets and liabilities in excess of 10x GDP, with 2/3 of balance sheet in foreign currencies.
- FX reserves amounting to 1/3 x GDP, thus the Icelandic government could not refinance the banking system.
- In absence of international cooperation, forced downsizing through resolution and winding-up was only option.
- Foreign creditors lost a substantial amount of claims in foreign currency.

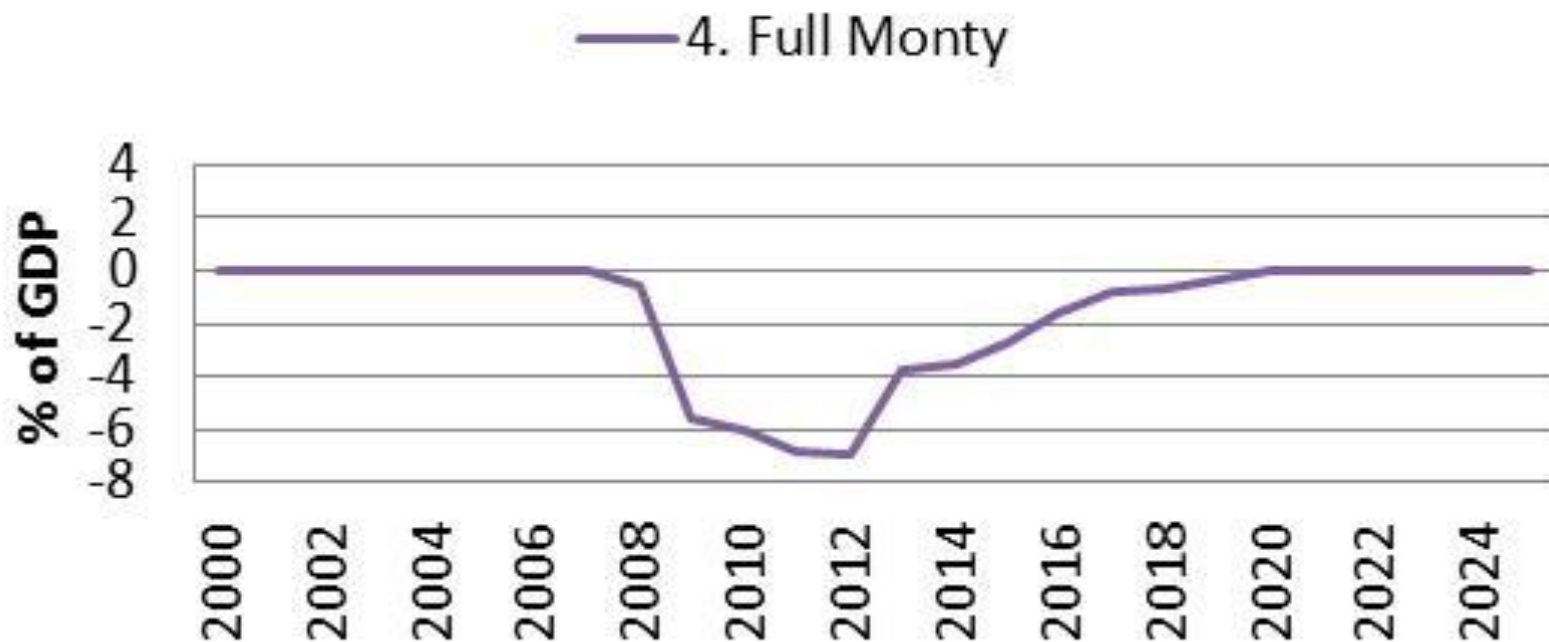
# Rescuing the banks



- Assume a cooperative solution to keep banks afloat, but with creditor participation, or “bail-in”.
- Cost is split 1/3 for Iceland and 2/3 for EU.
- Interest costs equivalent to Icesave III included.
- Banking systems in Iceland and Ireland were of comparable size relative to economy before the crisis
- Assume similar fiscal burden to that of the Irish rescue.
- Assume same exchange rate profile as in baseline (unlike Ireland)

# Bank rescue: cumulative -40% of GDP deviation from baseline, 2008-2019

## General government revenue balance (Difference from baseline)



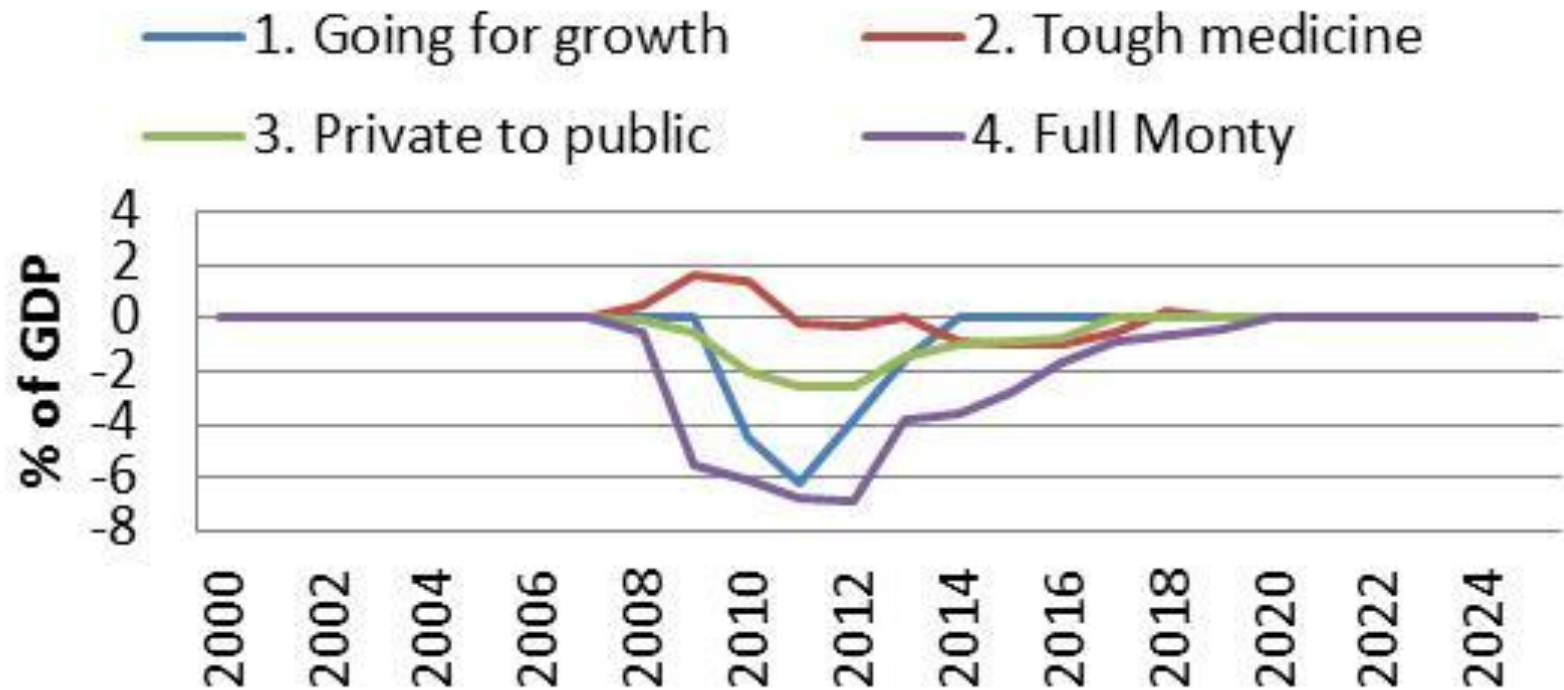
Source: QMM model results

# Overview of fiscal policy in the 4 scenarios



## General government revenue balance

(Difference from baseline)



Source: QMM model results



# PSV model

(see accompanying slides by Paul van den Noord)



# QMM model

# QMM model characteristics



- Short-to medium-term orientation
  - *one-sector* macro model with 128 equations (medium-sized)
  - based on empirically *estimated* error-correction relationships
  - uses *quarterly* observations
  - focused on *inflation* dynamics
  - used to underpin *monetary policy* decisions
- A dynamic model
  - changes in the *output gap* are a critical element in the model
  - *exchange rate* changes are important
  - role of *judgement* in projections is non-trivial
  - the bigger the *shock* the greater the perturbation
  - limited convergence to a *long run growth path*



# Results



# Key results



## Table 1. GDP growth

|                      | QMM result        |                   |                   | Difference from Baseline |                   |                   |
|----------------------|-------------------|-------------------|-------------------|--------------------------|-------------------|-------------------|
|                      | 2008.4-<br>2013.4 | 2014.1-<br>2025.4 | 2008.4-<br>2025.4 | 2008.4-<br>2013.4        | 2014.1-<br>2025.4 | 2008.4-<br>2025.4 |
| Baseline             | -0,5%             | 3,3%              | 2,1%              | -                        | -                 | -                 |
| 1. Going for growth  | 0,1%              | 2,7%              | 1,9%              | 0,7%                     | -0,5%             | -0,2%             |
| 2. Tough medicine    | -3,7%             | 4,6%              | 2,1%              | -3,2%                    | 1,3%              | 0,0%              |
| 3. Private to public | -0,7%             | 3,0%              | 1,9%              | -0,1%                    | -0,2%             | -0,2%             |
| 4. Full Monty        | -0,7%             | 2,6%              | 1,6%              | -0,1%                    | -0,6%             | -0,5%             |

## Table 2. Unemployment rate

|                      | QMM result        |                   |                   | Difference from Baseline |                   |                   |
|----------------------|-------------------|-------------------|-------------------|--------------------------|-------------------|-------------------|
|                      | 2008.4-<br>2013.4 | 2014.1-<br>2025.4 | 2008.4-<br>2025.4 | 2008.4-<br>2013.4        | 2014.1-<br>2025.4 | 2008.4-<br>2025.4 |
| Baseline             | 6,7%              | 3,9%              | 4,8%              | -                        | -                 | -                 |
| 1. Going for growth  | 6,6%              | 4,2%              | 4,9%              | -0,1%                    | 0,2%              | 0,1%              |
| 2. Tough medicine    | 8,9%              | 3,5%              | 5,2%              | 2,2%                     | -0,4%             | 0,4%              |
| 3. Private to public | 6,8%              | 4,3%              | 5,1%              | 0,1%                     | 0,4%              | 0,3%              |
| 4. Full Monty        | 6,9%              | 4,1%              | 5,0%              | 0,2%                     | 0,2%              | 0,2%              |

# Key results



**Table 3. Consumer price inflation**

|                      | QMM result        |                   |                   | Difference from Baseline |                   |                   |
|----------------------|-------------------|-------------------|-------------------|--------------------------|-------------------|-------------------|
|                      | 2008.4-<br>2013.4 | 2014.1-<br>2025.4 | 2008.4-<br>2025.4 | 2008.4-<br>2013.4        | 2014.1-<br>2025.4 | 2008.4-<br>2025.4 |
| Baseline             | 6,6%              | 2,3%              | 3,6%              | -                        | -                 | -                 |
| 1. Going for growth  | 7,6%              | 1,2%              | 3,1%              | 1,0%                     | -1,1%             | -0,5%             |
| 2. Tough medicine    | 0,3%              | -1,2%             | -0,7%             | -6,3%                    | -3,5%             | -4,3%             |
| 3. Private to public | 6,3%              | 0,7%              | 2,4%              | -0,3%                    | -1,7%             | -1,2%             |
| 4. Full Monty        | 6,6%              | -0,2%             | 1,9%              | 0,0%                     | -2,5%             | -1,8%             |

**Table 4. Long term interest rate**

|                      | PSV result        |                   |                   | Difference from Baseline |                   |                   |
|----------------------|-------------------|-------------------|-------------------|--------------------------|-------------------|-------------------|
|                      | 2008.4-<br>2013.4 | 2014.1-<br>2025.4 | 2008.4-<br>2025.4 | 2008.4-<br>2013.4        | 2014.1-<br>2025.4 | 2008.4-<br>2025.4 |
| Baseline             | 6,8%              | 7,1%              | 7,0%              | -                        | -                 | -                 |
| 1. Going for growth  | 6,9%              | 7,4%              | 7,2%              | 0,1%                     | 0,3%              | 0,2%              |
| 2. Tough medicine    | 11,6%             | 7,8%              | 9,0%              | 4,8%                     | 0,7%              | 2,0%              |
| 3. Private to public | 6,9%              | 7,3%              | 7,2%              | 0,1%                     | 0,3%              | 0,2%              |
| 4. Full Monty        | 7,0%              | 7,8%              | 7,6%              | 0,2%                     | 0,7%              | 0,6%              |

# Key results



Table 5. Misery index (excluding inflation/deflation)\*

|                      | QMM result        |                   |                   | Difference from Baseline |                   |                   |
|----------------------|-------------------|-------------------|-------------------|--------------------------|-------------------|-------------------|
|                      | 2008.4-<br>2013.4 | 2014.1-<br>2025.4 | 2008.4-<br>2025.4 | 2008.4-<br>2013.4        | 2014.1-<br>2025.4 | 2008.4-<br>2025.4 |
| Baseline             | 14,0%             | 7,8%              | 9,7%              | -                        | -                 | -                 |
| 1. Going for growth  | 13,4%             | 8,8%              | 10,3%             | -0,6%                    | 1,0%              | 0,6%              |
| 2. Tough medicine    | 24,2%             | 6,8%              | 12,1%             | 10,2%                    | -1,0%             | 2,4%              |
| 3. Private to public | 14,3%             | 8,6%              | 10,3%             | 0,3%                     | 0,8%              | 0,7%              |
| 4. Full Monty        | 14,5%             | 9,3%              | 10,9%             | 0,5%                     | 1,5%              | 1,2%              |

\*)  $u + i - y$ , where  $u$  = unemployment rate,  $i$  = long term interest rate and  $y$  = GDP growth rate

# Further insights from the QMM model



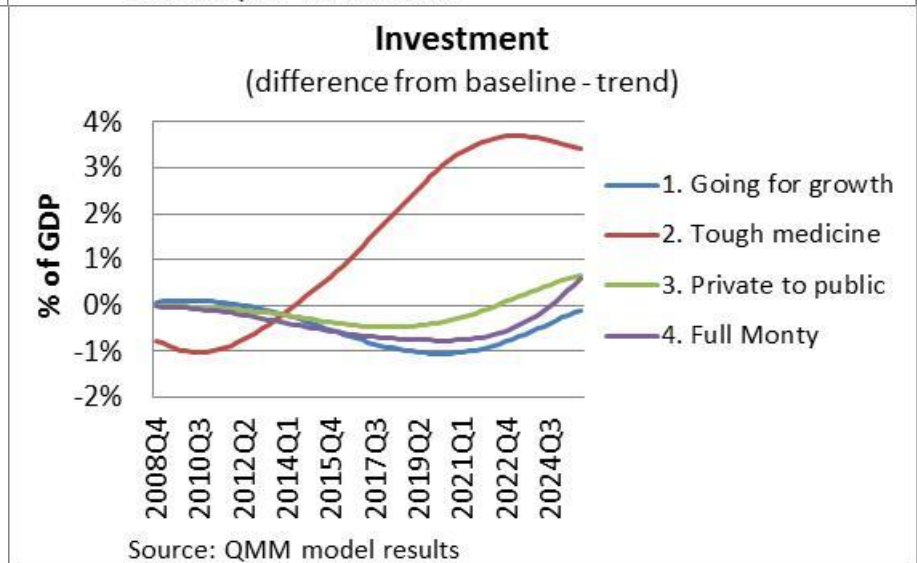
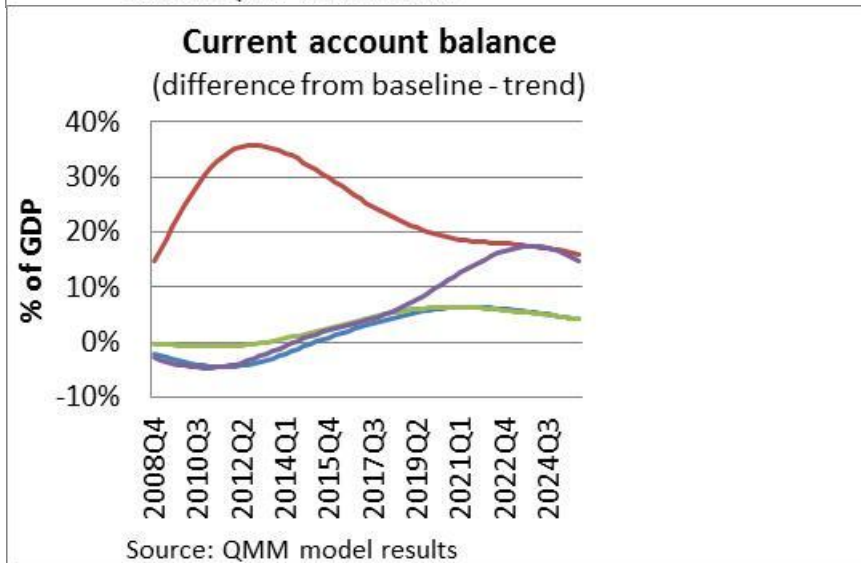
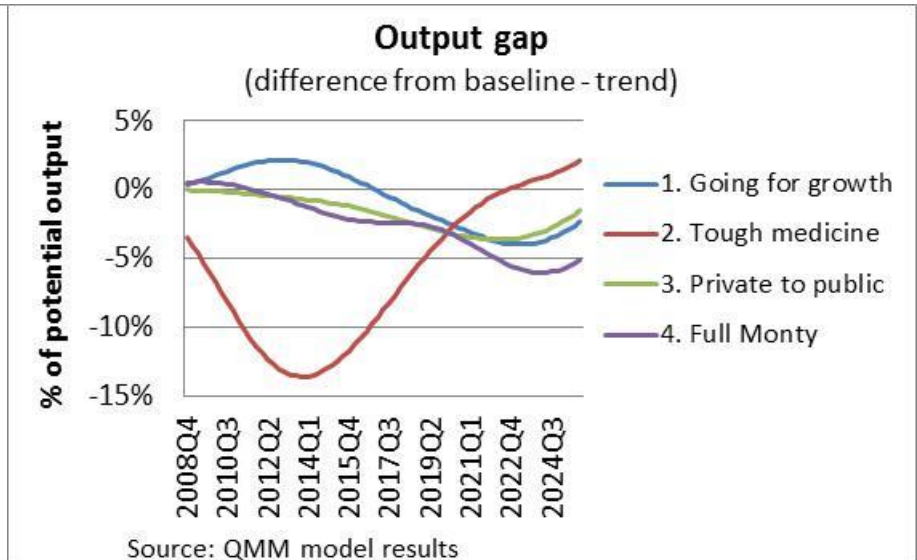
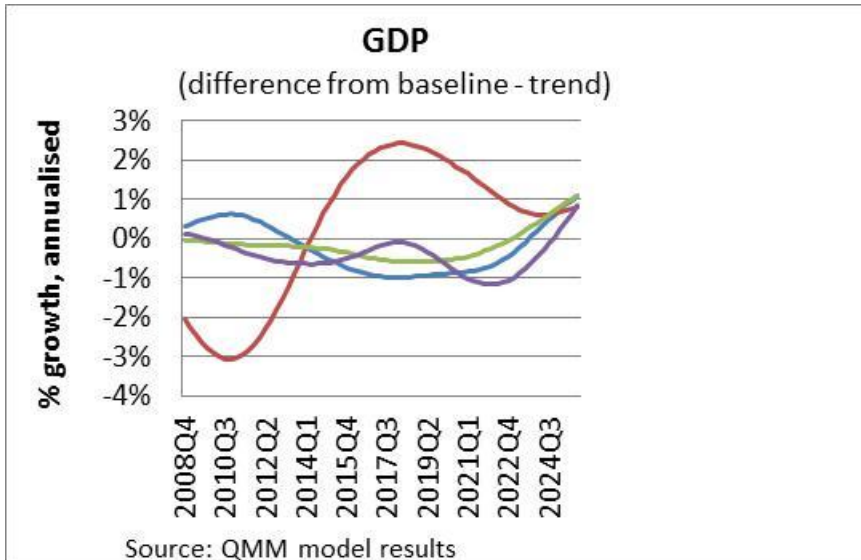
## More detailed insights

- greater number of variables (than in PSV model)
- welfare trade-offs:
  - between scenarios, and
  - between periods (inter-temporal)

## Nota bene

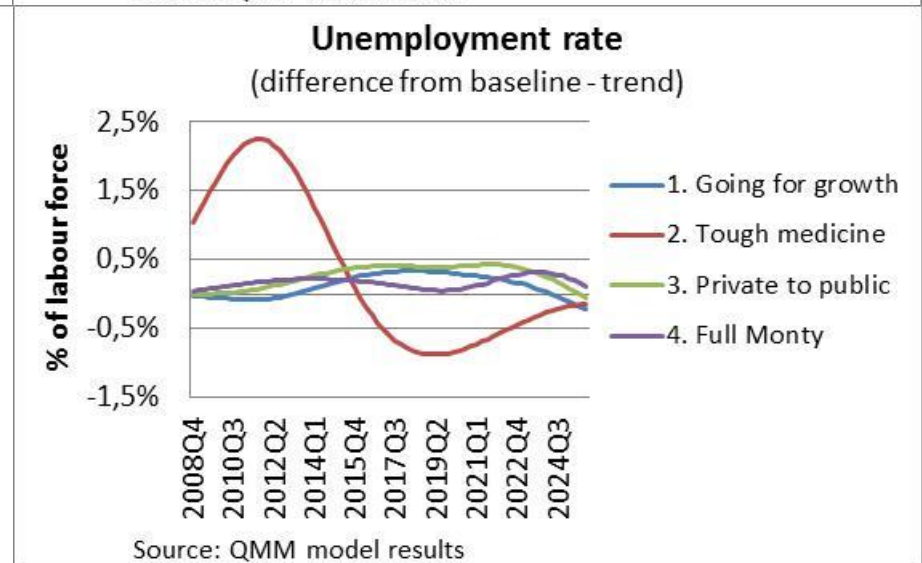
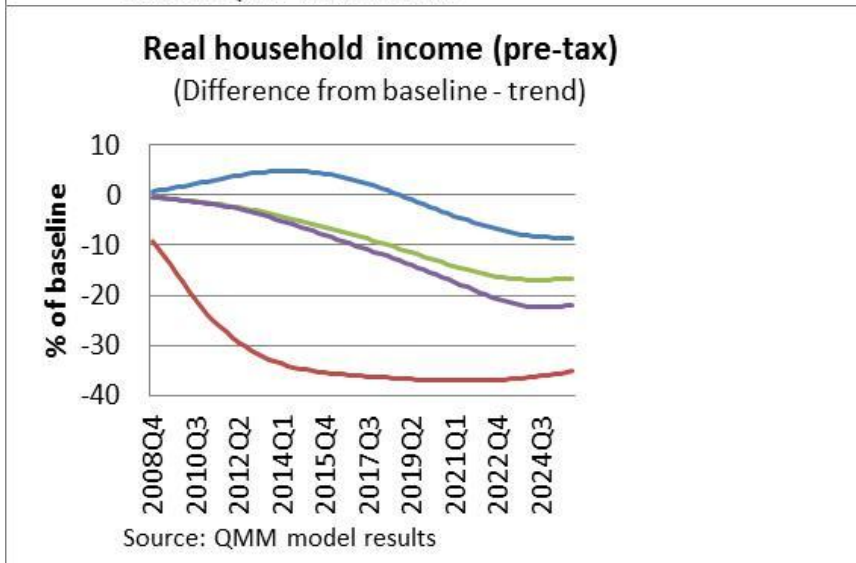
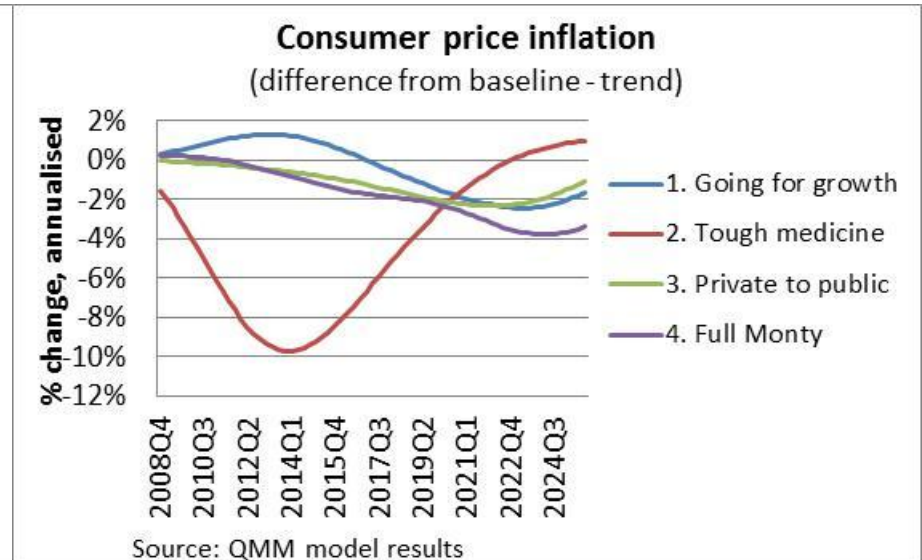
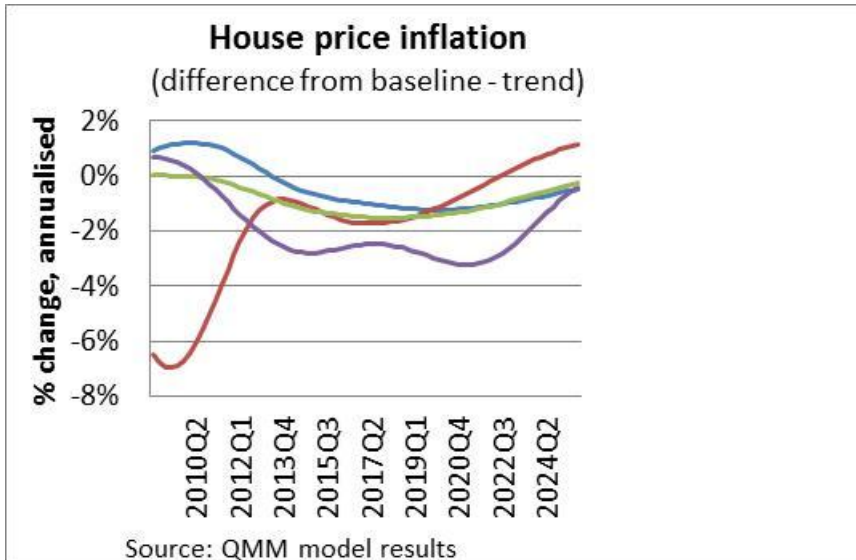
- Limited convergence to a steady-state path in long run
- Outcomes show model tendencies given the initial shock
- The largest shock is in scenario 2. Tough medicine followed by 4. Full Monty. Smallest shock is in 3. Private to public.

# Economic growth





# Inflation, income and unemployment



# Conclusions



- Public finances are sustainable in all scenarios but only if primary surpluses are maintained.
- Growth cost of different policies is significant.
  1. *Going for growth* shifts cost into the future.
  2. *Tough medicine* comes at great cost, although growth recovers from a lower level.
  3. *Private to public* would have been inferior but manageable.
  4. *Full Monty* is clearly a sub-optimal path.
- Alternatives are all inferior to the path taken.