Structural Reforms in a Debt Overhang

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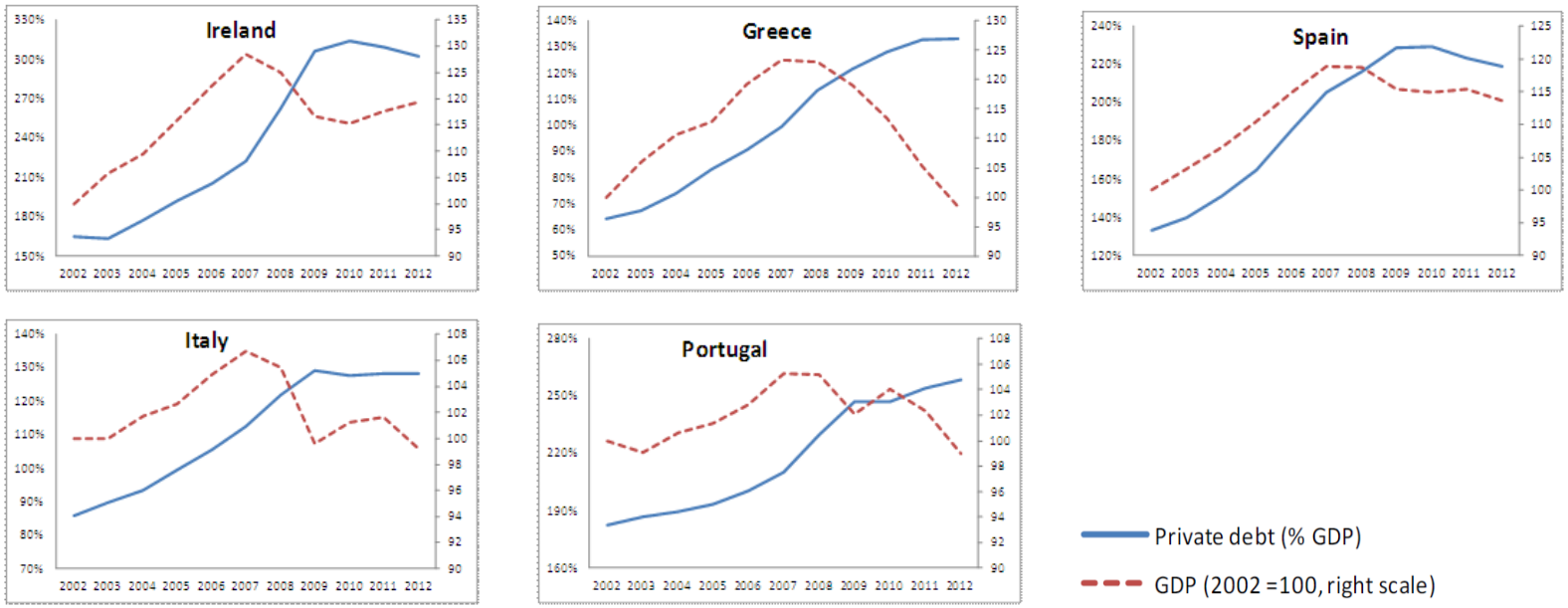
Motivation (I)

Two legacies of the crisis in periphery EMU countries: (i) high levels of private debt and (ii) low/negative growth



Motivation (II)

- In the short term, little room for
  - fiscal policy (large deficits)
  - (conventional) monetary policy (ZLB).
- Hence, much of the focus is on **structural reforms**, mainly in product and labour markets.
  - Most official views (e.g. OECD, IMF, EC...) support reforms.
- Reforms are clearly positive in the long run.
  - More competition$\longrightarrow$ *lower* prices, higher quantities and welfare
- But their short/medium term impact is less well understood.

What the recent literature says

Some recent work on the short-term impact of reforms highlights potential risks:

- Eggertsson, Ferrero & Raffo (2014):
  - if monetary policy is at ZLB, deflationary structural reforms increase real interest rate $\longrightarrow$ depress aggregate demand
  - this channel may dominate positive income effect (from long-run gains) in the short run
- Galí (2013) and Galí & Monacelli (2013) also warn about the previous negative deflationary channel
- Policy corollary: Postpone reforms until MP can help (i.e. out of the ZLB).
- EMU periphery conditioned by high debt *cum* slow deleveraging:
  - In this environment, short/medium run effects of reforms remain largely unexplored.

This paper

- Provide a DSGE model to study impact of **structural reforms** in an environment of **slow deleveraging**.
- Model builds on Iacoviello (2005)
  - lenders & borrowers, collateral constraints *à la* Kiyotaki & Moore (1997)
- Key point of departure: **long-term debt**
  $\Rightarrow$ slow and protracted deleveraging of private sector
  $\Rightarrow$ asymmetric debt limits and *endogenous* regime change
- Also **open economy** (important adjustment channel in the crisis)

Model structure

- Small open economy in a monetary union
  - $\Rightarrow$ monetary policy exogenous $\approx$ ZLB
- Three consumer types
  - Patient households (lenders)
  - Impatient households (borrowers)
  - Entrepreneurs (borrowers)
- Three production sectors
  - Consumption goods (entrepreneurs + retailers)
  - Equipment capital producers
  - Real estate construction
- Trade with rest of world: consumption goods and foreign debt
- Standard real and nominal frictions: investment adjustment costs, nominal price and wage rigidities

Financial frictions (I)

- Collateral constraints on (i) impatient households and (ii) entrepreneurs
- We assume *long-run debt* $\Rightarrow$ A constant fraction $1-\gamma$ of outstanding (nominal) principal is amortized each period (Woodford, 2001)
- Then the dynamics of *real* outstanding debt:

$$b_t = \underbrace{\frac{b_{t-1}}{\pi_t}}_{\text{initial debt}} - \underbrace{\frac{1-\gamma}{\pi_t} b_{t-1}}_{\text{amortization}} + \underbrace{b_t^{new}}_{\text{new gross flow}} = \frac{\gamma}{\pi_t} b_{t-1} + b_t^{new}.$$

Financial frictions (II)

- An *asymmetric debt-regime*:
  - In 'normal' times, positive gross credit flows ($b_t^{new} > 0$), with resulting debt level (b_t) constrained by the value of collateral

$$b_t \leq m_t \frac{1}{R_t} E_t \pi_{t+1} p_{t+1}^h h_t, \qquad (1)$$

    In equilibrium, eq. (1) holds as an equality and $\Delta b_t \gtrless 0$, depending on the fluctuations in the value of collateral between t and $t-1$.

  - In 'bad times', collateral values go down significantly (relative to pre-existing debt), and borrowers just pay back their debts at the contractual amortization rate,

$$b_t^{new} = 0, \qquad \text{and} \quad b_t = \frac{\gamma}{\pi_t} b_{t-1}$$

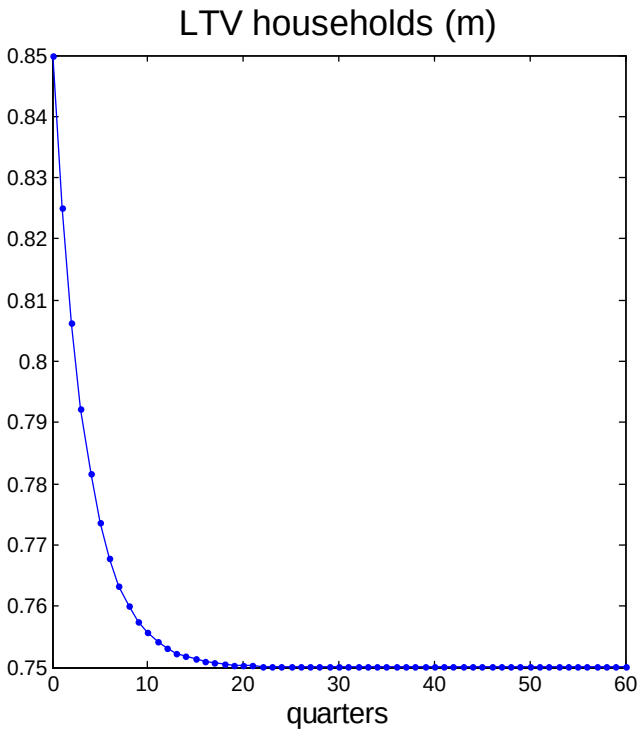
Financial frictions (III)

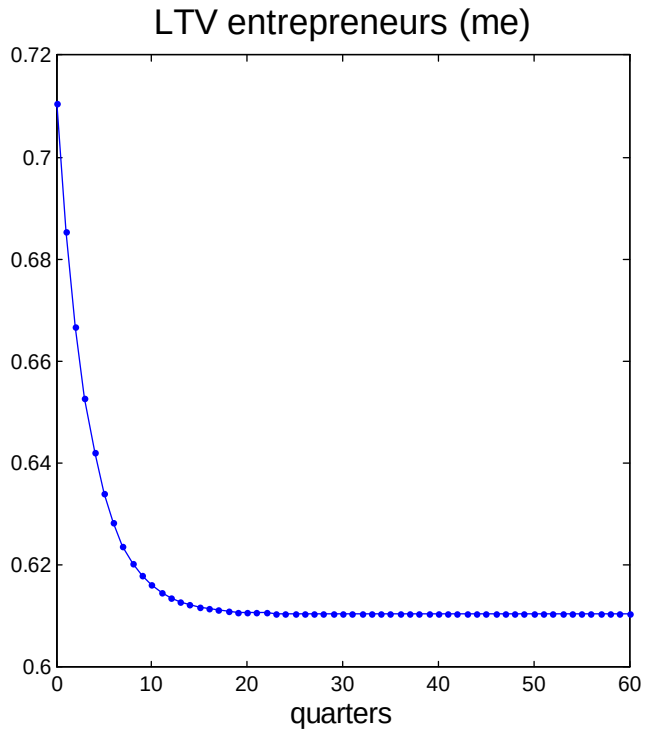
- Following a large deleveraging shock, the economy switches between *debt regimes*:
  - From a *normal regime* with debt limited by collateral values
  - To a *credit-crunch regime* with no new credit and outstanding debt gradually repaid
  - And back to a *normal regime*: "virtuous" investment-credit-growth cycle
- Time of last regime change is endogenously determined

Baseline scenario: a deleveraging shock

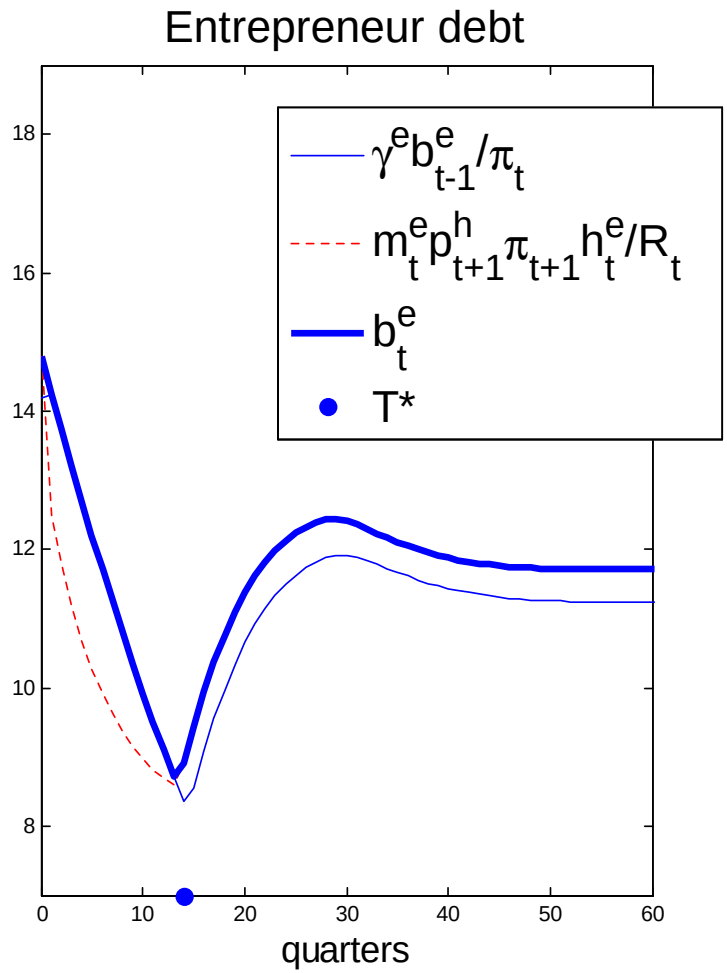
- We calibrate the model targeting some key ratios of Spanish economy in 2007 (initial condition)
- We simulate a *deleveraging* shock for entrepreneurs and constrained households:
  - Permanent fall (10pp) in loan-to-value (LTV) ratios
  - This shock generates a scenario of **slow, protracted deleveraging and long-lasting recession**

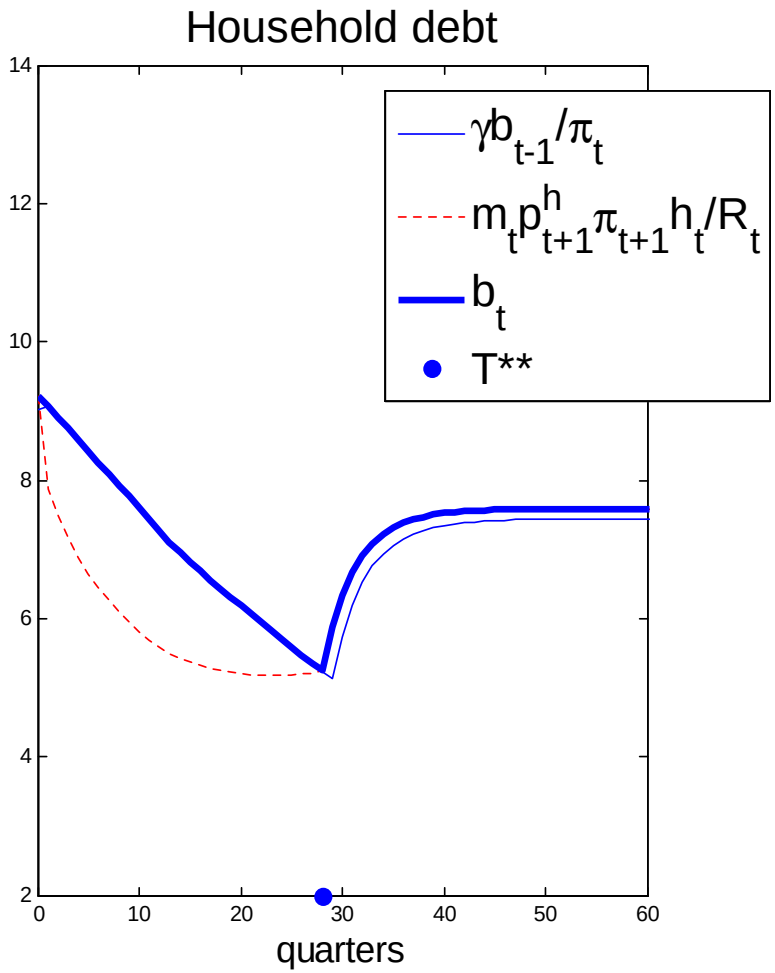
Deleveraging shock: LTV ratios



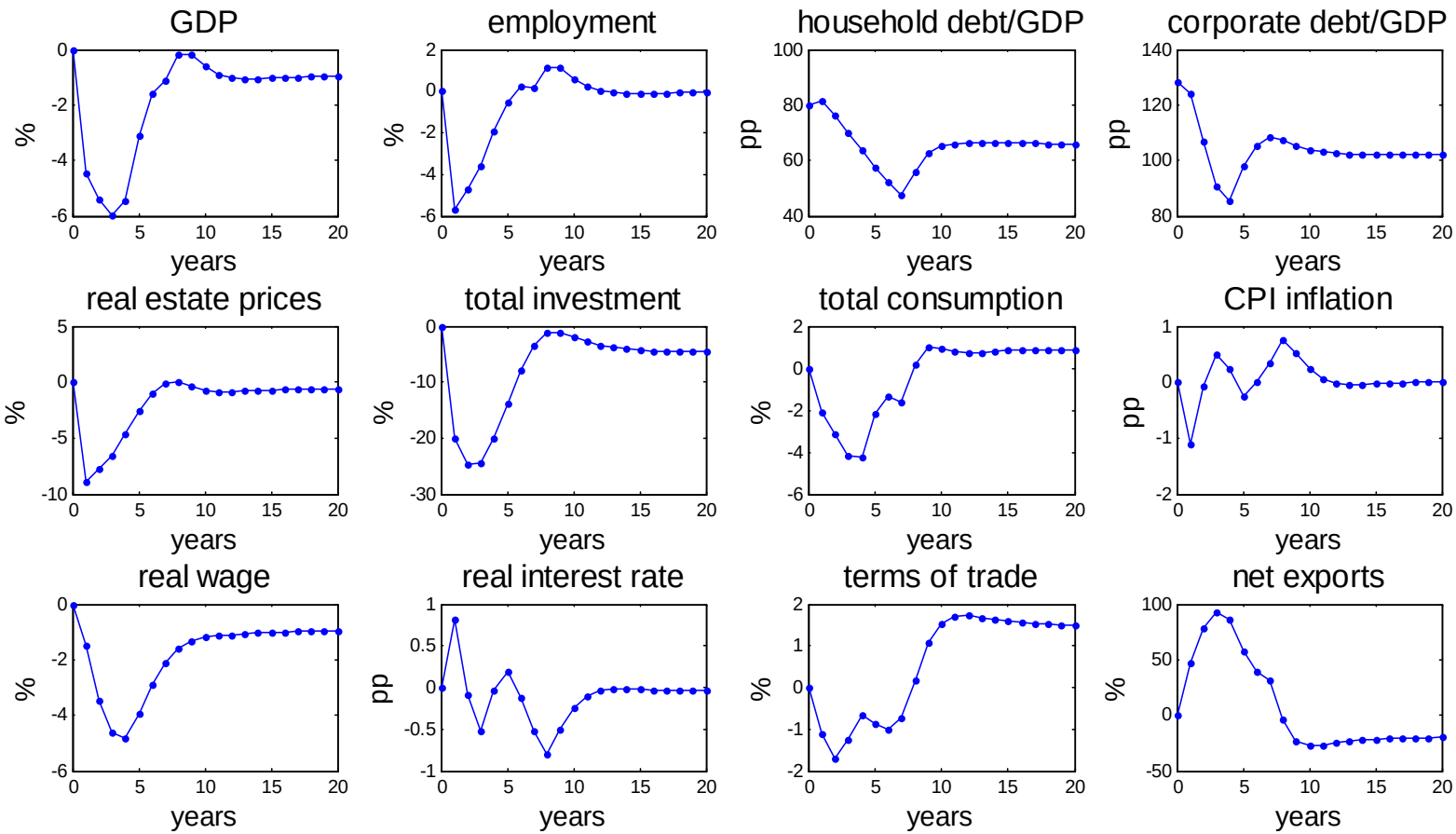


Deleveraging shock: regime changes



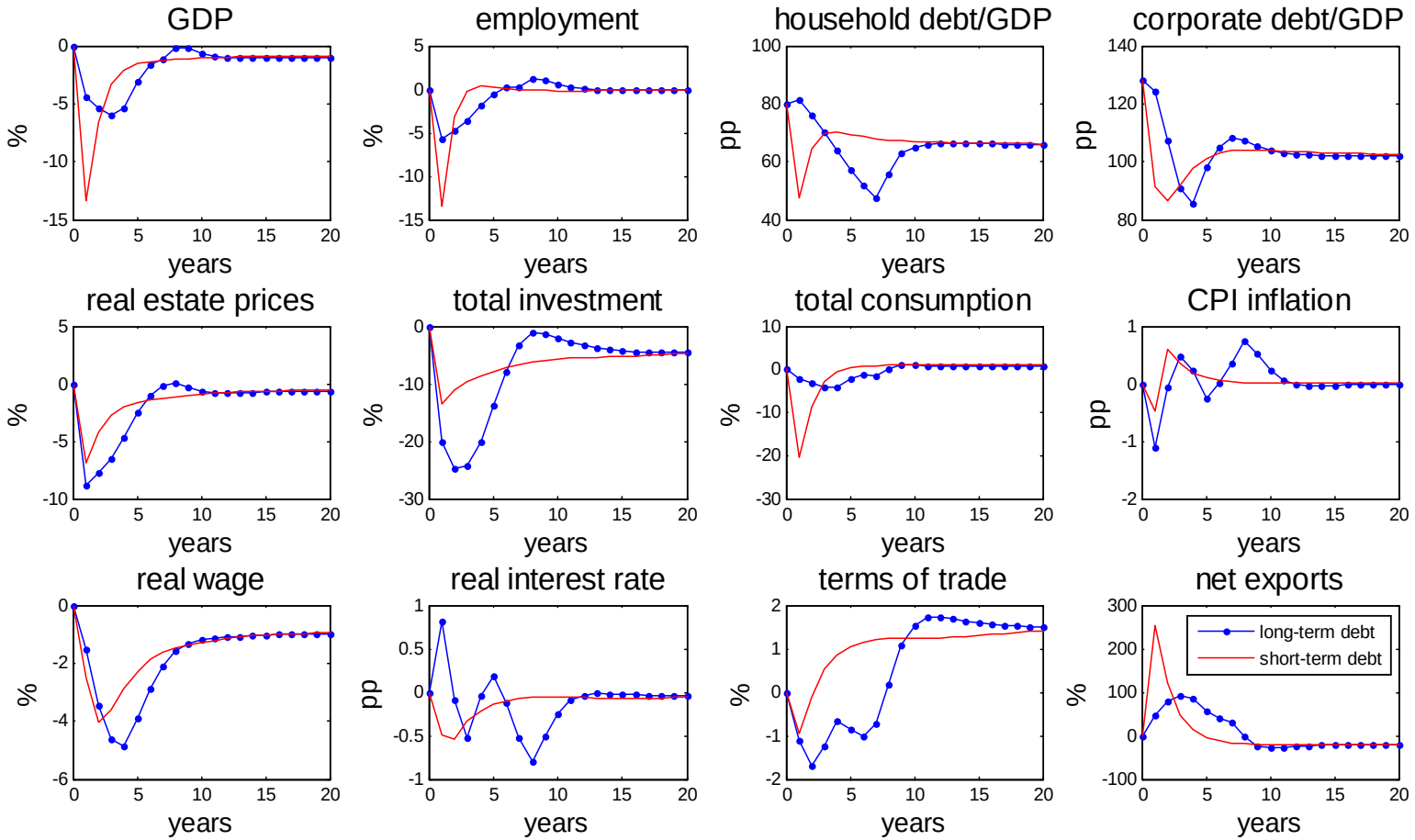


Deleveraging shock: macroeconomic effects



Deleveraging shock: long vs short-term debt

Model with long run debt produces a more realistic deleveraging path and (critically) allows for endogenous regime changes



Deleveraging shock

Debt, consumption and investment

- Two phases in the dynamics of debt:
  - Until T^* (T^{**}), slow deleveraging
  - After T^* (T^{**}), debt picks up quickly: real estate is again valuable as collateral $\Rightarrow$ asset prices, credit and investment "virtuous circle"
- Consumption follows a similar pattern to debt
- Investment recovers somewhat earlier than consumption and debt (more on this later!)

Deleveraging shock

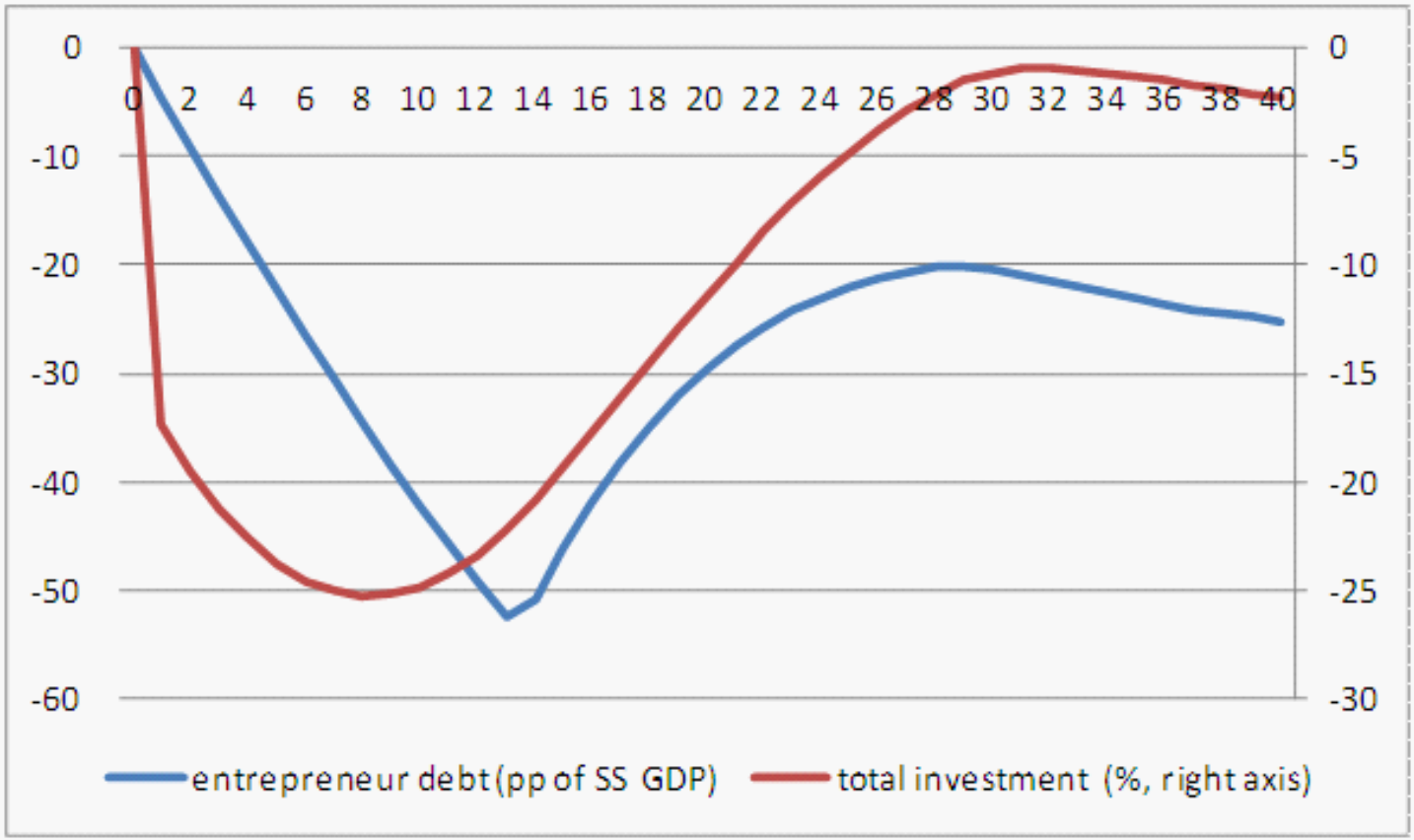
Foreign sector and labor market

- Net exports improve significantly, although not as much as to prevent the recession. Two effects at work:
  - Terms of trade depreciate $\longrightarrow$ exports increase.
  - Sharp domestic contraction reduces imports.
- Labor market:
  - Employment falls and it takes long to get back to pre-crisis value.
  - Falls in nominal and real wages, which are behind the favorable response of the terms of trade.

Deleveraging shock

Investment and debt: a 'creditless recovery'

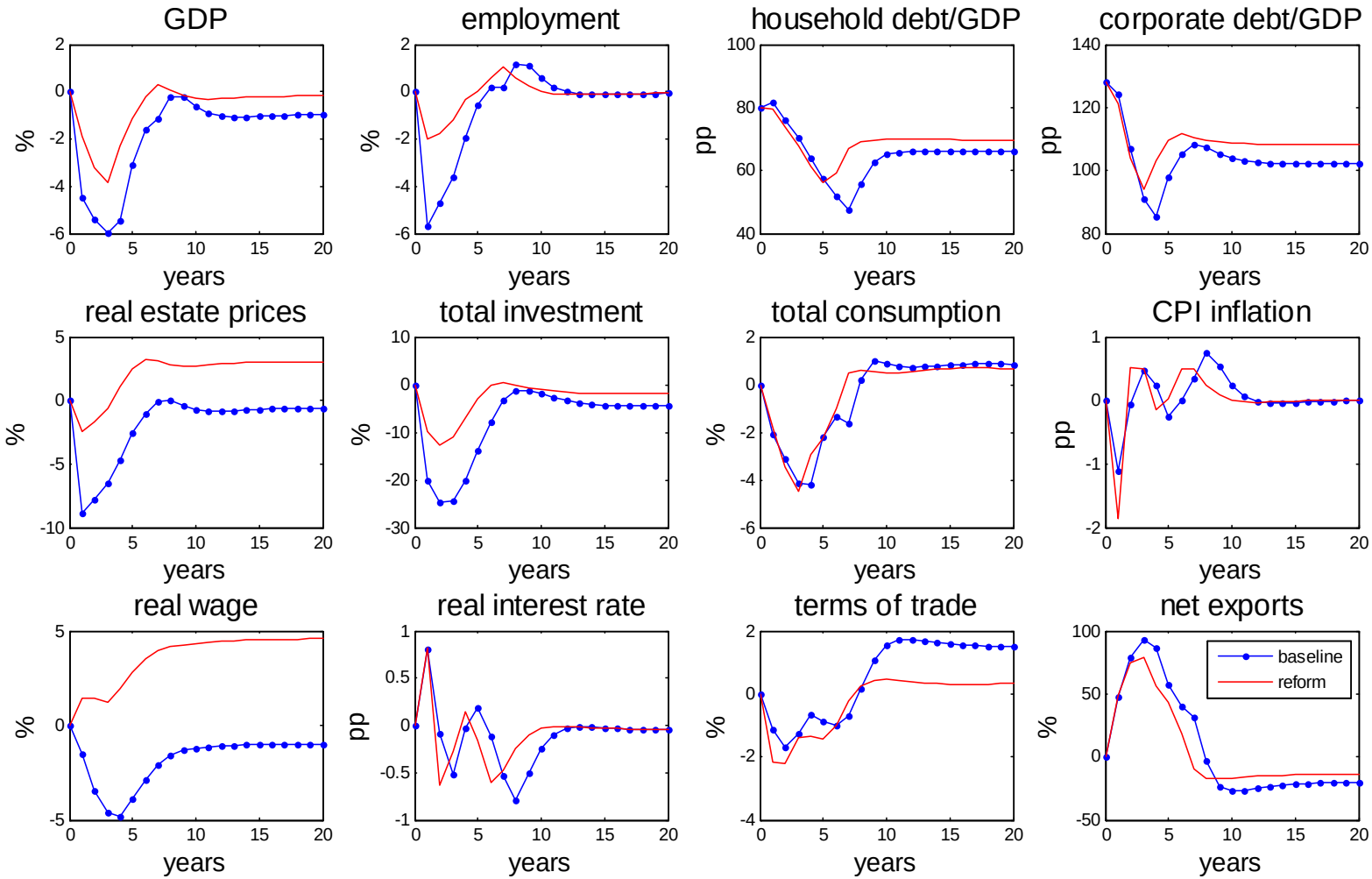
- Investment recovers *before* entrepreneur debt bottoms out, led by accumulation of internal funds (net worth ↑ after impact).



Product market reform

- We simulate a sudden, permanent fall in desired *price markups* (5%)

Product market reform



Product market reform: macro effects

Long run:

- GDP goes up, employment remains stable (real wages and labour share go up)

Short/medium run:

- GDP and employment fall by *less* than in the baseline
- Investment behaves significantly better, anticipating higher future demand.
- Consumption falls slightly below the baseline
- Additional terms of trade depreciation fuels gross exports, though *net* exports worsen due to stronger domestic demand

Product market reform: positive effect on investment

Key question: How is the additional investment financed in the short term?

- On the one hand,
  - Entrepreneurs current unit profits drop as markups fall
  - Deflationary effect of reform raises the real value of debt repayments
- On the other hand,
  - Higher asset prices $\longrightarrow$ entrepreneurs' net worth is *higher* in the reform scenario
  - Entrepreneurs cut down their consumption significantly
  - Total demand goes up, pushing up profits

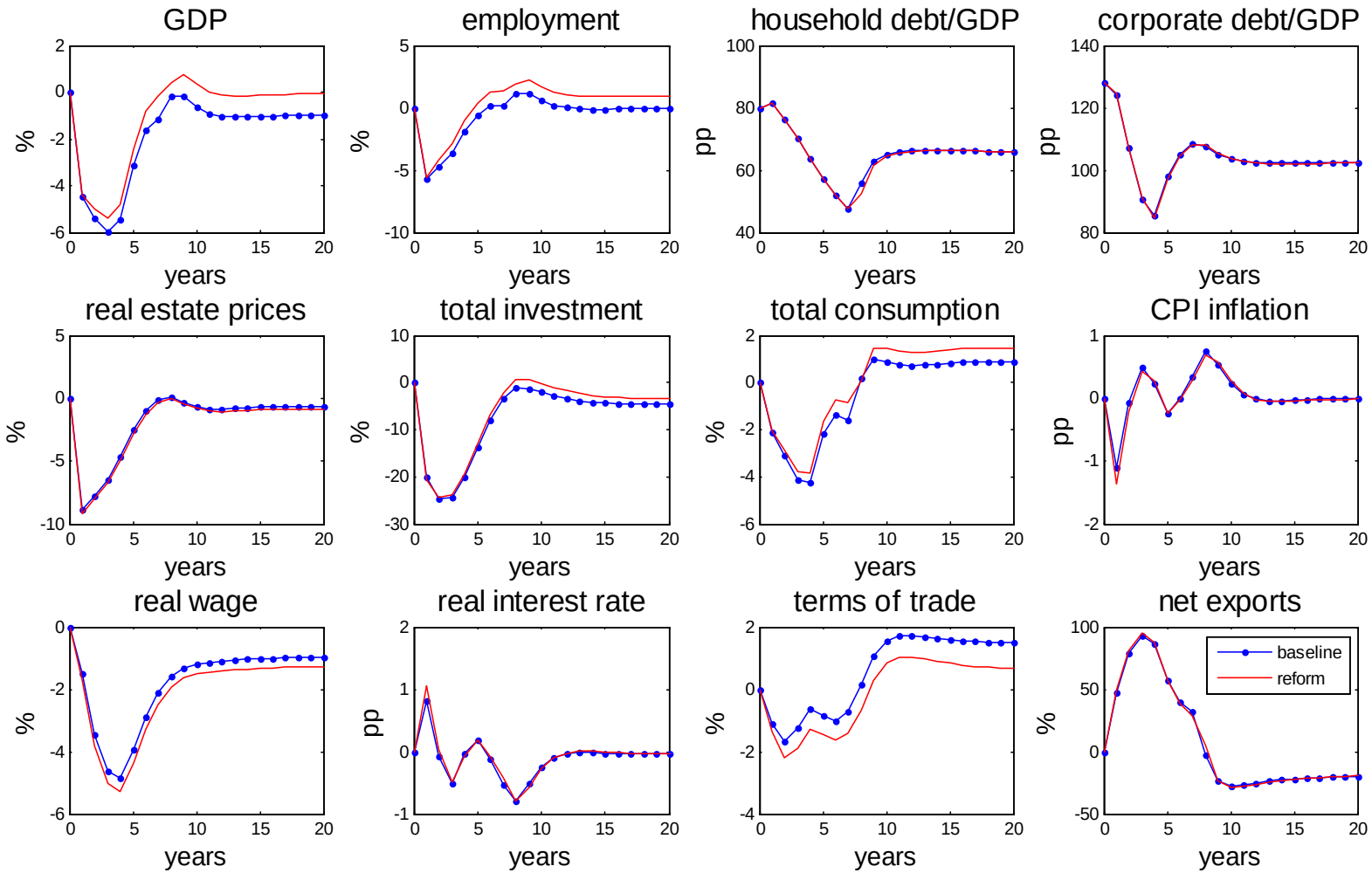
Product market reform: deleveraging ends earlier

- Reform brings *forward* the end of the deleveraging phase: T^* and T^{**} both go down.
- Focus on T^* (entrepreneurs):
  - Higher initial net worth allows for more investment in the short term.
  - Higher investment today implies higher net worth and investment tomorrow, and so on.
  - Faster recovery of net worth leads *ceteris paribus* to an earlier T^*.
  - Anticipation of earlier recovery of credit leads to higher asset prices today, higher net worth and investment, etc.

Labor market reform

- We simulate a sudden, permanent fall in desired *wage markups* (5%).
  - Model proxy for unions' bargaining power.

Labor market reform



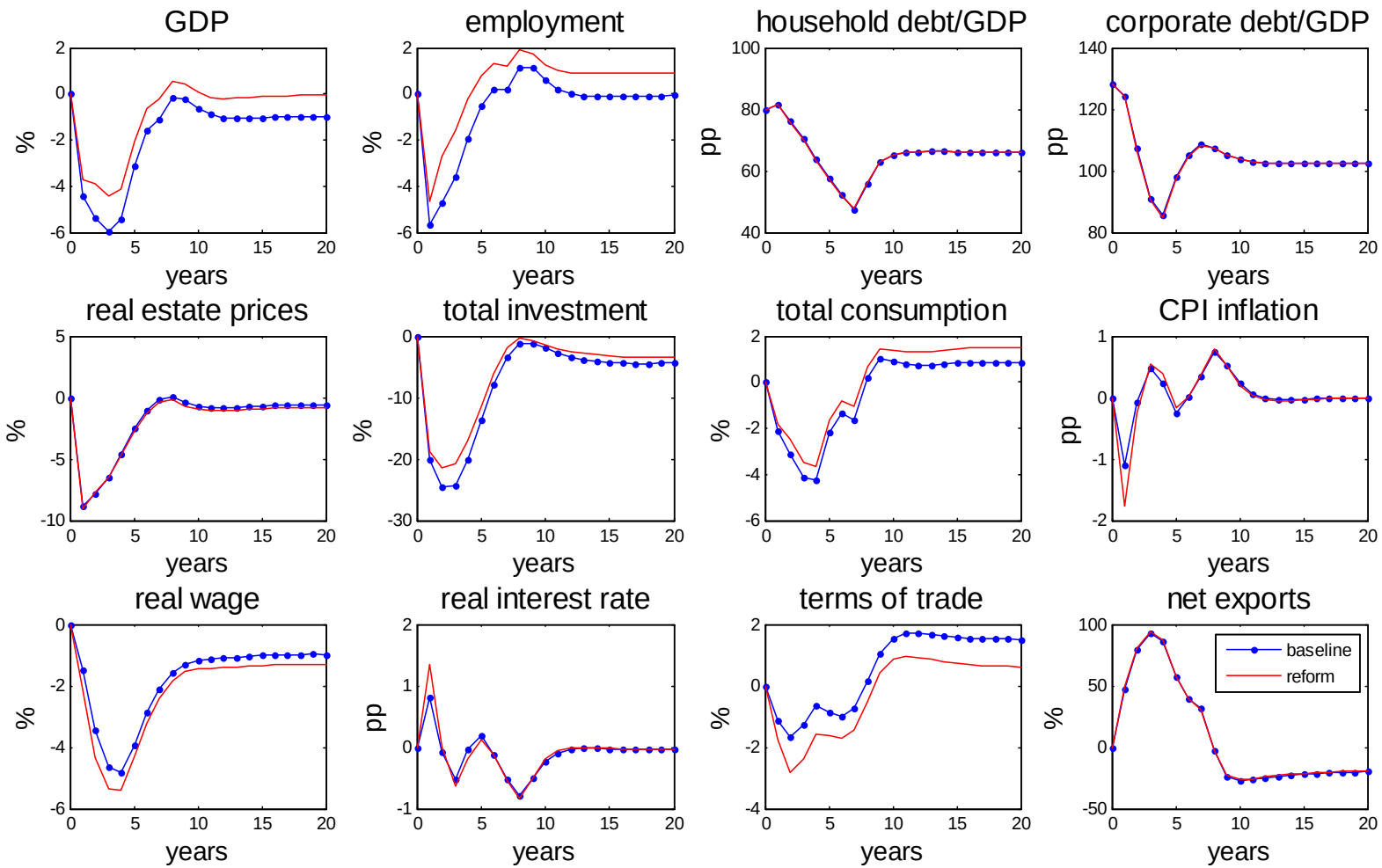
Labor market reform (cont'd)

- Long-run gains in GDP and employment
- Short/medium-run effects:
  - No effect on GDP on impact, then gradual improvement.
  - Similar effect on employment (main variable targeted by such a reform).
- Positive short/medium-run effects smaller than those of product market reform:
  - Investment does not respond positively: entrepreneurs meet higher demand by hiring more (cheaper) labor.
  - Entrepreneur consumption slightly increases.
    $\Rightarrow$ forces that brought T^*'s forward with product market reform are *not* active now.

Broader labor market reform: higher wage flexibility

- Double layer of nominal rigidities (wages + prices) $\Rightarrow$ fall in desired wage markups takes much longer to affect production prices.
- Now, consider a broader labor market reform that includes *faster adjustment* of nominal wages to desired wages.
- Reduce Calvo wage parameter from 0.75 to 2/3 $\Rightarrow$ reduce average wage duration from 4 to 3 quarters.
- Higher wage flexibility improves things significantly in the short run.

Broader labor market reform

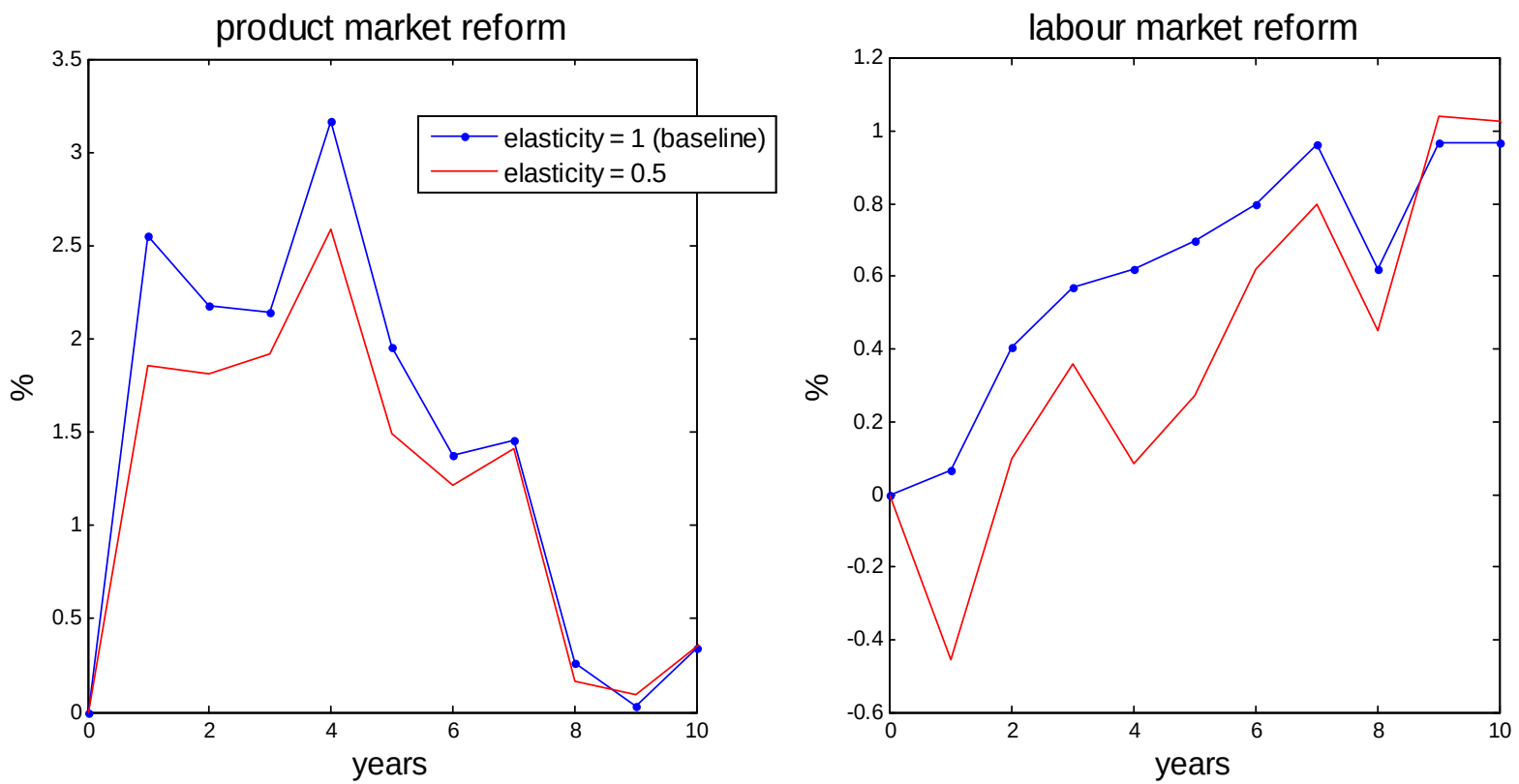


Further analysis

- Two important channels for understanding the positive short-run effects of reforms:
  - The role of the external sector.
  - The role of financial frictions.

The role of the external sector

Responsiveness of net exports to reform-driven depreciation in terms of trade is key



Differential effect of reform on GDP

The role financial frictions

- Long-term debt mitigates the debt-deflation channel (Fisher effect) in the short-run to a large extent:
  - what is relevant for a debtor's budget is the impact of deflation on the flow of debt repayments:

$$\frac{R_{t-1}}{\pi_t} b_{t-1} - b_t = \frac{(R_{t-1} - 1) + (1 - \gamma)}{\pi_t} b_{t-1} = \frac{R_{t-1} - \gamma}{\pi_t} b_{t-1}$$

  - with long-term debt ($\gamma > 0$), the flow can be significantly lower than the stock (e.g. the annual payment of a mortgage is an small fraction of the principal)
- Also, credit constraints render the rise in the real interest rate less contractionary (somewhat ironically....)

Concluding remarks

- Structural reforms may unchain positive effects on GDP and employment already in the short run ...
  - ... even without monetary stimulus (small open economy inside EMU $\approx$ ZLB).
- Long-run debt buffers short-term costs of reforms.
- Responsiveness of net exports to terms of trade depreciation is important to overcome negative deflationary effects of reforms.
- Reforms in *product* market are more investment-friendly, fostering earlier recovery of credit and activity.
- Reforms in *labor* market do not bring forward the end of deleveraging, though they have permanent positive effects on employment (their intended outcome).
- The positive short-term effects of labor market reforms are amplified when nominal rigidities in wages go down.