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Structural reforms and external rebalancing in the euro area: a model-based analysis

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Structural reforms and external rebalancing in the euro area:

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Abstract:

The paper uses a 3-region version (small open economy in EMU, other euro area, rest of the world) of QUEST to assess the impact of structural reforms on external positions along two dimensions, namely the impact of flexibility and prudence on the *prevention* of imbalances and the contribution of structural reforms to their *correction*. With regard to imbalance prevention, the impact of nominal price/wage flexibility above current levels on the reaction of external positions to bubble/demand shocks is modest and case-dependent; prudent collateral valuation mitigates overborrowing risks. Product market reform, wage moderation and fiscal consolidation can support/accelerate the *correction* of imbalances as they increase price competitiveness and improve trade/current account balances in the short and medium term (here, up to 5-6 years). Lasting structural reforms bring permanent trade competitiveness gains. The initial improvement of external balances narrows in the long run, however, because growth-enhancing reforms also raise import demand when income rises in the longer term. EMU-wide reforms affect balances with the rest of the world, but do not reduce disparities between EMU member states.

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1. INTRODUCTION

External imbalances at the global level have been on the agenda of economic research and policy making for many years, with discussions centering on the emergence and sustainability of large external deficits/surpluses, the prospects of smooth/disruptive rebalancing and the implications for deficit and surplus countries.

Similar questions are now raised at the euro area level, where the scale and disparity of current account positions and foreign indebtedness have become major concerns notably since the collapse of the housing bubble and the debt crisis in numerous member countries. The current account of the euro area aggregate is approximately balanced, but the external positions of the member countries scaled by GDP are similarly diverse as imbalances at the global level.

The current account imbalances that have emerged in the euro area over the past decade reflect, broadly speaking, high consumption/low saving rates rather than exceptional investment in the deficit countries (e.g., Blanchard and Giavazzi, 2002; Jaumotte and Sodsriwiboon, 2010). The growing disparity of current account positions has been facilitated by financial market integration and the decline of borrowing costs in the periphery of the euro zone.

Neither the occurrence of large current account deficit/surplus positions nor the dominance of low saving is necessarily problematic. The external deficits/surpluses may rather reflect convergence mechanisms in an increasingly integrated market. The theoretical framework behind such a benign view is capital return equalisation and/or consumption smoothing.

To the extent that marginal returns to capital decrease with capital deepening, return equalisation implies that capital should flow to capital-scarce regions in an integrated financial market, leading to growing (declining) investment and external deficits (surpluses) in countries with low (high) initial capital endowment (e.g., Schmitz and von Hagen, 2009).

The second factor is consumption smoothing, motivated by decreasing marginal returns to period consumption. Unless they face binding borrowing constraints, the households borrow against expected growth in future income and increase consumption already at present, before domestic activity and productivity actually expand. The consumption smoothing implies an initial rise in imports and net foreign indebtedness (e.g., Blanchard and Giavazzi, 2002).

Consumption smoothing may relate not only to expected catch-up growth and income convergence, but also to demographic trends. Ageing populations with projected future shortages of workers and pension contributions should save income and accumulate wealth for consumption spending after retirement. Younger and growing societies, on the other hand, may borrow against future workforce, income and contribution growth.

Blanchard and Giavazzi (2002) and Schmitz and von Hagen (2009) are exemplary studies that interpret the evidence of strengthening financial integration and the increasing elasticity of net capital flows with respect to per-capita income differentials in the euro area as sign of proper functioning financial markets, not as manifestation of unsustainable debt accumulation.

The benign view suggests smooth rebalancing in the longer term. External deficits/surpluses diminish when the economies have grown more equal. Net cross-border investment declines when cross-country return differentials narrow, and consumption is increasingly financed domestically as household incomes rise.

The less benign view is that external imbalances reflect, at least partly, borrowers' and lenders' misperceptions about the prospect of deficit countries, notably an overestimation of future income growth and an underestimation of lending risks. Declining borrowing costs and exuberant growth and return expectations lead to consumption and investment booms such as the housing bubble in the EMU periphery (e.g., European Commission, 2010; Gourinchas, 2002; Jaumotte and Sodsriwiboon, 2010).

Demand expansion and asset bubbles tend to amplify domestic price and wage growth, which translates into real effective appreciation and reduces the competitiveness of domestic tradable products in international markets and at home (e.g., Berger and Nitsch, 2010; Biroli et al., 2010; Blanchard, 2007; Ruscher and Wolff, 2009; Zemanek et al., 2010). Falling trade competitiveness reduces the ability of deficit countries to earn export revenues and to service the accumulated foreign debt.

Although there is no smooth and automatic rebalancing as in the convergence scenario, unsustainable imbalances of the second type eventually have to unwind. The fear and reality is that this adjustment can be sudden and highly disruptive. Borrowing and budget constraints may tighten instantaneously as the risk assessment of lenders shifts and credit dries up. Debtors may no longer be able to borrow in international markets and to service their outstanding debt (e.g., Gourinchas, 2002). What follows is a painful and long episode of depression, adjustment and correction.

Risk neglect, consumption booms and asset bubbles in external-deficit countries also imply costs for surplus economies even before the unwinding of unsustainable debt positions. In times of careless lending, sound investment projects in surplus countries have found it hard to compete with the (faulty) promise of high and save returns abroad. The export of savings has disadvantaged domestic economic activity and employment in the surplus countries (e.g., Sinn, 2010).

The present paper does not address the emergence of euro area imbalances and the relative contribution of benign (convergence) and problematic (unsustainable credit expansion, competitiveness loss) factors. Instead, the paper provides a model-based analysis of the impact of structural reforms on external imbalances in two areas, namely the impact on:

(1) Imbalance *prevention*, namely the impact of price and wage flexibility/stickiness and borrowing constraints on the reaction of external balances to bubble shocks. The simulations test whether/how higher price and wage flexibility and prudent collateral valuationaffect the response of external balances to falling risk premia on house investment (housing bubble) and general domestic demand shocks, starting from the idea that nominal flexibility may amplify price and dampen volume responses to temporary shocks.

(2) Imbalance *correction*, namely the potential of goods/labour market reform and fiscal consolidation to support/accelerate the correction of existing imbalances. This dimension illustrates the impact of product market reform (price mark-up reduction), labour market reform (wage moderation) and fiscal consolidation on external balances in reforming countries. While

the case for structural reforms builds primarily on positive employment, activity and income effects, the simulations test for a double dividend in the case of external adjustment needs.

Empirical studies suggest that regulatory reform can significantly improve the price competitiveness (Biroli et al., 2010; Ruscher and Wolff, 2009) and net trade positions (Berger and Nitsch, 2010; Zemanek et al., 2010) of reforming countries. The present paper contributes an analysis of how structural reforms affect external positions in a general-equilibrium framework. The model specifies the transmission channels (price, wage and credit responses to bubbles; competitiveness and income effects of structural reforms) and illustrates what determines the size and timing of the effects.

The analysis uses a 3-region version of DG ECFIN's QUEST III model that includes a (reforming) small open economy in EMU, the rest of the euro area, and the rest of world. The model has three sectors (tradable, non-tradable, housing), three types of private households (liquidity-constrained, credit-constrained, Ricardian) and numerous nominal and real rigidities (price and wage stickiness; adjustment costs on employment, investment, the capital stock and capacity utilisation; habit persistence).

Contrary to previous analysis of structural reforms in QUEST and other DSGE models (e.g. D'Auria et al. 2009, Roeger et al., 2008), the paper focuses on the impact of structural reforms on external balances in monetary union, not on the growth and employment effects of product, labour and financial market policies. The simulations analyse the impact of unilateral reforms in the reforming EMU member country, but also consider the interaction or spill-over effects from EMU-wide reform implementation and the impact of alternative initial conditions on reform effects.

Section 2 describes the underlying 3-region, 3-sector QUEST III version. Section 3 discusses the reaction of external balances to temporary housing and domestic demand shocks under alternative degrees of price stickiness, wage inertia and collateral constraints. Section 4 shows the impact of product/labour market reform and fiscal consolidation on the external position. Section 5 summarises the results and places them into the context of existing empirical studies.

2. ANALYTICAL FRAMEWORK

The analysis uses the European Commission's QUEST III model. QUEST III is a global macroeconomic model developed for macroeconomic policy analysis and research. A member of the class of New-Keynesian Dynamic Stochastic General Equilibrium (DSGE) models, QUEST has rigorous microeconomic foundations derived from utility and profit optimization and includes frictions in goods, labour and financial markets. With empirically plausible estimation and calibration they are able to fit the main features of the macroeconomic time series. Ratto et al. (2009) provide a detailed exposition and estimation of the core version. Extensions are described in in't Veld et al. (2011), Roeger and in't Veld (2009), and Roeger and in't Veld (2010). Figure 2.1 illustrates the structure of the model.

QUEST distinguishes the following production sectors: tradables and non-tradables, and the latter sector is further disaggregated into construction and other non-tradables. Tradables, con-

struction services and other non-tradables are imperfect substitutes in consumption and investment demand. Output is produced by profit maximising monopolistically competitive firms, using a Cobb Douglas technology with capital, labour and both domestic and imported intermediate inputs.

Figure 2.1: QUEST III country block
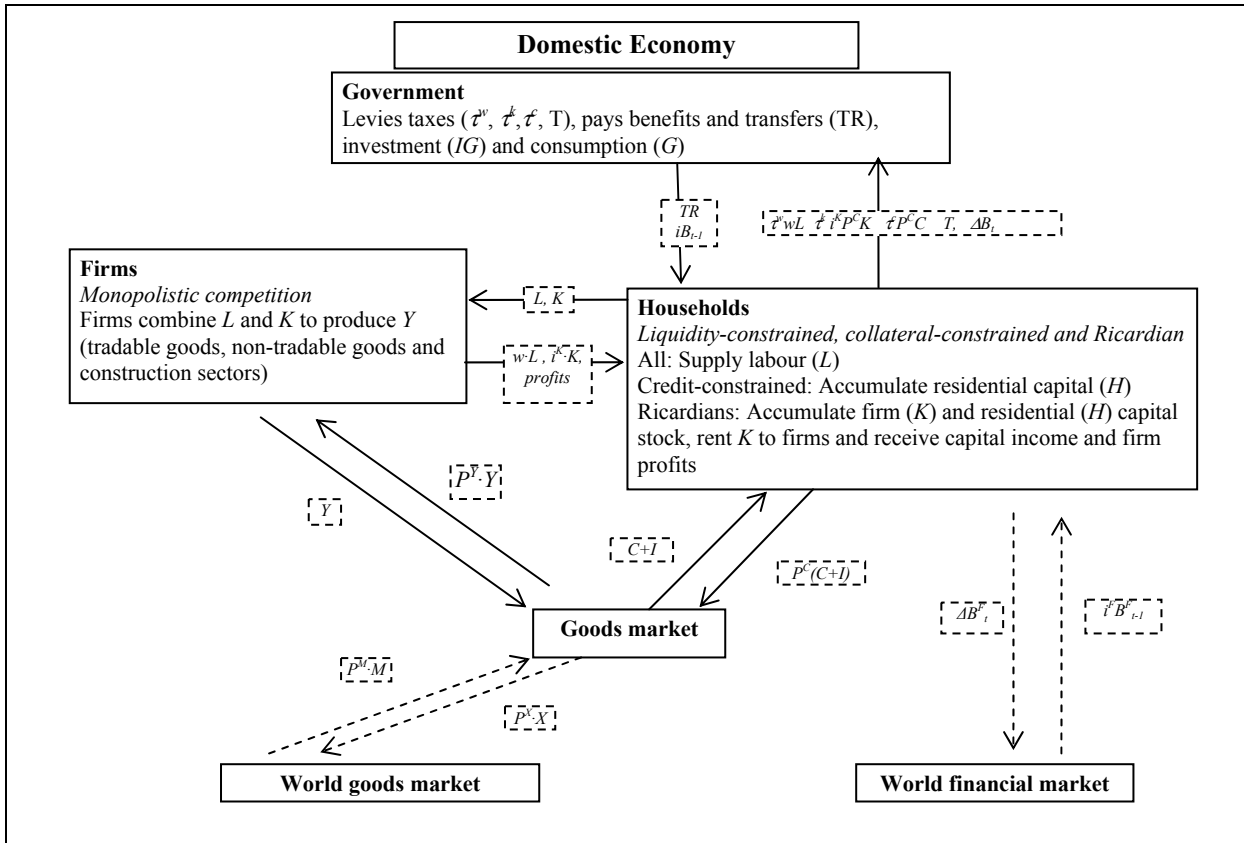
Goods and capital markets are internationally integrated. Tradable goods produced in one region are imperfect substitutes for tradable goods produced in other regions. Capital is perfectly mobile, so that uncovered interest parity (UIP) holds.

Households make savings, consumption, residential investment and labour supply decisions. There are three different types of households: (i) financially unconstrained (Ricardian) households, who can optimise only facing an intertemporal budget constraint, (ii) credit-constrained households that are net debtors and which can only borrow up to collateral constraint with an exogenously fixed loan to value ratio, and (iii) liquidity-constrained households, who do not have access to financial markets, i.e. cannot borrow against future income or save via financial/real investment, and in each period consume their entire disposable labour and transfer income.

There is a trade union which sets wages taking into account preferences of the individual household groups. Goods and labour markets are subject to nominal and real rigidities. The market for mortgage lending is subject to a collateral constraint. There are no financial constraints for corporate borrowing.

The government is subject to an intertemporal budget constraint. On the expenditure side QUEST distinguishes between government consumption, government investment and transfers (further disaggregated into unemployment benefits and other transfers). On the revenue side, the model distinguishes between taxes from consumption, labour and capital. Tax revenues are linked to their corresponding tax bases via linear tax rates. There is a debt rule which forces the adjustment of taxes and expenditure such that a certain defined debt target is reached.

Households, firms and the government make decisions which are consistent with their respective intertemporal budget constraints. This also makes sure that all stock flow relationships are modelled consistently.

The analysis in this paper uses a model version with three regions: a reforming small open EMU country, the rest of the euro area, and the rest of the world. Except for individual EMU countries, the regions have rule-based monetary stabilisation policies. The simulations focus on private-sector adjustment and, with the exception of the expenditure-based fiscal consolidation scenario in subsection 3.3, keep government consumption and investment constant in real terms.

Given the focus on external balances, the modelling of international linkages deserves more detail. Import volumes (M) are a function of domestic demand, i.e. domestic private and government consumption and investment (C, I, G, IG), and the price of imports (P^M) relative to the overall (utility based) consumer price deflator (P^C):

$$M_t = s^M \left(\frac{P_t^C}{P_t^M} \right)^{\sigma^M} \left(C_t + I_t + G_t + IG_t \right)$$

The parameter s^M indicates the steady-state share of imports in domestic demand, and σ^M is the elasticity of substitution between bundles of domestic and foreign tradable.

QUEST assumes similar demand behaviour in the other model regions, so that exports can be treated symmetrically. Real export demand (X) is derived as:

$$X_t = s^{M,W} \left(E_t \frac{P_t^{C,F}}{P_t^X} \right)^{\sigma^X} Y_t^F$$

with E, P^X, $P^{C,F}$ and Y^F being the nominal exchange rate, the export price deflator, the foreign (utility based) consumer price deflator (in foreign currency) and real foreign demand, respectively. Rather than adding an export sector with monopolistic competition and distinct export price setting, export prices are set equal to domestic tradable prices in the simulations.

The country's trade balance and interest income (payments) on outstanding foreign assets (debt) determine the economy's net foreign asset (NFA) position B^F:

$$E_t B_t^F = \left(1 + i_{t-1}^F \right) E_t B_{t-1}^F + P_t^X X_t - P_t^M M_t$$

The current account (CA) as the change in the NFA position in a given period is equal to the period net interest income and net export revenues:

$$CA_t = i_{t-1}^F E_t B_{t-1}^F + P_t^X X_t - P_t^M M_t$$

The determination of the NFA position as the cumulation of current account balances abstracts from valuation effects, i.e. from changes in the value of foreign asset or liabilities due to exchange rate dynamics or movements in asset prices. The omission of valuation effects from exchange rate dynamics is admissible in the present context. Most foreign assets and liabilities of the small EMU member are likely to be denominated in euro, and reforms in the small member economy do not significantly affect the euro exchange rate.

Table 2.1: Model calibration

	Small EMU member	*RoEA*	*RoW*
Nominal Rigidities:			
Average duration between price adjustment (quarters)	4	4	4
Average duration between wage adjustment (quarters)	5	5	5
Average duration between house price adjustment (quarters)	2	2	2
Real Rigidities:			
Labour adjustment cost	13	13	10
Labour supply elasticity	1/5	1/5	1/3
Capital adjustment cost	20	20	20
Investment adjustment cost	75	75	75
Housing stock adjustment cost	40	40	40
Housing investment adjustment cost	40	40	40
Substitution elasticity domestic versus imported goods	1.5	1.5	1.5
Substitution elasticity tradables versus non-tradables	0.5	0.5	0.5
Substitution elasticity between imported goods	0.9	0.9	0.9
Mark-up for tradable goods (%)	9	8	10
Mark-up for non-tradable goods (%)	16	17	18
Mark-up for wages (%)	20	20	20
Capital income tax (%)	28	28	28
Consumption tax (%)	17	17	17
Labour income tax (%)	35	35	35
Consumption:			
Share of liquidity-constrained consumers	0.30	0.30	0.30
Share of credit-constrained consumers	0.30	0.30	0.30
Share of non-constrained consumers	0.40	0.40	0.40
Down-payment rate	0.25	0.25	0.25
Habit persistence	0.70	0.70	0.70
Monetary policy:			
Lagged interest rate	-	0.82	0.82
Consumer price inflation	-	1.50	1.50
Output gap	-	0.05	0.05
National accounts decomposition:			
Consumption	0.61	0.61	0.60
Investment tradables	0.05	0.05	0.06
Investment non-tradables	0.07	0.07	0.07
Investment residential	0.07	0.07	0.06
Government consumption	0.18	0.18	0.18
Government investment	0.04	0.04	0.04
Exports	0.29	0.20	0.06
Imports	0.29	0.20	0.06
Transfers to households	0.16	0.16	0.16
Share in world output	0.03	0.21	0.77

The economic size, trade openness, trade linkages and regional sector sizes (tradables, construction, and other non-tradables) are taken from the GTAP database. The country size and trade openness correspond to values for Spain and closely matches the average country size and trade openness of EMU member countries.

The calibration in Table 2.1 is intended to capture a stylised average EMU member country and therefore uses calibrated and estimated euro area values as detailed in Ratto et al. (2009), Roeger and in't Veld (2009), and Roeger and in't Veld (2010). The model does not attempt to replicate particular economic institutions of individual member countries such as specific goods and labour market characteristica. This notwithstanding, the choosen parameters are largely consistent with estimated and calibrated DSGE models for individual member countries such as Spain (Andrés et al., 2010; Boscá et al., 2010; Burriel et al., 2010).

The same values for nominal and real rigidities (adjustment costs for prices, wages, employment, investment and capital) are used for the entire euro area. Uniform nominal price and wage stickiness parameters harmonise with results from the ECB Inflation Persistence and Wage Dynamics Networks that the average price and wage contract duration is fairly similar across euro area countries (Druant et al., 2009; Knell, 2010).[1]

Similarly, Kolasa (2010) uses uniform nominal and real adjustment costs for the euro area and calibrates long-run trade linkages and demand shares to actual data. If anything, estimates in Andrés et al. (2010) suggest moderately lower price and wage contract duration, but stronger wage indexation in a country like Spain compared to the EMU average.

3. FLEXIBILITY AND THE RESILIENCE OF EXTERNAL POSITIONS

This section looks at a first dimension of structural reforms, namely reforms that reduce adjustment friction in the economy and may thereby accelerate economic adjustment and increase economic resilience. The simulations focus on increased nominal price and wage flexibility and increased prudence in lending behaviour, i.e. lower risk of over-borrowing.

Increasing price and wage flexibility in the economy strengthens the reaction of goods and factor prices and dampens the volatility of demand and output volumes in response to exogenous shocks. This section explores the implication for external balances.

The section describes and explains the adjustment to two different temporary shocks in the small EMU country, namely:

- A housing bubble that distorts domestic demand towards housing investment and softens borrowing constraints for collateral-constrained households as the value of housing collateral increases,

- A temporary exogenous increase in private consumption and investment demand.

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[1] Italian wage contracts, which last 20 month on average compared to 15 months average duration in the euro area aggregate, are the exception.

More precisely, I model the housing bubble as gradual decline of the risk premium on housing investment. The risk premium declines in quarterly steps of 25 basis points, falling to 500 basis points below the initial value after five years. The risk premium stays low for additional five years and gradually returns to the initial value thereafter. The domestic demand shock as second scenario combines exogenous growth of consumption and productive investment demand. Domestic demand rises exogenously by 1 percent relative to the baseline level. The demand shock lasts for two years, after which the domestic demand schedule gradually returns to baseline.

Expansive demand and housing investment shocks have been mayor factors in the build-up of (unsustainable) external imbalances in the periphery of the euro area in recent years (Andrés et al., 2010; Blanchard and Giavazzi, 2002). The calibration of the shock processes in this section is purely illustrative, however. The impact of the two shocks (500 basis-point decline of housing investment risk premium, 1% domestic demand increase) on the current account and foreign debt is much lower than the actual degradation of external balances in countries at the EMU periphery after the introduction of the euro..Housing bubbles and domestic demand expansions generate trade balance and current account deficits. Housing bubbles raise the demand for residential investment and construction activity, partly financed by capital inflows. The positive demand shock also generates temporary gaps between domestic demand and production. Households borrow from abroad and import goods and services to close the gap between domestic demand and supply.

In addition to nominal price and wage stickiness, the QUEST model includes numerous real rigidities that affect the adjustment to shocks, e.g. investment, capital and employment adjustment costs, and consumption habits. Reducing real rigidities should amplify the reaction of investment, employment and output to exogenous shocks. Real frictions reflect, at least partly, technology or preferences, however, and seem therefore less accessible to regulatory reform than nominal adjustment frictions.

Table 3.1: Baseline and alternative scenarios for adjustment frictions

	Baseline	Alternative
Nominal Rigidities:		
Average length of price contracts (quarters)	4	3
Average length of wage contracts (quarters)	5	4
Credit constraints:		
Prudent assessment of the housing collateral value (adjustment of collateral value by GDP-price instead of house-price inflation)	no	yes

The Figures 3.1 and 3.2 illustrate the impact of the housing bubble and positive domestic demand shocks under the alternative structural settings shown in Table 3.1. The baseline series display adjustment given the baseline calibration of Table 2.1, namely an average duration of price (wage) contracts of 4 (5) quarters and housing collateral valued at current house prices. The series label *prices* refers to impulse responses in which the average duration of price contracts in tradable and non-tradable sectors is reduced from 4 to 3 quarters, but all other pa-

rameters remain as in the baseline calibration.[2] The *wages* series show impulse responses for an average duration of wage contracts of 4 instead of 5 quarters; all other parameters correspond to the baseline calibration. The *house* series illustrate the adjustment with cautious valuation of housing collateral, where the evolution of housing collateral values is indexed to the GDP deflator instead of indexation to current house prices (baseline model) in order to reduce the risk of bubble-driven over-borrowing and credit-expansion; all other model parameters correspond to the baseline of Table 2.1. Finally, the *all* series combine the modifications along all three dimensions (price and wage flexibility, prudent collateral valuation) and present their joint impact on impulse responses.

Figures 3.1 and 3.2 show that increasing nominal flexibility as described in Table 3.1, namely reducing the average duration of price and wage contracts by one quarter, and adopting more prudent housing collateral valuation have only modest and case-dependent impact on the adjustment of external variables/balances to housing bubbles and domestic demand shocks.

Interestingly, price and wage flexibility affect the amplitude of shock responses in different directions. More frequent price adjustment reduces the current account and trade balance deterioration compared to the baseline calibration, whereas increasing wage flexibility amplifies the negative response of external balances.

Reducing price stickiness amplifies the price and reduces the volume response to house investment and general demand shocks. Prices rise in response to the shift in the demand schedule and dampen effective demand compared to situations in which prices adjust sluggishly and remain low for longer. The demand-dampening and supply-increasing impact of rising prices limits the increase in import demand and the deterioration of trade and current account balances.

Increasing wage flexibility, on the other hand, dampens domestic supply. The housing and non-housing demand shocks increase domestic demand and the demand for domestic labour. Flexible wages respond more quickly to growing labour demand than sticky ones, leading to stronger wage and lower employment growth. The wage inflation increases production costs and domestic goods prices, so that the competitiveness of domestic tradables deteriorates. Domestic demand shifts increasingly towards imported tradable goods, import demand raises and trade and current account balances decline more strongly than in the baseline setting with higher nominal wage stickiness.

The prudent assessment of the value of housing collateral dampens the expansion of borrowing and housing investment and the deterioration of external balances in response to the house-price bubble in Figure 3.1 by up to ⅓rd. The credit-constrained households reduce the investment in residential property compared to housing bubbles in the standard setting, which dampens the domestic debt and demand expansion and import demand growth. Limited demand expansion also reduces the real effective appreciation and the deterioration of price competitiveness, so that export volumes decline less than in the standard setting.

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[2] Simulations for separarate reductions in tradable/non-tradable price stickiness have also been tested. The results are very similar to the joint reduction of price stickiness and therefore not reproduced here.

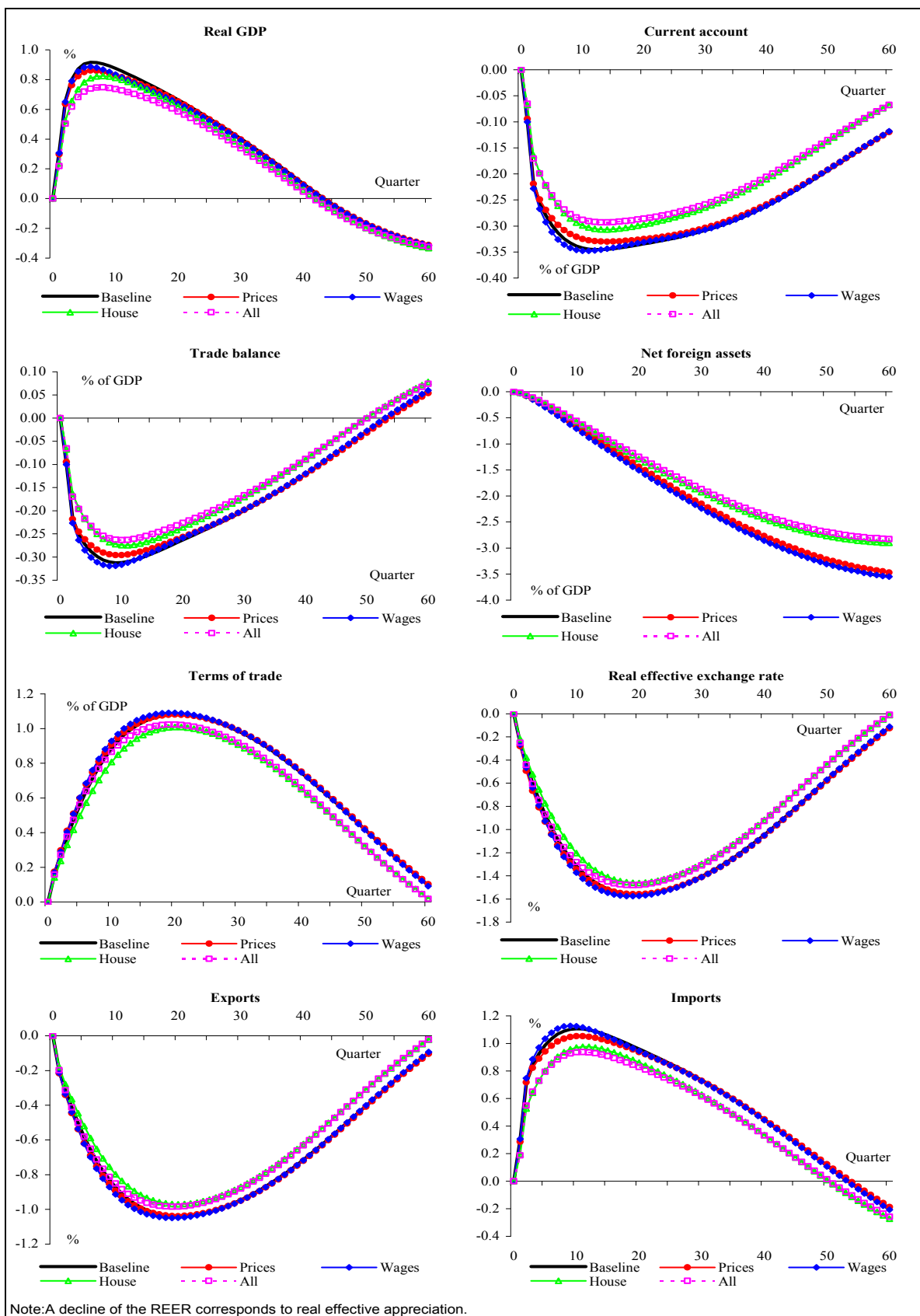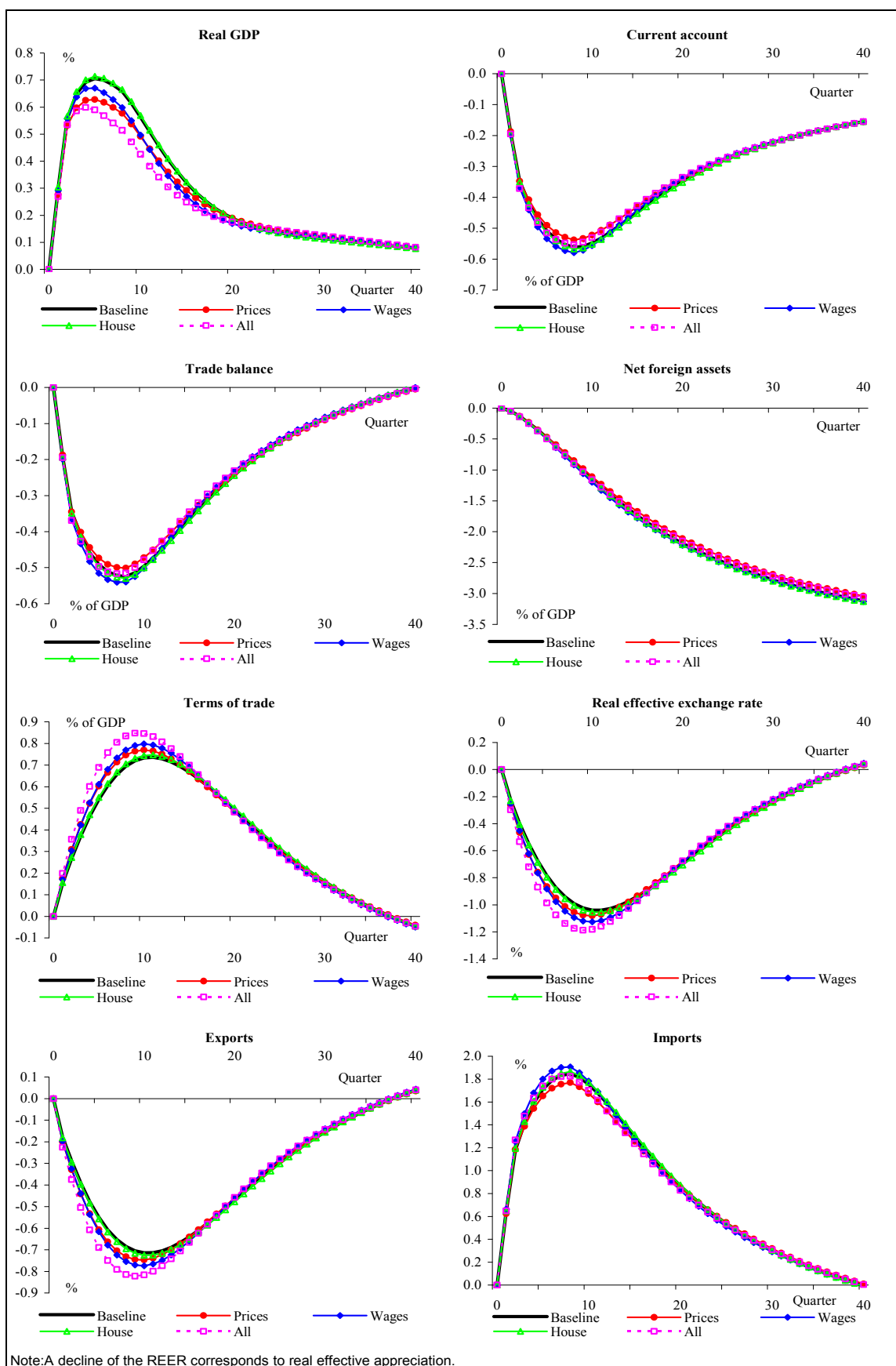**Figure 3.1: Impulse responses for 500 basis-point housing bubble**

Note: A decline of the REER corresponds to real effective appreciation.

Figure 3.2: Impulse responses for 1 percent domestic demand shock

Note: A decline of the REER corresponds to real effective appreciation.

The limited impact of higher nominal price/wage flexibility in Figures 3.1 and 3.2 does not mean that nominal rigidities have generally little impact on the adjustment to shocks. The importance of nominal rigidities should increases in the degree of stickiness. High nominal price and wage persistence together, e.g., imply high real wage rigidity, which prolongs the adjustment to shocks and increases volatility in volumes instead of adjustment in relative prices. However, the results suggest that reducing price and wage rigidity moderately below *current* levels has only limited impact on the amplitude and persistence of the adjustment.

The joint impact of structural change in all three dimensions (price and wage flexibility, prudent valuation of housing collateral) is mixed. It dampens the reaction of real GDP to housing bubble and general domestic demand shocks, i.e. the fluctuation in economic activity. Encompassing reforms also limit the deterioration of the external balances associated with housing bubbles, a result that is mainly driven by the dampening impact of prudent lending policies. The impact of joint reforms on the reaction of external balances to general demand shocks, on the other hand, lies in between the performance of higher price flexibility and more flexible wages. Price flexibility accelerates price adjustment and reduces the adjustment of volumes in response to the demand shift. Wage flexibility, on the other hand, strengthens wage claims in response to increasing labour demand and inflation, which increases production costs, dampens labour demand and strengthens expenditure switching from domestic to foreign tradable goods. Prudent collateral valuation does not affect the adjustment in Figure 3.2 compared to the baseline calibration as the demand shock has little impact on relative house prices.

The results on the short-term adjustment of external accounts to shocks have no simple normative interpretation. Blanchard (2007a) argues that frictions like price/wage rigidity and financial constraints may imply too little rather than too much volatility in current accounts compared to the frictionless benchmark. In a first-best world, eliminating rigidities would then be optimal even if the (short-run) disparity of external positions increased. Removing frictions that reduce the reaction of external balances to exogenous shocks may not be optimal in a second-best world, however, that is characterised by additional distortions.

4. REFORMS AND THE CORRRECTION OF EXTERNAL IMBALANCES

The previous section has analysed the impact of structural reforms increasing price/wage flexibility and reducing the risk of overborrowing on the short-term adjustment of macroeconomic variables, notably external accounts, to temporary housing bubble and non-housing demand shocks.

This section looks at structural reform that shift the steady-state levels of macroeconomic variables such as employment, activity and relative prices in the reforming country. Particularly, it discusses the impact of competitiveness-enhancing reforms on external balances in the shorter, medium and longer term and whether competitiveness-enhancing reforms contributie to (lasting) external rebalancing of economies with external deficits and foreign indebtedness.

Table 4.1 lists the basic reform scenarios. The discussion is limited to a small number of scenarios from the large set of potential reforms, namely to permanent price mark-up cuts, wage moderation and fiscal consolidation.

Table 4.1: Structural reform scenarios

	Reduction
Product market:	
Reduction of producer price mark-up (tradable and non-tradable sectors)	1 percentage point
Labour market:	
Real wage moderation	1%
Fiscal consolidation:	
Reducing the debt-to-GDP ratio… … through lower government purchases … through higher labour taxation	5% of GDP 5% of GDP

The section analyses how structural reforms that raise equilibrium levels of output, employment, consumption and investment and improve the competitiveness of domestic tradable goods affect external balances of countries in monetary union.[3] The reforms are assumed to be credible, i.e. they change long-term expectations of private households and firms upon implementation. The simulations focus on the private sector adjustment and, except for expenditure-based fiscal consolidation, keep government consumption and investment constant in real terms.

4.1 Product market reform

Product market reform that reinforces competition in goods markets by, e.g. facilitating market entry and exit, reduces the price-setting power of firms and the price mark-up that firms can charge. The impact on trade and current account balances depends on various factors and their relative strength. Price reduction improves the price competitiveness of domestic tradable goods in foreign and domestic markets, which increases export and reduces import demand (positive competitiveness effect). But lower mark-ups should also increase domestic activity and incomes in the longer term, which raises import demand when (as in the model calibration in Table 2.1) domestic and foreign tradables are imperfect substitutes (positive income effect).

Figure 4.1 illustrates the impact of 1 percentage-point price mark-up reductions in the tradable (T) and non-tradable (NT) sectors in the small average EMU member economy. The mark-up cut initially lowers domestic demand, due to declining expected profits, the temporary rise in real interest rates and the associated lower demand from Ricardian and credit-constrained households. It improves the trade and the current account; export volumes increase and import volumes decline as domestic tradables become cheaper (competitiveness/substitution effect).

The trade balance and current account improvement narrows in the medium term, and both balances become slightly negative after 4 years as import volumes recover with rising domestic activity, employment and income (income effect). Domestic investment exceeds domestic

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[3] Actual reforms may affect the steady state and the speed of adjustment at the same time. E.g., measures that reduce firms' market power and increase goods market competition are likely to increase price flexibility as well, because demand becomes more price-elastic and non-adjustment more costly in terms of loosing market share. The focus of this section is beyond the few-quarter horizon, however. In addition, section 3 has shown that (moderately) reducing current levels of price and wage rigidity has only modest effects on the short-term adjustment to shocks.

saving, and net capital imports close the saving gap. Although the competitiveness improvement (REER depreciation) from the reform is permanent, the competitiveness and income effects of mark-up cuts (approximetely) offset each other in their impact on the current account and trade balance in the long run.

Figure 4.1: 1 percentage-point steady-state price mark-up reduction in the total economy
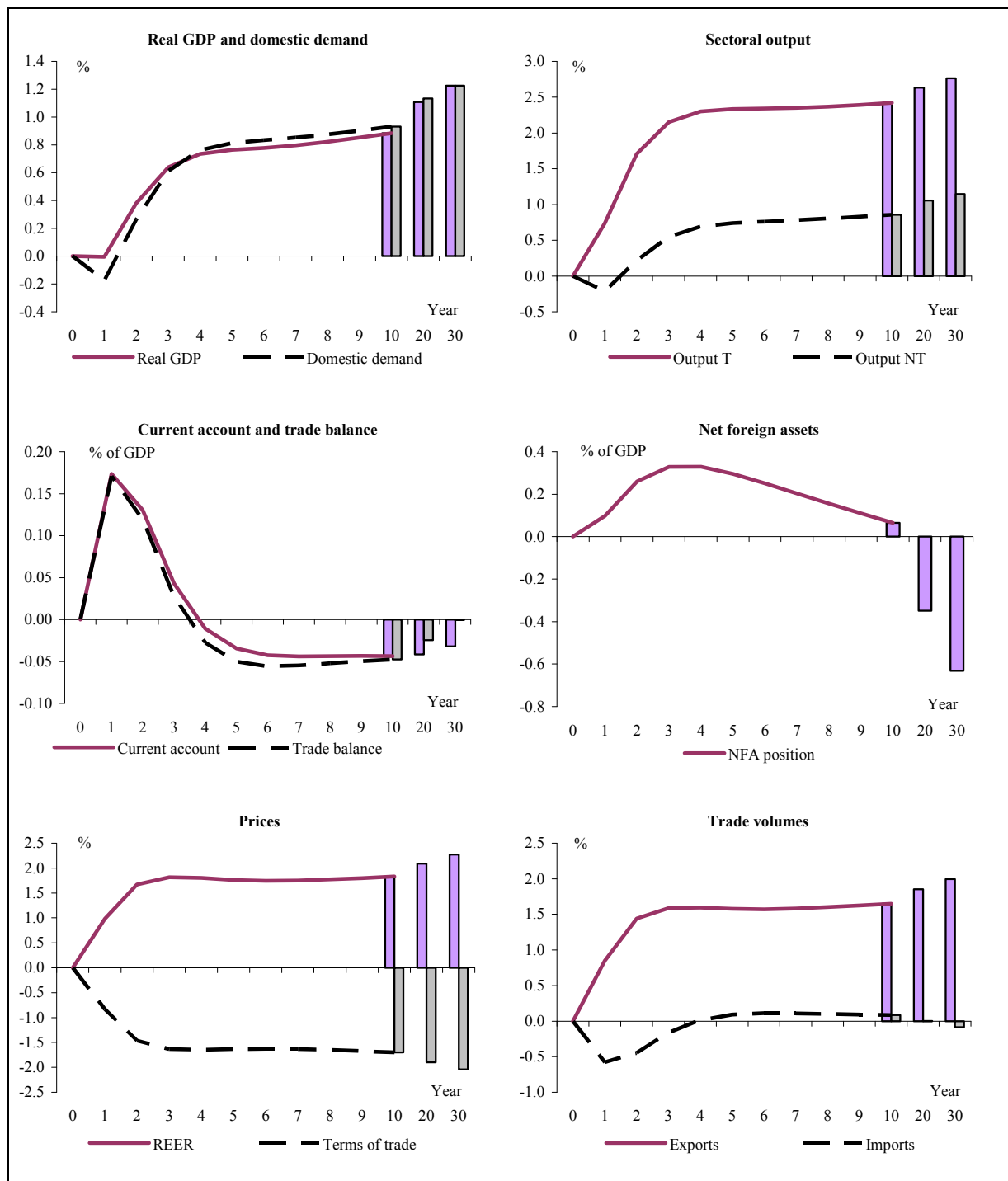
The competitiveness effect of reforms materialises quickly, because nominal prices and wages are sufficiently flexible with average contract durations of only few quarters. The income ef-

fect, on the other hand, takes several years to materialise fully. Real adjustment frictions, such as investment, capital stock and labour adjustment costs, delay the response of economic activity to reforms, so that output and income increase only gradually. Constrained consumers cannot (freely) borrow against future income gains, so that activity and wage incomes have to increase before their consumption and housing investment demand increase as well. The quantitative importance of liquidity-constrained and collateral-constrained households delays the aggregate domestic and import demand response to product market reform.

In addition, price mark-up reduction temporarily increases real interest rates. The real interest rate effect is particular to adjustment dynamics in monetary union (e.g., Blanchard, 2007). The exogenous nominal interest rate together with the expected fall in the domestic price level increases real interest rates and temporarily reduces the consumption and investment demand from intertemporal optimising households, leading to a transitory initial reduction in domestic demand. The price mark-up compression reduces the profits of domestic firms and reduces Ricardian consumption demand relative to the other households.

The initial current account improvement associated with the 1 percentage-point price mark-up reduction remains modest. The current account improvement peaks at 0.17 percent of GDP. At the same time, the 1 percentage-point mark-up reduction seems to reflect rather modest product market reform. Estimates by Badinger (2007) suggest that manufacturing price mark-ups in EU member states have, on average, fallen by around 10 percentage points after the introduction of the internal market program. Price mark-ups in construction have even declined by 20 percentage points during the same period, whereas service sector mark-ups appear to have increased by 7 percentage points. An aggregate current account correction of 2% of GDP may well be crucial in the assessment of external debt sustainability.

Figure 4.2 shows that limitation of the mark-up reduction to tradable goods leaves the interaction of competitiveness and income effects intact. The 1 percentage-point mark-up reduction has less impact on external balances compared to the economy-wide mark-up decline in Figure 4.1, because the shock is concentrated in the tradable sector and smaller in total-economy terms, which weakens the substitution effect in favour of domestic goods (less demand switching from tradable to non-tradable goods) and the demand-dampening real interest rate increase (smaller expected price-level decline).[4]

Analogously to the qualitatively similar responses to general and tradable price mark-up reduction, 1 percentage-point non-tradable mark-up reduction (Figure 4.3) also has similar effects on trade and current account balances. Domestic households substitute non-tradable for tradable goods as non-tradable goods become relatively cheaper. The substitution effect reduces the demand for tradable goods and imports and improves external balances. Trade competitiveness is affected only indirectly via lower production costs (cheaper non-tradable inputs, less wage inflation pressure). The terms-of-trade decline is less pronounced and export volumes increase only ¼ of the volume increase under falling tradable price mark-ups.
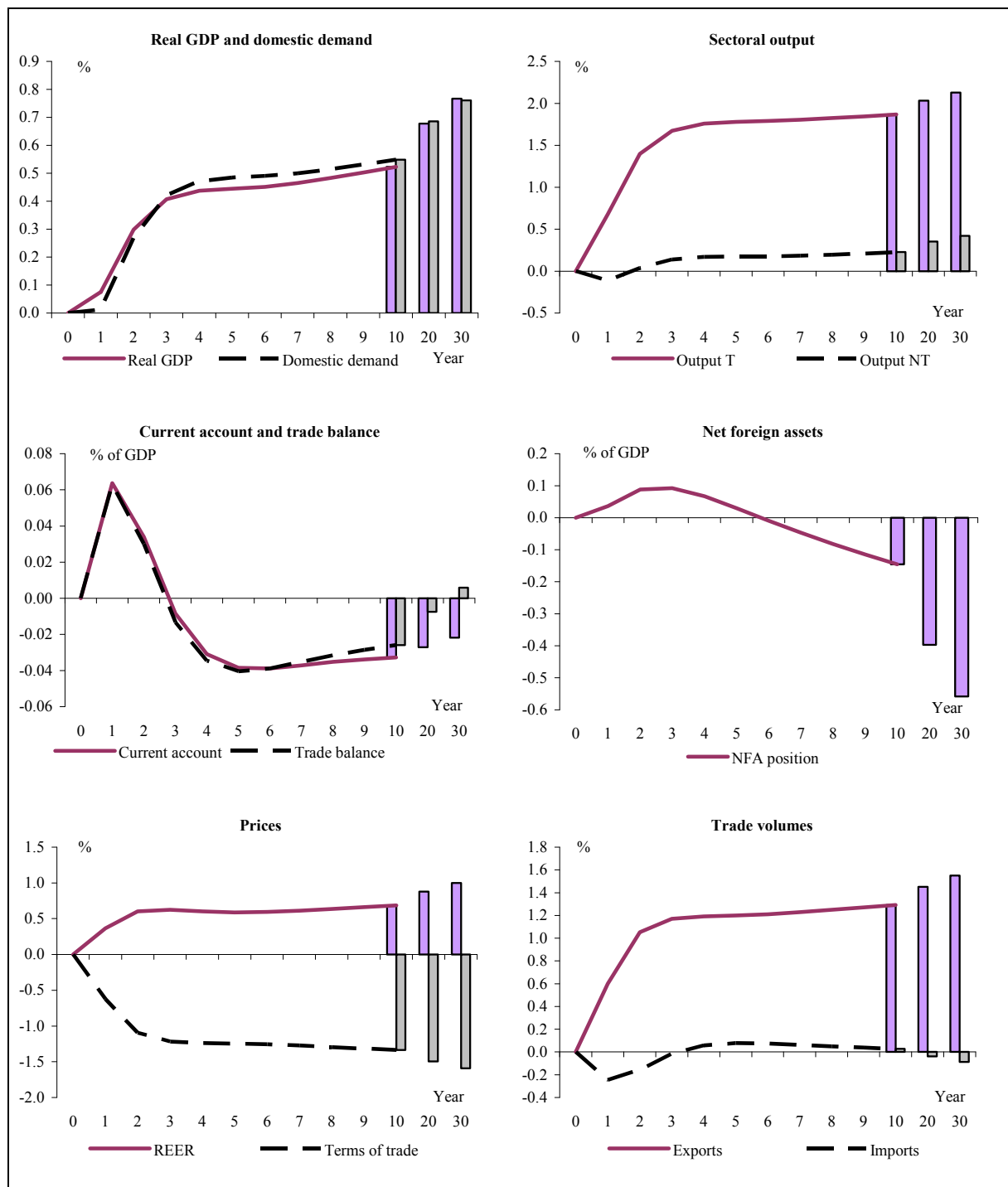
Taken together, price mark-up reduction in the tradable sector boosts net export volumes more than price mark-up reduction for non-tradable goods. Lower tradable mark-ups lead to

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[4] The differences between the real effective exchange rate (REER) and the terms-of-trade responses result from the fact that the REER includes tradable and non-tradable goods prices, whereas the terms of trade compare export to import prices. An increase in the REER signifies real effective *depreciation*; increases in the terms of trade describe increases of export relative to import prices.

stronger terms-of-trade reduction, which also reduces the positive impact of volume responses on net trade values and the current account, however. The simulations illustrate that structural reforms lead to a permanent improvement in trade competitiveness (fall in terms of trade, REER depreciation). Given the countervailing import-increasing income effect in the medium and long term, the lasting competitiveness gain does not translate into a permanent shift in the current account position, however.

Figure 4.2: 1 percentage-point steady-state price mark-up reduction in the tradable sector

Figure 4.3: 1 percentage-point steady-state price mark-up reduction in the non-tradable sector
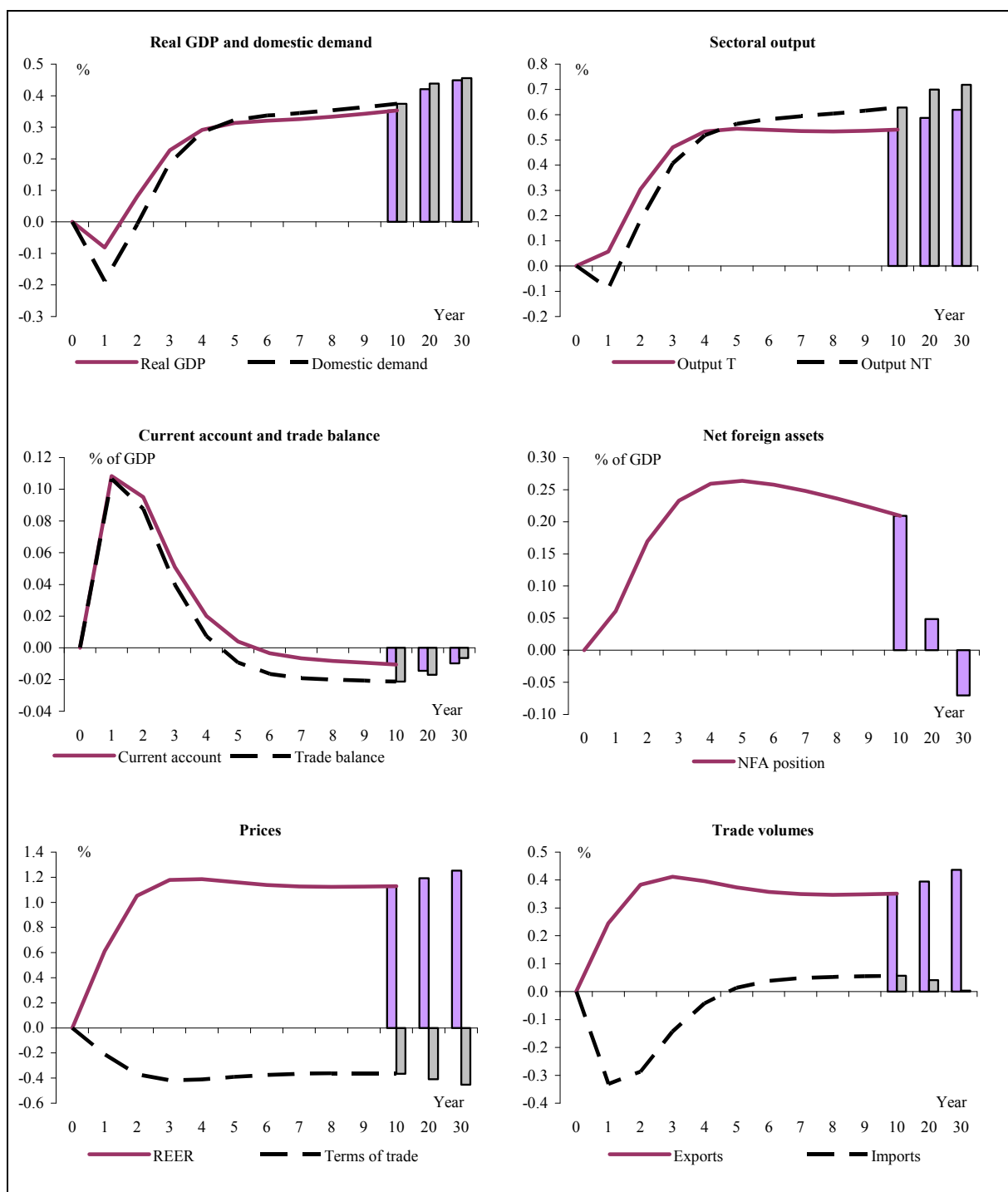
The similar responses for tradable and non-tradable mark-up cuts in Figures 4.2 and 4.3 contrast the results of Everaert and Schule (2008) that suggest qualitatively different trade-balance and NFA effects. As in Figure 4.3, Everaert and Schule (2008) find lower non-tradable mark-ups to lead to REER depreciation and temporary trade-balance improvements, but lower tradable prices are surprisingly accompanied by REER appreciation and an initial deterioration in the trade balance.

The results in Figure 4.3 contradict the idea that reforms lowering service sector mark-ups would reduce the trade surplus of net exporters by strengthening domestic and import demand. Instead, lower relative non-tradable goods prices trigger an initial increase in the real interest rate (given the exogenous nominal rate and expected price level reduction), leading to temporarily declining domestic demand, and relocation of domestic demand from tradable to non-tradable goods, which reduces import demand, before long-term income effects materialise and raise demand for domestic products and imports alike. Evidence for the positive impact of falling non-tradable prices on the trade balance is reported, e.g., in Obstfeld and Rogoff (2005) and Ruscher and Wolff (2009).

4.2 Wage moderation

To the extent that lower wages and production costs translate into decreasing prices (instead of higher profits), wage cuts are regularly proposed as one measure to restore competitiveness in EMU member countries with high initial unit labour costs and trade deficits (e.g., Blanchard, 2007).[5] Symmetrically, stronger wage growth is occassionally suggested to reduce the price competitiveness and net export performance of economies with large external surpluses.

This subsection displays the general-equilibrium effect of real wage moderation on the reforming economy's external position. The wage moderation is modelled as permanent shift in labour supply that reduces real wages by 1 percent on impact and raises the level of employment, provided labour demand is sufficiently elastic. Practically, wage moderation can result from household preference shifts, wage mark-up reduction or falling reservation wages. Labour input is treated as homogenous factor, so that the wage reduction applies to workers in the entire economy.

Real wage moderation reduces domestic production costs and domestic tradable and non-tradable goods prices. The competitiveness gain lowers import and raises export volumes (Figure 4.4). The trade and current account balances improve relative to baseline for a period of 6-8 years, with a peak of 0.30% of GDP in year 2. The initial fall of import volumes results from the expenditure switching towards domestic goods.

The wage moderation also increases employment, domestic activity and income levels in the longer term. The rising net incomes translate into growing domestic and import demand. The income effect weakens the current account improvement and counterbalances the competitiveness-driven external balance improvement in the long run. The reversal of the current account effect also reduces the NFA position after its first-decade peak.

Structural reforms which increase labour supply, employment, activity and domestic demand affect the government budget. Such reforms raise the tax revenue and reduce transfers to unemployed households. The scenario in Figure 4.4 assumes that the government uses the growing revenue to reduce distortionary labour taxation. Reducing the tax wedge between labour costs and net wages adds to the positive impact on employment and activity. Given the reinforcement of the positive supply-side effect, the real GDP impact of wage moderation in Figure 4.4 is an upper-bound estimate. Excluding second-round effects from wage tax reductions dampens the reduction of production cost and the employment and activity growth.

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[5] The conditionality of the competitiveness effect may suggest a joint implementation of product and labour market reforms to contain or avoid the possible increase in profit margins.

On the external side, smaller competitiveness and income gains from wage moderation reduce the initial current account improvement and the countervailing long-run income effect alike.

**Figure 4.4: Real wage reduction of 1 percent on impact**
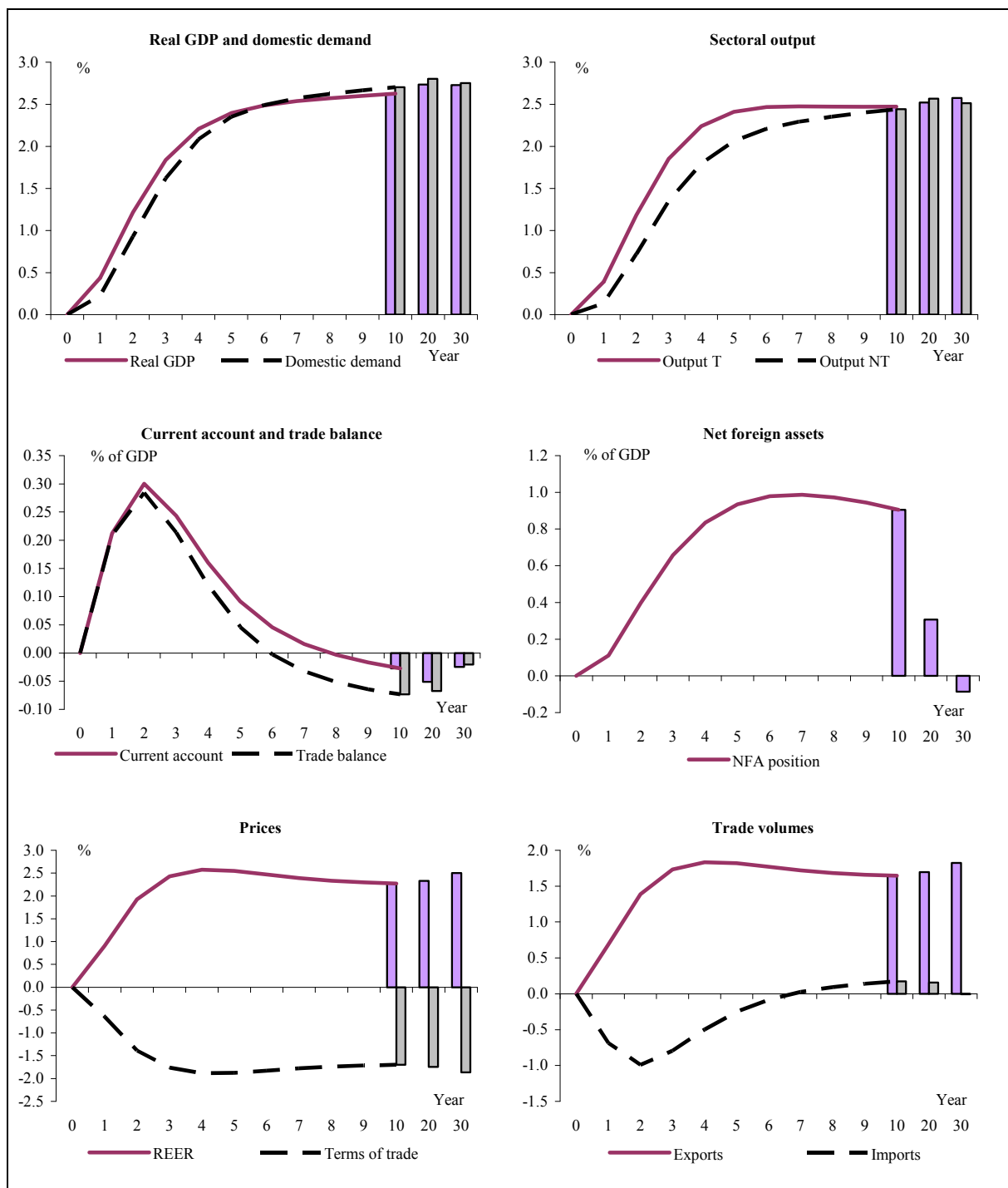
In sum, wage moderation leads to a permanent improvement of price competitiveness. It improves external balances and NFA positions in the short and medium term, but does not lead to a permanent shift in the external position due to the positive income effect. Both wage mod-

eration and price mark-up reduction have qualitatively similar effects on trade and current account positions in the short, medium and long term.

4.3 Fiscal consolidation

Fiscal consolidation is the third selected area of structural reforms. Reducing government deficits and the level of public debt is currently a mayor challenge for EU countries, especially for those countries that have been hit hardest by the economic and debt crisis. Budgetary consolidation can follow expenditure-based or revenue-based approaches, reducing the debt-to-GDP ratio by lower government expenditure, higher government revenues, or a mix of expenditure and revenue components.[6]

Figure 4.5: 5 percentage-point expenditure-based reduction of public debt to GDP

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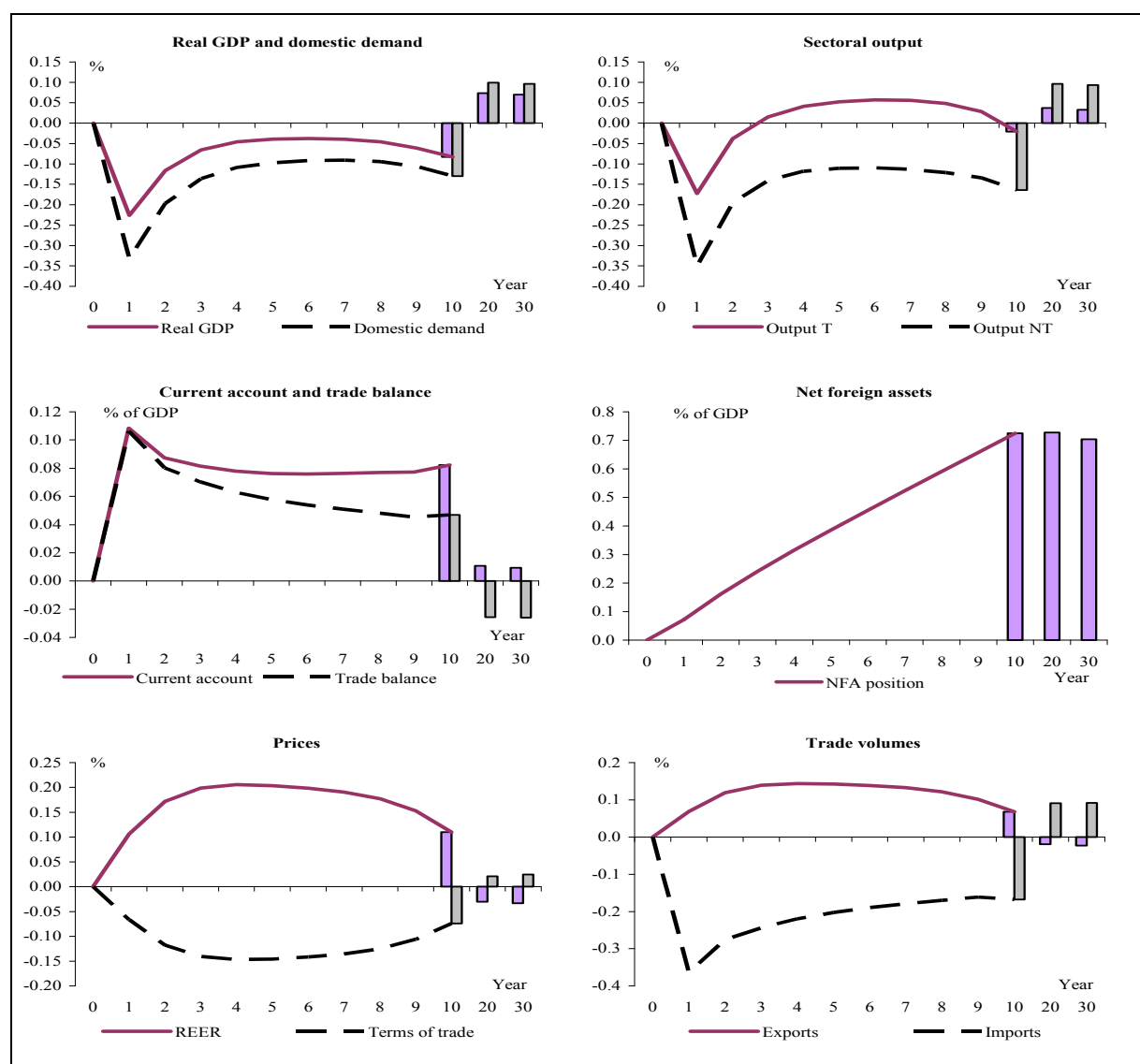
[6] The two scenarios in this section are just examples of expenditure-based and revenue-based fiscal consolidation strategies to illustrate the general pattern in their impact on external balances. For comprehensive analysis of fiscal consolidation and alternative consolidation strategies in QUEST see Roeger and in't Veld (2010).

Figure 4.6: 5 percentage-point revenue-based reduction of public debt to GDP
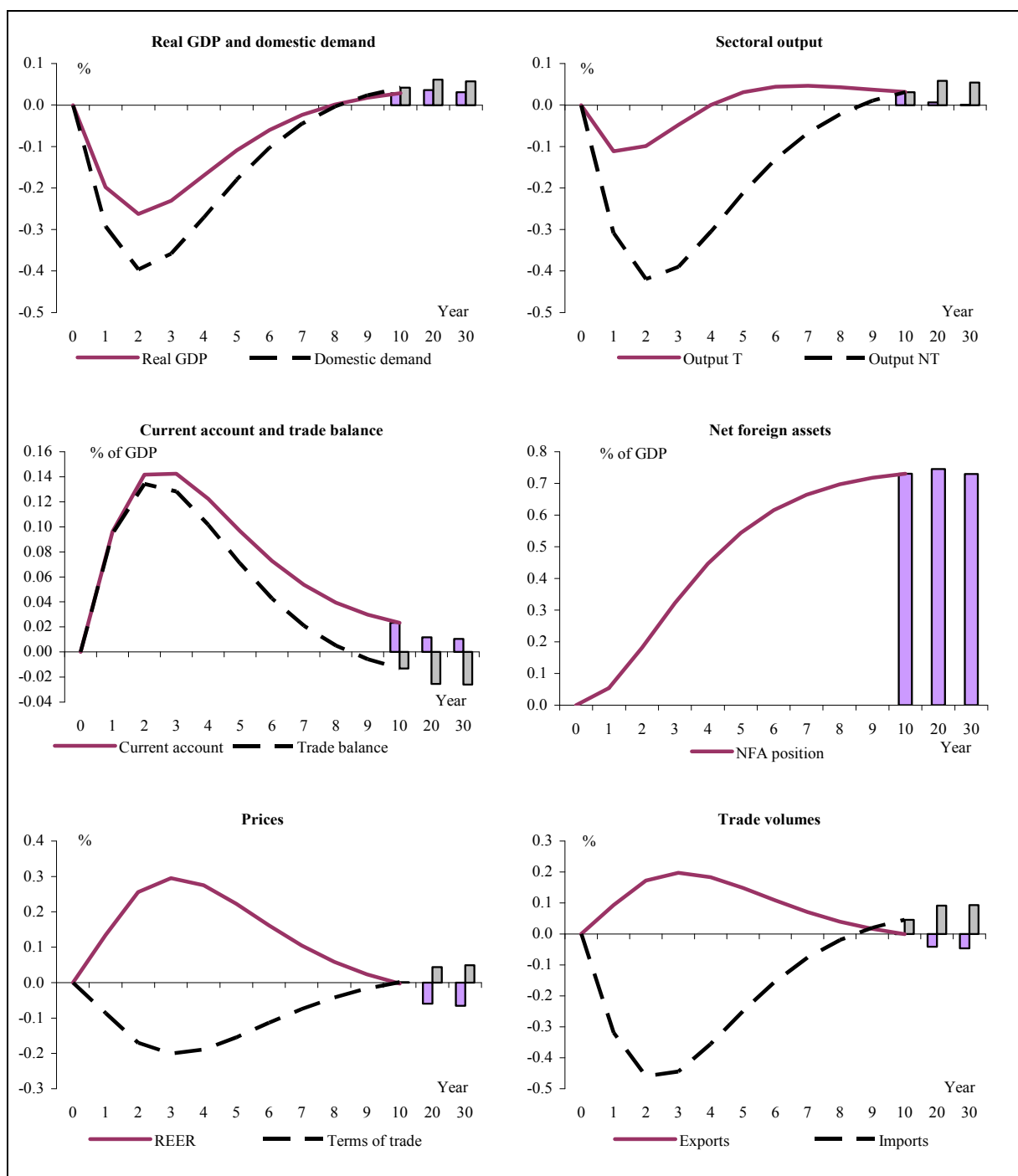
The Figures 4.5 and 4.6 show results for fiscal consolidations reducing the government debt-to-GDP ratio by 5 percentage points. Figure 4.5 portrays the impact of expenditure-based consolidation in the form of lower government consumption. Figure 4.6 shows the effects for revenue-based consolidation, where labour income tax rates are raised to increase tax revenues. The fiscal consolidation is gradual in both scenarios. The government debt-to-GDP ratio reaches its new target level after 10 years.

Figure 4.5 shows that expenditure-based consolidation brings improvements in the trade and current account balances in the short and medium term and long-lasting improvements in the NFA position. Lower government consumption reduces domestic demand and translates into lower tradable, non-tradable and import demand. At the same time, declining domestic activity puts downward pressure on wages and prices and improves the price competitiveness of domestic tradable goods. The terms of trade decline and export volumes increase, so that the demand for domestic tradables weakens less than the demand for domestic non-tradable goods.

Public debt reduction lowers the government's interest burden and increases fiscal space in the longer term. The simulation assumes the government to use the fiscal space to reduce the tax burden on labour income once the new debt target has been reached. Labour tax reduction raises net wages and stimulates domestic activity and private-sector demand. After the demand compression from fiscal tightening, domestic prices recover, exports volumes fall and import demand increases in the longer term, which does however also reduce the positive impact of fiscal consolidation on external balances. Revenue-based consolidation has qualitatively similar effects on external balances (Figure 4.6). Higher labour taxation reduces the disposable income of workers and private demand. Domestic activity and prices decline, import demand falls, exports increase and external balances improve in the short and medium term.

4.4 EMU-wide reforms and member state balances

The scenarios in the previous subsections have all considered unilateral reforms, i.e. reforms in one small member country of the euro area alone. In the context of area-wide fiscal consolidation needs and reform programs such as Europe 2020, however, structural reforms in several member countries at the same time seem to be a plausible scenario.

How do synchronised reforms in the euro area affect the impact of structural reforms on member-state trade and current account balances? Do area-wide reforms reduce or offset the impact on competitiveness and external balances? This subsection compares unilateral and area-wide reforms to provide an answer to this question.
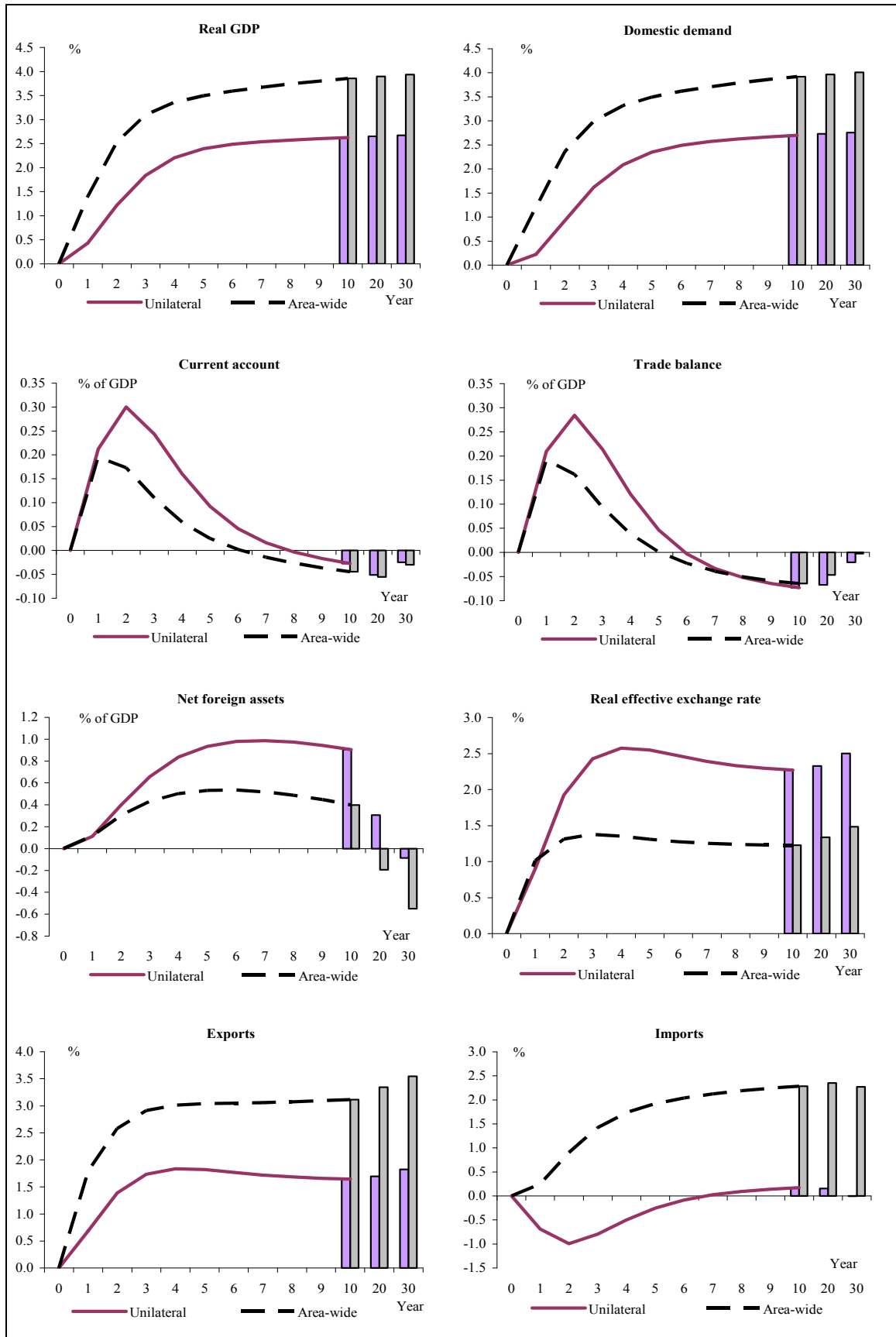
The Figures 4.7-4.9 illustrate that EMU-wide implementation of product market reform, wage moderation and fiscal consolidation dampens the positive short-term and medium-term impact on external balances in individual member states compared to unilateral reform implementation, but does not fully offset the positive effects.

EMU-wide price mark-up reduction, wage moderation and fiscal consolidation reduce price competitiveness gains of member country vis-à-vis other euro area members. Unlike unilateral reforms, the area-wide measures are complemented by monetary accommodation that leads to temporary depreciation of the euro exchange rate, however. The euro depreciation improves price competitiveness vis-à-vis the rest of the world in the short and medium term.

Accommodative monetary policy also mitigates demand-dampening real interest rate effects of structural reforms, which strengthens consumption, investment and domestic activity. Import demand starts rising early after the implementation of product and labour market reforms or falls less strongly in the case of fiscal consolidation. The frontloading of domestic demand growth associated with lower real interest rates and earlier expansion dampens the initial improvement of trade and current account balances.

Figure 4.7 Area-wide 1 percentage-point price mark-up reductions in T and NT sectors

Figure 4.8: Area-wide 1 percent real wage reduction

Figure 4.9: Area-wide 5 percentage-point reduction of public debt to GDP

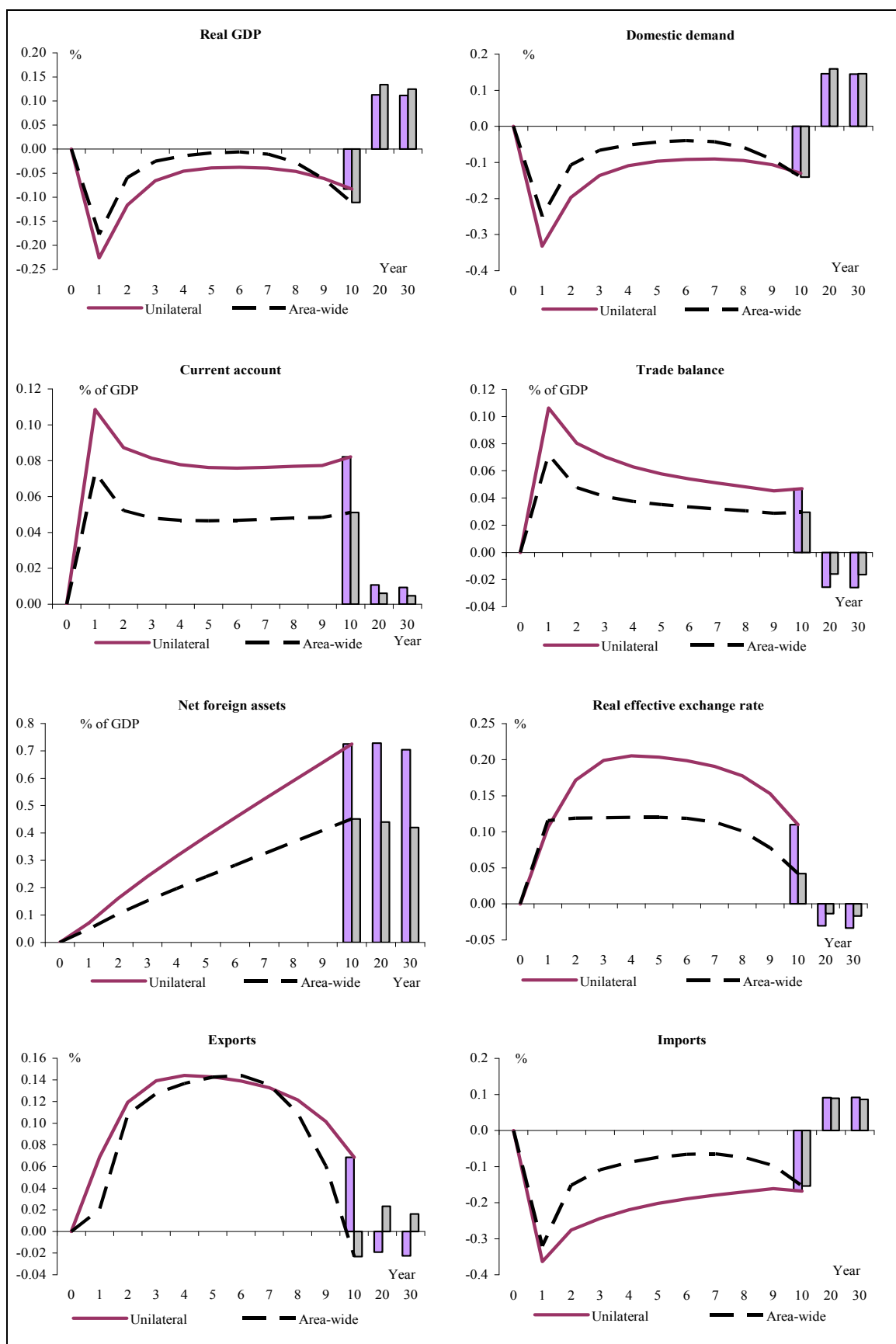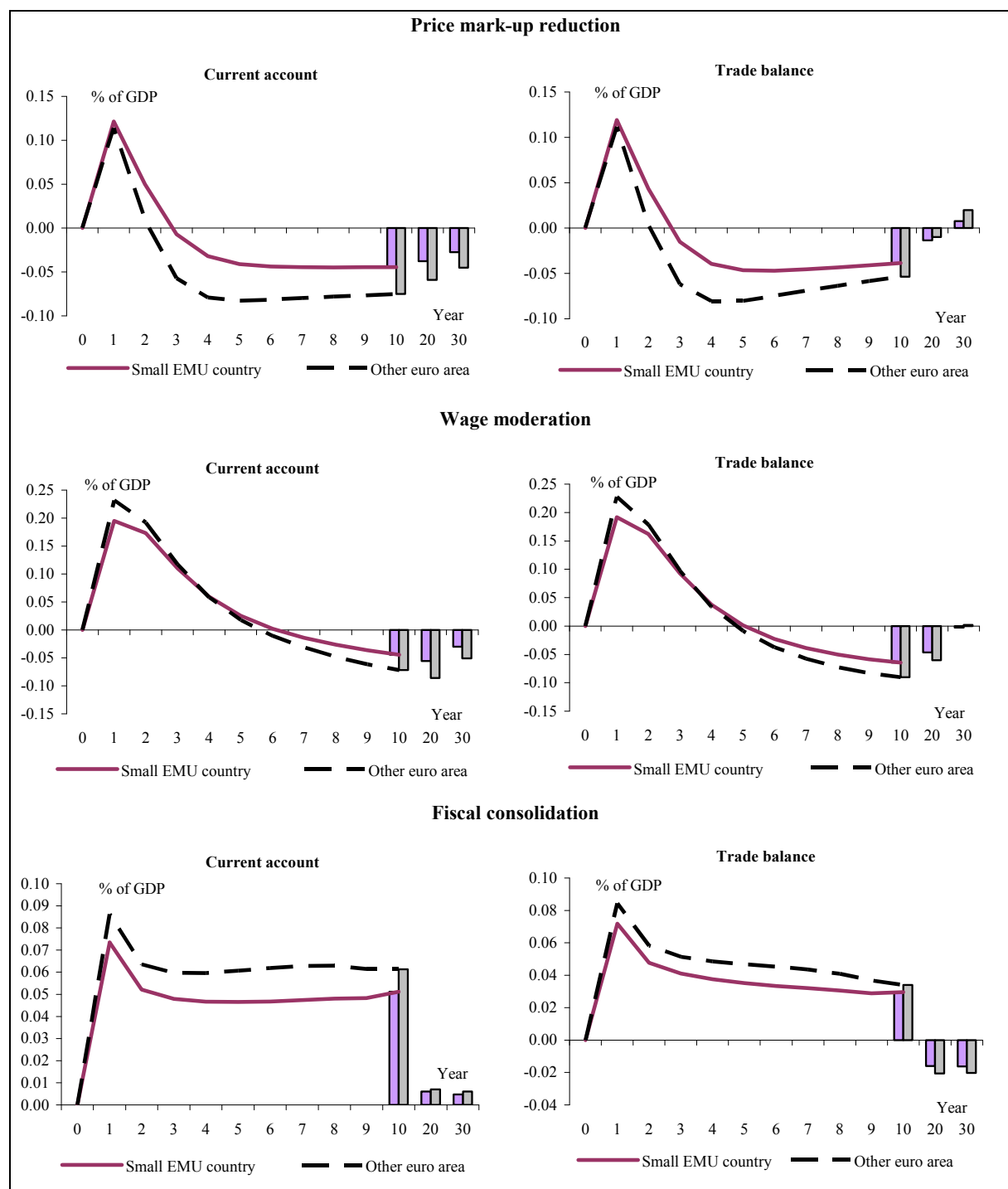
Real GDP

Domestic demand

Current account

Trade balance

Net foreign assets

Real effective exchange rate

Exports

Imports

Figure 4.10: Area-wide reforms and area-wide external balances

EMU-wide reform implementation that dampens the country-level trade and current account balance improvement compared to unilateral reforms also dampens net capital outflows. To the extent that capital inflow increases productive investment, instead of fuelling consumption and housing bubbles, net outflows reduce economic prospect in the longer term. To the extent that net capital outflows signal the correction of previous overborrowing, the reversal may increase the economy's resilience and avoid a replay of debt crises, however.

Area-wide structural reforms do not narrow current account differentials between EMU member countries, but improve bilateral balances with the rest of the world. Figure 4.10 displays the reaction of current account and trade balances of the small average EMU member country and the rest of the euro area in reaction to area-wide product market reform, labour market reform and expenditure-based fiscal consolidation, i.e. the scenarios of Figures 4.7 to 4.9. It illustrates the similar behaviour of external balances in the small EMU member economy and other euro area countries in reaction to similar reform impulses. The similar impact of area-wide reforms on external positions implies that trade and current account balance adjustment reflects changes vis-à-vis the rest of the world instead of intra-EMU rebalancing.

4.5 Robustness checks

The previous simulations provide a fairly uniform picture. Structural reforms improve trade and current account balances of an economy in monetary union on impact, namely for a period of 5-10 years. Permanent product and labour market reform lead to permanent improvements in price competitiveness, but do not equally imply permanent shifts in external balances and NFA positions due to the countervailing income effect and its impact on import demand.

This subsection presents two modifications to the set-up to assess the robustness of the conclusions along two key dimensions. The robustness checks investigate, first, the impact of higher trade price elasticities and, second, the impact of alternative initial conditions, namely large initial external deficits and foreign debt levels, on the impact of structural reforms on external balances.

4.5.1 The impact of higher trade elasticities

Figure 4.11 compares the effect of 1 percentage-point tradable and non-tradable price mark-up reduction in the small EMU member economy under alternative trade elasticity values. Series for the standard calibration are identical to those presented in Figure 4.1, with an elasticity of substitution of 1.5 between domestic and foreign tradable goods and an elasticity of substitution of 0.9 between foreign tradables of different origin. The scenario with higher trade elasticity parameters doubles the two values to 3 and 1.8.

The standard calibration of 1.5 and 0.9 is compatible with estimated versions of QUEST (Ratto et al., 2009). DSGE models of EMU countries adopt or estimate similar (e.g., Boscá et al., 2010) or even lower (e.g., Andrés et al., 2010) parameter values. The estimates of Imbs and Méjean (2010), on the other hand, suggest values of up to 3 for the aggregate price elasticity of euro area trade. Higher elasticity values imply that given price adjustment has larger volume effects, or, equivalently, given volume effects requires less relative price adjustment.

The higher-elasticity series in Figure 4.11 apply the value of 3.0 to the price elasticity of exports and imports of the reforming EMU member country alike and show that a higher price elasticity of trade does not increase, but rather reduce the positive initial impact of product market reform on external balances.

Figure 4.11: Price mark-up reduction with alternative trade elasticities
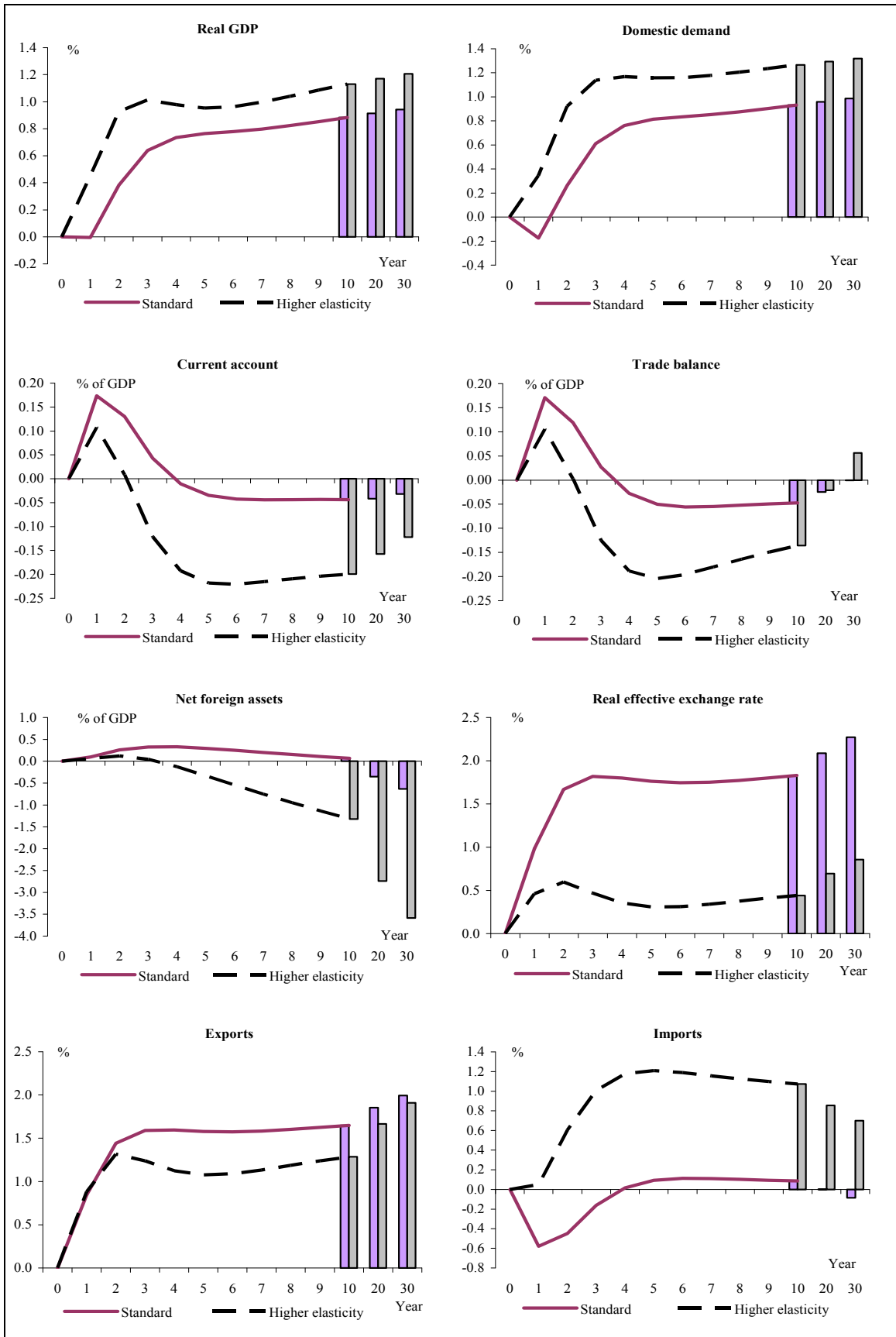
The doubling of the trade elasticity reduces the terms-of-trade decline and REER depreciation compared to the relative price adjustment under the standard calibration by more than ½. The adjustment combines comparable increases in export volumes with smaller terms-of-trade adjustment. Import demand rises even in the short run. The smaller price adjustment reduces the demand-dampening short-term increase in real interest rates and more moderate real depreciation contains the associated loss of purchasing power of incomes.

Contrary to the initial decline under the standard calibration, domestic demand expands from the beginning in the setting with higher trade elasticity. Investment growth is particularly strong and financed through net capital inflows. The income effect of structural reform quickly neutralises the competitiveness effect on external balances. Trade balance and current account improvement peaks at half the size of the improvement under the standard calibration and reverts to negative territory already within three years.

Taken together, higher trade price elasticity amplifies the positive GDP and income effects of structural reforms, but reduces the size and duration of positive net trade and current account responses. Increasing the price elasticity of trade strengthens net capital inflows relative to the benchmark calibration, which here finance additional investment in the reforming country.

4.5.2 The impact of initial external deficits and debt

The second robustness check looks at whether the effect of product market reform on domestic activity and external balances depends on the initial conditions of the economy, namely on its initial current account deficit and level of foreign indebtedness.

Figure 4.12 compares the impact of 1 percentage-point price mark-up reduction for tradable and non-tradable goods in the standard setting (Figure 4.1) to an alternative baseline in which the economy starts at pre-reform current account deficits of 6 percent of GDP and initial net foreign debt of 55 percent of GDP. These deficit and debt levels approximate the average foreign position of, e.g., the Spanish economy since the start of EMU.

The comparison suggests that starting from high levels of external deficits and debt does not significantly alter the effects of and gains from product market reform. If anything, the improvement of trade and current account balances is moderately stronger if the country has large foreign debt.

The decline of domestic tradable prices improves the price competitiveness of domestic tradable goods and stimulates net exports as foreign demand for domestic tradables rises and domestic agents substitute domestic for imported tradable goods. The particular effect of high foreign debt is a denominator effect. The reform-related domestic price level reduction increases the euro-denominated debt and interest burden in real domestic terms.[7]

The denominator-driven initial increase in the real value of external debt dampens the income effect of product market reform. Import demand falls more steeply and trade/current account balances improve (modestly) more strongly than with initially balanced external positions.

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[7] The effect is visible in Figure 4.12. The economy-wide price mark-up reduction reduces the GDP deflator and nominal GDP on impact by approximately 1 percent. Given the initial foreign debt stock of 55 percent of GDP, the denominator effect increases the euro-denominated foreign debt in terms of nominal GDP by around 0.6 percent. Together with the current account balance improvement of circa 0.2 percent of GDP, the NFA-to-GDP ratio declines initially by circa 0.4 percentage points.

Figure 4.12: Price mark-up reduction with different initial foreign positions
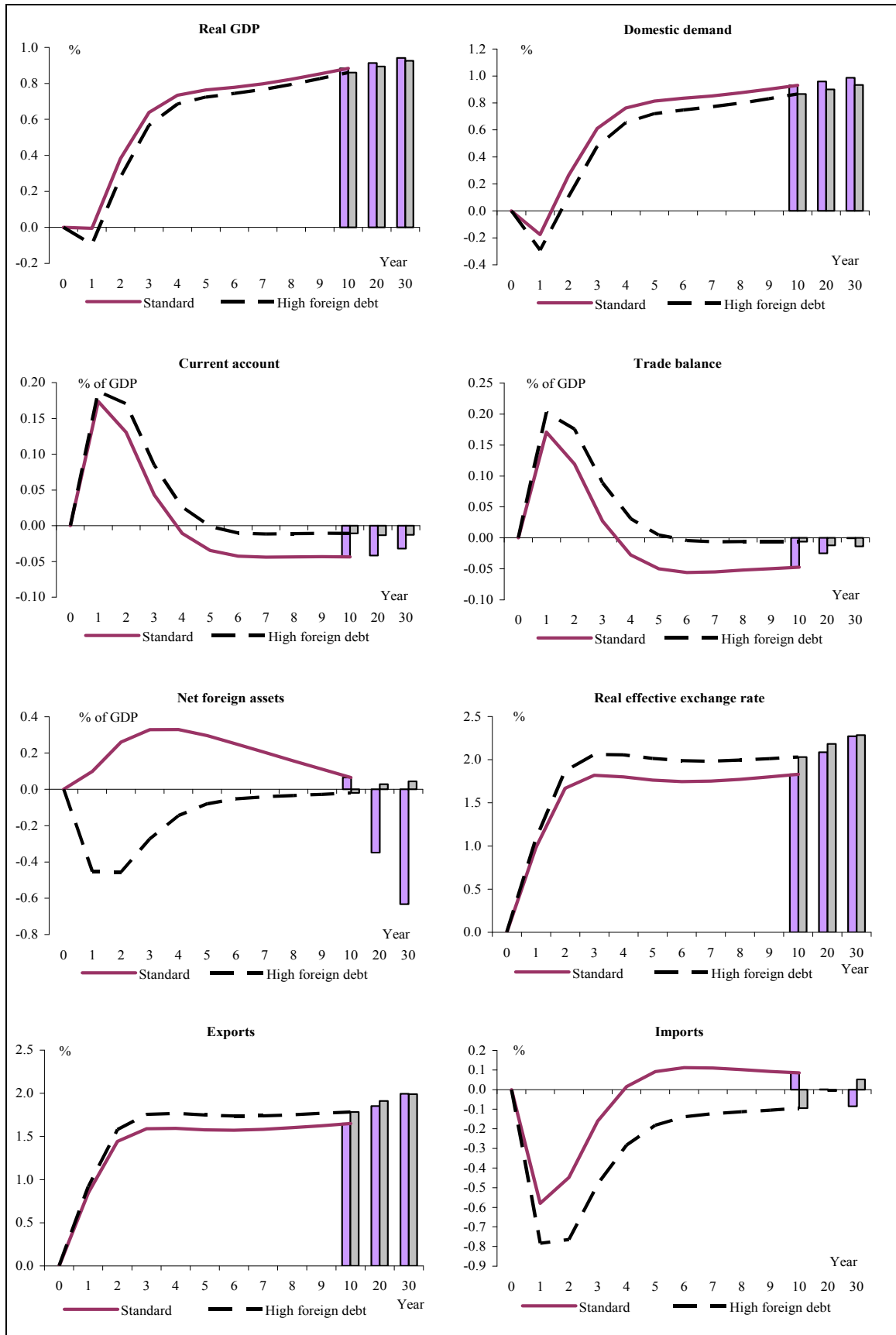
5. CONCLUSIONS

The paper has used a 3-region version (average small EMU member country, other euro area, rest of the world) of QUEST III to assess the temporary and permanent general-equilibrium effects of effective structural reforms on external balances in the euro area. The simulations have focused on the reforming EMU member economy as example for euro area countries with external adjustment need.

In a first step, the paper looks at imbalance *prevention*, namely the impact of price/wage flexibility and prudent lending behaviour on the response to bubble shocks. The simulatedimpact of reducing average price and wage durations below current levels, i.e. increasing price and wage flexibility while real frictions are kept constant, on the adjustment paths is modest and case-dependent. While flexible price adjustment dampens the deterioration of external balances in response to, e.g., housing/consumption bubbles, increased (upward) wage flexibility tends to amplify wage growth, net imports and borrowing from abroad in such situation.

Prudent lending behaviour which does not relax borrowing constraints in the event of house price bubbles reduces construction investment, the trade balance and current account deterioration and foreign debt accumulation by preventing overborrowing on high nominal housing wealth. The argument equally applies to other bubble shocks, e.g. temporary shifts in perceived stock market or country risk. Mechanisms that limit borrowing in response to temporary shocks also mitigate the subsequent contraction.

Secondly, the paper considers the contribution of reforms which permanently shift equilibrium output, employment and income levels to imbalance *correction*. It simulates the impact of product market reform (lower price mark-ups), wage moderation (lower wage mark-ups) and fiscal consolidation on the current account and foreign asset positions over different time horizons. The no-reform scenario serves as the benchmark for comparison.

Price/wage mark-up reduction and fiscal consolidation improve trade and current account balances over periods of 5-6 years. The improvement follows from the permanent competitiveness gain and the initial contractionary effect of high real interest rates and fiscal consolidation. Terms-of-trade adjustment as the basis for improved price competitiveness mitigates the positive impact of growing net export volumes on the trade balance, however.

The positive impact of structural reforms on trade and current account rebalancees reaches is maximum already in early years, when the impact of competitiveness gains on external balances clearly dominates the the impact of the income effect. The current account improvments peak at 0.2, 0.3 and 0.1 percent of real GDP in response to 1 percentage-point price mark-up reduction, 1 percent real wage moderation and 5 percentage-point reduction of government debt to GDP. On the basis of these numbers, the large competitiveness improvement that is necessary in some euro-area economies requires quantitatively sizable measures.

While the competitiveness gain dominate the impact on external positions as long as domestic demand remains weak, trade and current account improvements diminish as the income effect of structural reforms gains strenght in the longer term and leads to growing import demand and capital inflows. The improvement in NFA positions that results from improvements in the current account is more persistent over time than the current account improvement itself.

 Successful product and labour market reform improve competitiveness and raise domestic income. Provided that imports and domestic goods are imperfect substitutes, income growth also leads to higher import demand. Given that domestic activity and income growth result from improved competitiveness, the competitiveness gains dominate the impact of reforms on external balances in the short/medium term; the income effect develops full impact only in the medium/longer run.

In sum, the simulation results suggest that structural economic reforms targeting (mainly) supply-side weaknesses help regaining competitiveness in economies with competitiveness problems. At the same time, the lasting long-term rebalancing of external accounts also requires the correction of demand imbalances.

The simulations emphasise the importance of reforms relative to the euro area average to regain competitiveness and achieve rebalancing in monetary union. Reforms at the pace of other EMU members may increase net trade positions vis-à-vis the rest of the world (conditional on monetary policy accommodation of structural reforms), but do not reduce disparities inside the euro area.

Differences in the initial levels of foreign borrowing and foreign debt have only modest quantitative impact on the effect of structural reforms on external balances. Reforms that generate real devaluation and improve price competitiveness of domestic tradable goods initially increase the size of outstanding euro-denominated foreign debt in real domestic terms. The larger initial debt burden also strengthens the subsequent external adjustment by weakening and delaying positive income effects, however.

The decline of trade balance and current account improvements in the long run is plausible in dynamic general equilibrium and the mirror image of the limitations on external borrowing and debt accumulation. Economies with declining trade competitiveness will sooner or later loose the ability to service outstanding external debt and sustain high levels of domestic demand. Foreign lenders, on the other hand, buy foreign assets as intertemporal income transfer, so that present net lending should imply higher net imports in future periods.

The simulation results complement empirical studies on the effect of structural policies on external adjustment. The impulse responses support key findings of the empirical literature, but also add some qualification:

Biroli et al. (2010) estimate the impact of product/labour market regulation on REERs and find that regulatory reforms supports relative price adjustment to restore price competitiveness. The simulations in this paper replicate the result. Price/wage mark-up reductions improve the price competitiveness persistently through real depreciation. The general-equilibrium analysis also emphasises the income effect of successful reforms, however, which dampens current account improvement in the long term. The strength and timing of competitiveness and income effects depend on the nominal and real adjustment frictions in the economy and current economic conditions. The competitiveness effect prevails in periods of weak domestic demand.

Instead of analysing REER adjustment, Berger and Nitsch (2010) and Zemanek et al. (2010) look directly at the impact of structural policies on bilateral trade balances and find that stricter product/labour market regulation deteriorates the net trade account. Given the relatively short lag lenght of reform indicators in the regressions, the authors are likely to capture

predominantely the competitiveness effect of reforms. The countervailing income effect on the trade/current account balance that materialises in the longer term enters the regressions through the lagged dependent variable. The Berger and Nitsch (2010) result that GDP growth differentials reduce bilateral trade surpluses also illustrates the impact of domestic income growth on external accounts.

The QUEST simulations are also compatible with the estimates in Kennedy and Sløk (2005) and Kerdrain et al. (2010). Kennedy and Sløk (2005) find positive short-term effects of product market liberalisation and negative ones of lagged external surpluses on present current account positions. Kerdrain et al. (2010) find little significant direct impact of structural reforms and conclude that the long-term current account positions of OECD countries are primarily driven by demographic trends, productivity growth, terms-of-trade dynamics and social security systems, variables that do, however, partly reflect the impact of structural reforms.

Finally, Jaumotte and Sodsriwiboon (2010) find that the current account deficits of euro area countries reflect primarily low private saving rates, and that imbalances have been fuelled by financial liberalisation and growing dependency ratios. This finding stresses the importance of regulatory reform to prevent overborrowing in the future.

REFERENCES

Andrés, J., S. Hurtado, E. Ortega and C. Thomas (2010): "Spain in the Euro: A General Equilibrium Analysis," Journal of the Spanish Economic Association, Vol. 1, No. 1, 67-95.

Badinger, H. (2007): "Has the EU's Single Market Programme Fostered Competition? Testing for a Decrease in Mark-up Ratios in EU Industries," Oxford Bulletin of Economics and Statistics, Vol. 69, No. 4, 497-519.

Berger, H. and V. Nitsch (2010): "The Euro's Effect on Trade Imbalances," IMF Working Paper 10/226.

Biroli, P., G. Mourre and A. Turrini (2010): "Adjustment in the Euro Area and Regulation of Product and Labour Markets: An Empirical Assessment," CEPR Discussion Paper 8010.

Blanchard, O. (2007): "Adjustment within the Euro: The Difficult Case of Portugal," Portuguese Economic Journal, Vol. 6, No. 1, 1-21.

Blanchard, O. (2007a): "Current Account Deficits in Rich Countries," IMF Staff Papers, Vol. 54, No. 2, 191-219.

Blanchard, O. and F. Giavazzi (2002): "Current Account Deficits in the Euro Area: The End of the Feldstein Horioka Puzzle?" Brookings Papers on Economic Activity 33, No. 2, 147-186.

Boscá, J., A. Díaz, R. Doménech, J. Ferri, E. Pérez and L. Puch (2010): "A Rational Expectations Model for Simulation and Policy Evaluation of the Spanish Economy," Journal of the Spanish Economic Association, Vol. 1, No. 1, 135-169.

Burriel, P., J. Fernández-Villaverde and J. Rubio-Ramírez (2010): "MEDEA: A DSGE Model for the Spanish Economy," Journal of the Spanish Economic Association, Vol. 1, No. 1, 175-243.

D'Auria, F., A. Pagano, M. Ratto and J. Varga (2009): "A Comparison of Structural Reform Scenarios Across the EU Member States: Simulation-Based Analysis Using the QUEST Model with Endogenous Growth," European Economy Economic Paper 392.

Druant, M., S. Fabiani, G. Kezdi, A. Lamo, F. Martins and R. Sabbatici (2009): "How Are Firms' Wages and Prices Linked: Survey Evidence in Europe," ECB Working Paper 1048.

European Commission (2010): "Surveillance of Intra-Euro-Area Competitiveness and Imbalances," DG Economic and Financial Affairs, European Economy 1.

Everaert, L. and W. Schule (2008): "Why It Pays to Synchronize Structural Reforms in the Euro Area across Markets and Countries," IMF Staff Papers, Vol. 55, No. 2, 356-366.

Gourinchas, P. (2002): "Comments on Current Account Deficits in the Euro Area: The End of the Feldstein-Horioka Puzzle?" Brookings Papers on Economic Activity 33, No. 2, 187-209.

Imbs, J. and I. Méjean (2010): "Trade Elasticities: A Final Report for the European Commission," European Economy Economic Papers 432.

Jaumotte, F. and P. Sodsriwiboon (2010): "Current Account Imbalances in the Southern Euro Area," IMF Working Paper 10/139.

Kennedy, M. and T. Sløk (2005): "Structural Policy Reforms and External Imbalances," OECD Economics Department Working Paper 415.

Kerdrain, C., I. Koske and I. Wanner (2010): "The Impact of Structural Policies on Saving, Investment and Current Accounts," OECD Economics Department Working Paper 815.

Knell, M. (2010): "Nominal and Real Wage Rigidities: In Theory and in Europe," ECB Working Paper 1180.

Kolasa, M. (2010): "Real Convergence and its Illusions," ECB Working Paper 1231.

Obstfeld, M. and K. Rogoff (2005): "Global Current Account Imbalances and Exchange Rate Adjustments," Brookings Papers on Economic Activity, Vol. 36, No. 1, 67-146.

Ratto, M., W. Roeger and J. in't Veld (2009): "QUEST III: An Estimated Open-Economy DSGE Model of the Euro Area with Fiscal and Monetary Policy," Economic Modelling, Vol. 26, No. 1, 222-233.

Roeger, W., J. Varga and J. in't Veld (2008): "Structural Reforms in the EU: A Simulation-Based Analysis Using the QUEST Model with Endogenous Growth," European Economy Economic Paper 351.

Roeger W. and J. in't Veld (2009): "Fiscal Policy with Credit Constrained Households," European Economy Economic Paper 357.

Roeger W. and J. in't Veld (2010): "Fiscal Stimulus and Exit Strategies in the EU: A Model-Based Analysis," European Economy Economic Paper 426.

Ruscher, E., and G. Wolff (2009): "External Rebalancing is not just an Exporters' Story: Real Exchange Rates, the Non-Tradable Sector and the Euro," European Economy Economic Paper 375.

Schmitz, B. and J. von Hagen (2009): "Current Account Imbalances and Financial Integration in the Euro Area," CEPR Discussion Paper 7262.

Sinn, H.-W. (2010): "Rescuing Europe," CESifo Forum Special Issue, Vol. 11, 1-22.

Zemanek, H., A. Belke and G. Schnabl (2010): "Current Account Balances and Structural Adjustment in the Euro Area," International Economics and Economic Policy 7, 83-127.

ANNEX: DETAILED SIMULATION RESULTS

A. Flexibility and the resilience of external positions

Figure 3.1: Impulse responses for 500 basis-point housing bubble

Baseline calibration of adjustment frictions:

Small EMU member

Data Set by Archive - Percent Error

         TEMP_SIM_PCER

	2011A	2012A	2013A	2014A	2015A	2016A	2017A	2018A	2019A	2020A	2030A	2040A
GDP.REAL_PCER	0.66	0.91	0.87	0.79	0.70	0.60	0.50	0.39	0.27	0.15	-0.40	-0.29
OUTPUT.T_PCER	0.06	-0.17	-0.43	-0.62	-0.74	-0.80	-0.81	-0.80	-0.77	-0.71	0.00	0.22
OUTPUT.NT_PCER	1.16	1.69	1.77	1.74	1.65	1.53	1.37	1.18	0.97	0.73	-0.66	-0.64
CAPITAL.T_PCER	0.01	0.01	-0.01	-0.05	-0.11	-0.18	-0.26	-0.33	-0.41	-0.48	-0.67	-0.37
CAPITAL.NT_PCER	0.02	0.07	0.11	0.12	0.12	0.09	0.04	-0.03	-0.10	-0.19	-0.82	-0.80
EMPLOYMENT_PCER	0.75	1.10	1.09	1.03	0.95	0.86	0.75	0.63	0.50	0.37	-0.23	-0.16
.EMPLOYMENT.T_PCER	0.61	0.85	0.79	0.71	0.63	0.54	0.45	0.36	0.27	0.17	-0.15	-0.06
.EMPLOYMENT.NT_PCER	0.97	1.49	1.55	1.52	1.45	1.34	1.20	1.04	0.86	0.66	-0.37	-0.33
DEMAND.DOM_PCER	0.87	1.21	1.18	1.08	0.97	0.85	0.72	0.59	0.44	0.28	-0.56	-0.48
CONSUMPTION_PCER	-1.13	-2.17	-2.69	-2.88	-2.82	-2.57	-2.21	-1.79	-1.33	-0.85	0.74	0.34
.CLC_PCER	0.36	0.78	0.93	0.96	0.92	0.86	0.78	0.69	0.58	0.46	-0.53	-0.52
.CCC_PCER	-5.79	-10.45	-12.34	-12.80	-12.31	-11.12	-9.53	-7.75	-5.85	-3.90	1.19	-1.13
.CNLC_PCER	0.22	0.09	-0.16	-0.33	-0.42	-0.44	-0.41	-0.35	-0.26	-0.14	1.19	1.45
INVESTMENT.CAPITAL_PCER	0.62	0.76	0.39	-0.10	-0.58	-1.00	-1.36	-1.64	-1.85	-1.99	-1.03	-0.17
.INVESTMENT.T_PCER	0.17	-0.03	-0.38	-0.70	-0.94	-1.11	-1.22	-1.30	-1.33	-1.33	-0.42	0.04
.INVESTMENT.NT_PCER	0.96	1.35	0.98	0.36	-0.31	-0.92	-1.46	-1.90	-2.25	-2.49	-1.48	-0.33
INVESTMENT.HOUSE_PCER	29.99	51.15	59.49	62.15	60.78	56.28	49.75	41.91	33.02	23.31	-24.62	-21.77
GOVERNMENT.PURCHASES_PCER	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EXPORTS_PCER	-0.36	-0.68	-0.89	-0.99	-1.03	-1.03	-1.00	-0.94	-0.86	-0.76	0.30	0.50
IMPORTS_PCER	0.69	1.04	1.10	1.06	0.99	0.91	0.82	0.72	0.61	0.49	-0.58	-0.69
REAL.WAGE_PCER	0.04	0.14	0.14	0.09	0.05	0.03	0.02	0.01	0.01	-0.00	-0.22	-0.21
PRICE.LEVEL.GDP_PCER	0.42	0.90	1.20	1.36	1.43	1.45	1.43	1.37	1.29	1.18	-0.12	-0.47
.PRICE.LEVEL.T_PCER	0.23	0.54	0.75	0.88	0.94	0.97	0.97	0.95	0.91	0.85	0.01	-0.28
.PRICE.LEVEL.NT_PCER	0.41	0.87	1.13	1.28	1.34	1.36	1.33	1.28	1.20	1.10	-0.09	-0.40
.PRICE.LEVEL.HOUSE_PCER	11.77	15.64	15.96	16.01	16.04	16.05	16.06	16.06	16.06	16.05	15.85	15.73
EXPORT.PRICES_PCER	0.23	0.54	0.75	0.88	0.94	0.97	0.97	0.95	0.91	0.85	0.01	-0.28
IMPORT.PRICES_PCER	-0.09	-0.13	-0.15	-0.15	-0.13	-0.10	-0.07	-0.03	0.02	0.07	0.32	0.24
TOT_PCER	0.32	0.67	0.90	1.03	1.07	1.07	1.04	0.98	0.89	0.79	-0.32	-0.53
REER_PCER	-0.51	-1.03	-1.34	-1.50	-1.56	-1.54	-1.49	-1.39	-1.26	-1.11	0.45	0.72
EXR_PCER	-0.14	-0.16	-0.17	-0.17	-0.15	-0.12	-0.09	-0.05	-0.00	0.04	0.30	0.23

Data Set by Archive - Error

         TEMP_SIM_ER

	2011A	2012A	2013A	2014A	2015A	2016A	2017A	2018A	2019A	2020A	2030A	2040A
NOM.INT.RATE_ER	-0.01	-0.01	0.00	0.01	0.03	0.03	0.04	0.05	0.05	0.05	0.00	-0.01
REAL.INT.RATE_ER	-0.58	-0.36	-0.20	-0.09	-0.01	0.04	0.08	0.12	0.15	0.17	0.08	-0.01
INFL.GDP_ER	0.63	0.40	0.24	0.12	0.05	-0.00	-0.03	-0.06	-0.09	-0.12	-0.08	-0.01
INFL.PC_ER	0.53	0.33	0.19	0.10	0.04	0.00	-0.02	-0.05	-0.07	-0.09	-0.07	-0.01
LABOUR.TAX.RATE_ER	-0.10	-0.29	-0.41	-0.46	-0.46	-0.44	-0.41	-0.36	-0.31	-0.25	0.25	0.22
GOV.DEBT.GDP_ER	-0.48	-0.98	-1.14	-1.12	-1.00	-0.83	-0.62	-0.41	-0.20	0.01	0.82	0.19
GOV.BALANCE.GDP_ER	0.24	0.20	0.06	-0.04	-0.09	-0.12	-0.13	-0.13	-0.12	-0.11	0.04	0.05
GOV.EXP.GDP_ER	-0.45	-0.64	-0.62	-0.58	-0.53	-0.47	-0.40	-0.33	-0.25	-0.17	0.22	0.17
GOV.REV.GDP_ER	-0.23	-0.49	-0.62	-0.67	-0.66	-0.61	-0.54	-0.46	-0.36	-0.26	0.29	0.22
TRADE.BAL.GDP_ER	-0.21	-0.30	-0.31	-0.30	-0.27	-0.25	-0.22	-0.20	-0.17	-0.13	0.16	0.19
CURRENT.ACC.GDP_ER	-0.21	-0.32	-0.34	-0.34	-0.34	-0.33	-0.32	-0.31	-0.29	-0.27	-0.01	0.06
NFA.GDP_ER	-0.11	-0.40	-0.73	-1.06	-1.38	-1.69	-1.98	-2.26	-2.52	-2.76	-3.55	-2.67

3-quarter average price duration:

Small EMU member

Data Set by Archive - Percent Error

         TEMP_SIM_PCER

	2011A	2012A	2013A	2014A	2015A	2016A	2017A	2018A	2019A	2020A	2030A	2040A
GDP.REAL_PCER	0.63	0.86	0.82	0.76	0.69	0.59	0.49	0.38	0.26	0.14	-0.39	-0.29
OUTPUT.T_PCER	0.01	-0.25	-0.50	-0.66	-0.76	-0.81	-0.82	-0.81	-0.77	-0.72	0.01	0.22
OUTPUT.NT_PCER	1.11	1.61	1.70	1.69	1.63	1.51	1.36	1.17	0.96	0.72	-0.65	-0.64
CAPITAL.T_PCER	0.01	0.01	-0.02	-0.06	-0.13	-0.19	-0.27	-0.34	-0.42	-0.49	-0.67	-0.36
CAPITAL.NT_PCER	0.02	0.06	0.10	0.11	0.11	0.08	0.03	-0.04	-0.11	-0.19	-0.81	-0.79
EMPLOYMENT_PCER	0.73	1.06	1.06	1.02	0.95	0.86	0.75	0.63	0.50	0.37	-0.23	-0.16
.EMPLOYMENT.T_PCER	0.59	0.81	0.76	0.70	0.62	0.54	0.45	0.36	0.27	0.17	-0.14	-0.06
.EMPLOYMENT.NT_PCER	0.94	1.45	1.52	1.50	1.44	1.33	1.20	1.04	0.86	0.66	-0.36	-0.32
DEMAND.DOM_PCER	0.84	1.14	1.12	1.05	0.95	0.84	0.71	0.58	0.43	0.28	-0.55	-0.48
CONSUMPTION_PCER	-1.16	-2.24	-2.75	-2.92	-2.85	-2.59	-2.22	-1.80	-1.34	-0.86	0.75	0.35
.CLC_PCER	0.29	0.66	0.81	0.85	0.84	0.80	0.74	0.65	0.55	0.44	-0.51	-0.50

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.CCC_PCER                     -5.79  -10.55  -12.43  -12.86  -12.35  -11.15   -9.55   -7.77   -5.87   -3.92    1.21   -1.11
.CNLC_PCER                     0.20    0.05   -0.18   -0.33   -0.41   -0.43   -0.40   -0.34   -0.25   -0.14    1.19    1.46
INVESTMENT.CAPITAL_PCER        0.56    0.67    0.32   -0.14   -0.60   -1.00   -1.35   -1.63   -1.84   -1.97   -1.01   -0.17
.INVESTMENT.T_PCER             0.12   -0.10   -0.44   -0.73   -0.95   -1.11   -1.23   -1.30   -1.33   -1.32   -0.41    0.04
.INVESTMENT.NT_PCER            0.90    1.25    0.90    0.31   -0.33   -0.92   -1.45   -1.89   -2.23   -2.47   -1.46   -0.33
INVESTMENT.HOUSE_PCER         29.96   51.05   59.39   62.07   60.73   56.24   49.73   41.89   33.00   23.31  -24.58  -21.76
GOVERNMENT.PURCHASES_PCER      0.00    0.00    0.00    0.00    0.00    0.00    0.00    0.00    0.00    0.00    0.00    0.00
EXPORTS_PCER                  -0.39   -0.72   -0.91   -1.00   -1.04   -1.03   -1.00   -0.94   -0.86   -0.76    0.29    0.50
IMPORTS_PCER                   0.68    0.99    1.05    1.02    0.96    0.89    0.81    0.72    0.61    0.50   -0.57   -0.68
REAL.WAGE_PCER                -0.05    0.00    0.02    0.00   -0.01   -0.01   -0.01   -0.01   -0.01   -0.02   -0.20   -0.21
PRICE.LEVEL.GDP_PCER           0.47    0.96    1.23    1.37    1.44    1.45    1.43    1.38    1.30    1.19   -0.12   -0.47
.PRICE.LEVEL.T_PCER            0.25    0.58    0.78    0.89    0.95    0.97    0.97    0.96    0.92    0.86    0.01   -0.28
.PRICE.LEVEL.NT_PCER           0.47    0.92    1.16    1.29    1.35    1.36    1.34    1.29    1.21    1.11   -0.09   -0.40
.PRICE.LEVEL.HOUSE_PCER       11.79   15.65   15.97   16.02   16.04   16.05   16.06   16.06   16.06   16.05   15.84   15.73
EXPORT.PRICES_PCER             0.25    0.58    0.78    0.89    0.95    0.97    0.97    0.96    0.92    0.86    0.01   -0.28
IMPORT.PRICES_PCER            -0.09   -0.13   -0.14   -0.14   -0.13   -0.10   -0.07   -0.03    0.02    0.07    0.32    0.24
TOT_PCER                       0.35    0.71    0.92    1.03    1.08    1.07    1.04    0.98    0.90    0.79   -0.31   -0.52
REER_PCER                     -0.56   -1.08   -1.37   -1.51   -1.56   -1.54   -1.49   -1.40   -1.27   -1.12    0.44    0.72
EXR_PCER                      -0.15   -0.16   -0.16   -0.16   -0.15   -0.12   -0.09   -0.05   -0.00    0.04    0.30    0.22


Data Set by Archive - Error

        TEMP_SIM_ER

                              2011A   2012A   2013A   2014A   2015A   2016A   2017A   2018A   2019A   2020A   2030A   2040A


NOM.INT.RATE_ER               -0.01   -0.01    0.00    0.01    0.02    0.03    0.04    0.05    0.05    0.05    0.00   -0.01
REAL.INT.RATE_ER              -0.62   -0.34   -0.18   -0.08   -0.01    0.04    0.08    0.12    0.15    0.17    0.08   -0.01
INFL.GDP_ER                    0.70    0.38    0.21    0.11    0.04   -0.00   -0.03   -0.06   -0.09   -0.12   -0.08   -0.01
INFL.PC_ER                     0.59    0.30    0.17    0.09    0.04    0.00   -0.02   -0.05   -0.07   -0.09   -0.07   -0.01
LABOUR.TAX.RATE_ER            -0.10   -0.28   -0.38   -0.43   -0.43   -0.42   -0.38   -0.34   -0.29   -0.23    0.24    0.21
GOV.DEBT.GDP_ER               -0.47   -0.93   -1.07   -1.05   -0.94   -0.78   -0.60   -0.40   -0.20    0.01    0.79    0.18
GOV.BALANCE.GDP_ER             0.22    0.17    0.04   -0.04   -0.08   -0.11   -0.12   -0.12   -0.11   -0.10    0.04    0.05
GOV.EXP.GDP_ER                -0.44   -0.61   -0.60   -0.57   -0.52   -0.47   -0.40   -0.33   -0.25   -0.17    0.21    0.17
GOV.REV.GDP_ER                -0.24   -0.49   -0.61   -0.65   -0.64   -0.60   -0.53   -0.45   -0.35   -0.25    0.29    0.22
TRADE.BAL.GDP_ER              -0.20   -0.29   -0.29   -0.28   -0.26   -0.24   -0.22   -0.19   -0.17   -0.13    0.16    0.19
CURRENT.ACC.GDP_ER            -0.21   -0.30   -0.33   -0.33   -0.33   -0.32   -0.31   -0.30   -0.29   -0.27   -0.02    0.06
NFA.GDP_ER                    -0.11   -0.39   -0.70   -1.01   -1.32   -1.62   -1.91   -2.19   -2.44   -2.68   -3.49   -2.62
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4-quarter average wage duration:

Small EMU member

Data Set by Archive - Percent Error

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        TEMP_SIM_PCER

                              2011A   2012A   2013A   2014A   2015A   2016A   2017A   2018A   2019A   2020A   2030A   2040A


GDP.REAL_PCER                  0.65    0.88    0.82    0.75    0.67    0.58    0.48    0.38    0.26    0.14   -0.39   -0.29
OUTPUT.T_PCER                  0.05   -0.20   -0.48   -0.66   -0.77   -0.82   -0.83   -0.81   -0.78   -0.72    0.01    0.22
OUTPUT.NT_PCER                 1.17    1.69    1.74    1.70    1.63    1.51    1.35    1.17    0.96    0.72   -0.66   -0.64
CAPITAL.T_PCER                 0.01    0.01   -0.01   -0.06   -0.12   -0.20   -0.27   -0.35   -0.42   -0.49   -0.68   -0.37
CAPITAL.NT_PCER                0.02    0.06    0.10    0.11    0.11    0.07    0.02   -0.04   -0.12   -0.20   -0.82   -0.80
EMPLOYMENT_PCER                0.74    1.06    1.04    0.99    0.93    0.84    0.74    0.62    0.50    0.36   -0.23   -0.16
.EMPLOYMENT.T_PCER             0.59    0.80    0.74    0.67    0.60    0.53    0.44    0.36    0.26    0.17   -0.14   -0.05
.EMPLOYMENT.NT_PCER            0.95    1.46    1.51    1.49    1.42    1.32    1.19    1.03    0.85    0.66   -0.36   -0.32
DEMAND.DOM_PCER                0.87    1.19    1.14    1.04    0.94    0.83    0.71    0.57    0.42    0.27   -0.56   -0.48
CONSUMPTION_PCER              -1.12   -2.17   -2.71   -2.91   -2.85   -2.60   -2.23   -1.81   -1.35   -0.87    0.74    0.34
.CLC_PCER                      0.40    0.84    0.95    0.93    0.88    0.82    0.74    0.66    0.56    0.44   -0.53   -0.51
.CCC_PCER                     -5.75  -10.43  -12.36  -12.83  -12.35  -11.15   -9.55   -7.76   -5.87   -3.92    1.19   -1.12
.CNLC_PCER                     0.21    0.05   -0.21   -0.37   -0.44   -0.46   -0.42   -0.36   -0.27   -0.15    1.19    1.45
INVESTMENT.CAPITAL_PCER        0.59    0.69    0.32   -0.17   -0.63   -1.04   -1.38   -1.66   -1.87   -2.00   -1.02   -0.17
.INVESTMENT.T_PCER             0.15   -0.08   -0.44   -0.75   -0.97   -1.13   -1.24   -1.31   -1.34   -1.34   -0.42    0.04
.INVESTMENT.NT_PCER            0.93    1.28    0.89    0.27   -0.37   -0.96   -1.49   -1.92   -2.26   -2.50   -1.47   -0.33
INVESTMENT.HOUSE_PCER         30.05   51.20   59.49   62.11   60.74   56.24   49.72   41.89   32.99   23.29  -24.62  -21.77
GOVERNMENT.PURCHASES_PCER      0.00    0.00    0.00    0.00    0.00    0.00    0.00    0.00    0.00    0.00    0.00    0.00
EXPORTS_PCER                  -0.38   -0.73   -0.93   -1.02   -1.05   -1.04   -1.00   -0.94   -0.86   -0.76    0.30    0.50
IMPORTS_PCER                   0.73    1.09    1.12    1.06    0.98    0.89    0.81    0.71    0.61    0.49   -0.58   -0.69
REAL.WAGE_PCER                 0.09    0.23    0.18    0.10    0.04    0.02    0.01    0.01    0.01   -0.00   -0.22   -0.21
PRICE.LEVEL.GDP_PCER           0.45    0.96    1.26    1.40    1.46    1.47    1.44    1.38    1.30    1.19   -0.13   -0.47
.PRICE.LEVEL.T_PCER            0.25    0.59    0.80    0.91    0.96    0.98    0.98    0.96    0.92    0.86    0.00   -0.29
.PRICE.LEVEL.NT_PCER           0.44    0.93    1.19    1.32    1.37    1.37    1.34    1.29    1.21    1.10   -0.10   -0.40
.PRICE.LEVEL.HOUSE_PCER       11.78   15.65   15.98   16.03   16.05   16.06   16.07   16.07   16.07   16.06   15.85   15.73
EXPORT.PRICES_PCER             0.25    0.59    0.80    0.91    0.96    0.98    0.98    0.96    0.92    0.86    0.00   -0.29
IMPORT.PRICES_PCER            -0.09   -0.13   -0.14   -0.14   -0.12   -0.10   -0.06   -0.02    0.02    0.07    0.32    0.24
TOT_PCER                       0.34    0.72    0.94    1.05    1.09    1.08    1.04    0.98    0.90    0.79   -0.32   -0.53
REER_PCER                     -0.54   -1.09   -1.39   -1.53   -1.57   -1.55   -1.49   -1.40   -1.27   -1.11    0.46    0.72
EXR_PCER                      -0.15   -0.16   -0.17   -0.16   -0.14   -0.12   -0.08   -0.04    0.00    0.05    0.30    0.22


Data Set by Archive - Error

        TEMP_SIM_ER

                              2011A   2012A   2013A   2014A   2015A   2016A   2017A   2018A   2019A   2020A   2030A   2040A


NOM.INT.RATE_ER               -0.01   -0.01    0.00    0.01    0.02    0.03    0.04    0.05    0.05    0.05    0.00   -0.01
REAL.INT.RATE_ER              -0.62   -0.37   -0.18   -0.07    0.00    0.05    0.09    0.12    0.15    0.18    0.08   -0.01
INFL.GDP_ER                    0.68    0.42    0.22    0.10    0.03   -0.01   -0.04   -0.06   -0.09   -0.12   -0.08   -0.01
INFL.PC_ER                     0.57    0.34    0.18    0.08    0.03   -0.00   -0.03   -0.05   -0.07   -0.09   -0.07   -0.01
LABOUR.TAX.RATE_ER            -0.10   -0.29   -0.40   -0.44   -0.44   -0.42   -0.38   -0.34   -0.28   -0.23    0.24    0.21
GOV.DEBT.GDP_ER               -0.48   -0.97   -1.11   -1.07   -0.94   -0.77   -0.58   -0.38   -0.17    0.03    0.78    0.18
GOV.BALANCE.GDP_ER             0.23    0.18    0.03   -0.05   -0.10   -0.11   -0.12   -0.12   -0.11   -0.10    0.04    0.05
GOV.EXP.GDP_ER                -0.44   -0.61   -0.59   -0.56   -0.51   -0.46   -0.39   -0.32   -0.25   -0.16    0.21    0.17
```

```
GOV.REV.GDP_ER        -0.23   -0.48   -0.61   -0.65   -0.64   -0.59   -0.52   -0.44   -0.35   -0.25    0.29    0.22
TRADE.BAL.GDP_ER      -0.22   -0.31   -0.31   -0.29   -0.27   -0.24   -0.22   -0.19   -0.16   -0.13    0.16    0.19
CURRENT.ACC.GDP_ER    -0.22   -0.33   -0.35   -0.34   -0.33   -0.33   -0.32   -0.31   -0.29   -0.27   -0.01    0.06
NFA.GDP_ER            -0.12   -0.42   -0.75   -1.08   -1.40   -1.70   -2.00   -2.27   -2.53   -2.77   -3.56   -2.68
```

Prudent valuation of housing collateral:

Small EMU member

Data Set by Archive - Percent Error

        TEMP_SIM_PCER

```
                           2011A   2012A   2013A   2014A   2015A   2016A   2017A   2018A   2019A   2020A   2030A   2040A

GDP.REAL_PCER               0.54    0.81    0.80    0.74    0.65    0.56    0.45    0.34    0.23    0.11   -0.39   -0.28
OUTPUT.T_PCER              -0.01   -0.19   -0.42   -0.60   -0.71   -0.77   -0.79   -0.77   -0.73   -0.67    0.03    0.19
OUTPUT.NT_PCER              0.96    1.52    1.65    1.64    1.57    1.44    1.27    1.08    0.87    0.63   -0.67   -0.60
CAPITAL.T_PCER              0.01    0.01   -0.01   -0.05   -0.11   -0.18   -0.26   -0.33   -0.40   -0.47   -0.59   -0.29
CAPITAL.NT_PCER             0.02    0.06    0.09    0.11    0.10    0.06    0.01   -0.06   -0.13   -0.21   -0.76   -0.70
EMPLOYMENT_PCER             0.63    0.99    1.02    0.97    0.90    0.80    0.70    0.58    0.45    0.32   -0.25   -0.18
.EMPLOYMENT.T_PCER          0.50    0.76    0.74    0.67    0.59    0.50    0.42    0.33    0.24    0.14   -0.16   -0.08
.EMPLOYMENT.NT_PCER         0.82    1.35    1.45    1.44    1.37    1.26    1.12    0.96    0.78    0.58   -0.40   -0.33
DEMAND.DOM_PCER             0.70    1.06    1.08    1.01    0.90    0.78    0.65    0.51    0.36    0.21   -0.55   -0.44
CONSUMPTION_PCER           -1.26   -2.23   -2.67   -2.83   -2.76   -2.52   -2.16   -1.76   -1.31   -0.85    0.71    0.41
.CLC_PCER                   0.27    0.65    0.82    0.86    0.83    0.78    0.70    0.60    0.49    0.37   -0.54   -0.45
.CCC_PCER                  -5.82   -9.91  -11.44  -11.76  -11.24  -10.07   -8.52   -6.80   -4.97   -3.10    1.94    0.24
.CNLC_PCER                  0.02   -0.21   -0.47   -0.65   -0.74   -0.77   -0.74   -0.67   -0.57   -0.45    0.79    0.94
INVESTMENT.CAPITAL_PCER     0.55    0.67    0.31   -0.18   -0.65   -1.06   -1.40   -1.65   -1.83   -1.92   -0.80   -0.09
.INVESTMENT.T_PCER          0.14   -0.04   -0.38   -0.70   -0.94   -1.10   -1.21   -1.27   -1.28   -1.26   -0.29    0.08
.INVESTMENT.NT_PCER         0.87    1.21    0.83    0.21   -0.44   -1.03   -1.54   -1.94   -2.24   -2.43   -1.19   -0.22
INVESTMENT.HOUSE_PCER      28.35   49.13   57.55   60.26   58.91   54.38   47.85   40.00   31.12   21.47  -24.38  -21.08
GOVERNMENT.PURCHASES_PCER   0.00    0.00    0.00    0.00    0.00    0.00    0.00    0.00    0.00    0.00    0.00    0.00
EXPORTS_PCER               -0.32   -0.62   -0.81   -0.92   -0.97   -0.96   -0.92   -0.86   -0.77   -0.67    0.31    0.42
IMPORTS_PCER                0.52    0.87    0.97    0.95    0.89    0.81    0.72    0.61    0.50    0.38   -0.56   -0.56
REAL.WAGE_PCER              0.01    0.10    0.12    0.09    0.06    0.04    0.02    0.01    0.00   -0.01   -0.19   -0.17
PRICE.LEVEL.GDP_PCER        0.36    0.80    1.09    1.26    1.34    1.36    1.34    1.28    1.19    1.07   -0.16   -0.39
.PRICE.LEVEL.T_PCER         0.20    0.48    0.69    0.81    0.88    0.91    0.91    0.88    0.84    0.78   -0.03   -0.23
.PRICE.LEVEL.NT_PCER        0.35    0.77    1.04    1.19    1.26    1.28    1.25    1.19    1.11    1.00   -0.13   -0.33
.PRICE.LEVEL.HOUSE_PCER    10.60   14.06   14.35   14.41   14.44   14.45   14.46   14.46   14.45   14.44   14.22   14.13
EXPORT.PRICES_PCER          0.20    0.48    0.69    0.81    0.88    0.91    0.91    0.88    0.84    0.78   -0.03   -0.23
IMPORT.PRICES_PCER         -0.09   -0.12   -0.14   -0.14   -0.12   -0.09   -0.05   -0.01    0.03    0.08    0.30    0.21
TOT_PCER                    0.28    0.60    0.82    0.95    1.00    1.00    0.96    0.90    0.81    0.70   -0.32   -0.44
REER_PCER                  -0.44   -0.92   -1.23   -1.39   -1.46   -1.45   -1.38   -1.28   -1.15   -0.98    0.47    0.60
EXR_PCER                   -0.13   -0.15   -0.16   -0.16   -0.14   -0.11   -0.07   -0.03    0.01    0.06    0.28    0.19
```

Data Set by Archive - Error

        TEMP_SIM_ER

```
                           2011A   2012A   2013A   2014A   2015A   2016A   2017A   2018A   2019A   2020A   2030A   2040A

NOM.INT.RATE_ER            -0.02   -0.01    0.00    0.01    0.03    0.04    0.04    0.05    0.05    0.05   -0.00   -0.01
REAL.INT.RATE_ER           -0.52   -0.35   -0.21   -0.09   -0.01    0.05    0.09    0.13    0.16    0.18    0.06   -0.01
INFL.GDP_ER                 0.55    0.38    0.24    0.13    0.05   -0.00   -0.04   -0.07   -0.10   -0.13   -0.06    0.00
INFL.PC_ER                  0.46    0.31    0.19    0.11    0.04    0.00   -0.03   -0.05   -0.08   -0.10   -0.05   -0.00
LABOUR.TAX.RATE_ER         -0.07   -0.23   -0.34   -0.39   -0.40   -0.39   -0.35   -0.31   -0.25   -0.19    0.26    0.20
GOV.DEBT.GDP_ER            -0.38   -0.82   -0.99   -1.00   -0.90   -0.73   -0.54   -0.34   -0.14    0.06    0.75    0.12
GOV.BALANCE.GDP_ER          0.17    0.16    0.06   -0.03   -0.08   -0.11   -0.12   -0.12   -0.11   -0.10    0.04    0.04
GOV.EXP.GDP_ER             -0.37   -0.57   -0.58   -0.54   -0.49   -0.43   -0.37   -0.30   -0.22   -0.14    0.22    0.17
GOV.REV.GDP_ER             -0.22   -0.45   -0.57   -0.61   -0.61   -0.56   -0.49   -0.41   -0.32   -0.22    0.30    0.21
TRADE.BAL.GDP_ER           -0.16   -0.25   -0.27   -0.26   -0.24   -0.22   -0.19   -0.17   -0.14   -0.10    0.16    0.16
CURRENT.ACC.GDP_ER         -0.16   -0.27   -0.30   -0.31   -0.30   -0.29   -0.28   -0.26   -0.24   -0.22    0.02    0.06
NFA.GDP_ER                 -0.09   -0.32   -0.60   -0.90   -1.18   -1.46   -1.72   -1.96   -2.17   -2.37   -2.77   -1.86
```

Increased price and wage flexibility and prudent valuation of housing collateral:

Small EMU member

Data Set by Archive - Percent Error

        TEMP_SIM_PCER

```
                           2011A   2012A   2013A   2014A   2015A   2016A   2017A   2018A   2019A   2020A   2030A   2040A

GDP.REAL_PCER               0.51    0.74    0.73    0.68    0.61    0.53    0.43    0.32    0.21    0.09   -0.38   -0.28
OUTPUT.T_PCER              -0.06   -0.29   -0.52   -0.68   -0.77   -0.81   -0.81   -0.79   -0.75   -0.68    0.04    0.19
OUTPUT.NT_PCER              0.93    1.44    1.57    1.57    1.51    1.40    1.24    1.06    0.85    0.61   -0.66   -0.59
CAPITAL.T_PCER              0.00    0.00   -0.03   -0.07   -0.14   -0.21   -0.28   -0.35   -0.42   -0.49   -0.59   -0.29
CAPITAL.NT_PCER             0.02    0.05    0.08    0.09    0.08    0.04   -0.01   -0.08   -0.15   -0.23   -0.76   -0.69
EMPLOYMENT_PCER             0.60    0.93    0.96    0.93    0.87    0.78    0.68    0.57    0.44    0.31   -0.25   -0.18
.EMPLOYMENT.T_PCER          0.47    0.69    0.67    0.62    0.56    0.49    0.40    0.32    0.23    0.13   -0.15   -0.08
.EMPLOYMENT.NT_PCER         0.79    1.29    1.39    1.39    1.34    1.24    1.10    0.95    0.77    0.57   -0.39   -0.33
DEMAND.DOM_PCER             0.67    0.99    0.99    0.94    0.85    0.74    0.62    0.49    0.34    0.19   -0.53   -0.43
CONSUMPTION_PCER           -1.28   -2.29   -2.75   -2.90   -2.81   -2.56   -2.20   -1.78   -1.34   -0.87    0.72    0.42
.CLC_PCER                   0.23    0.58    0.72    0.75    0.73    0.69    0.62    0.54    0.44    0.32   -0.51   -0.43
.CCC_PCER                  -5.80   -9.96  -11.53  -11.85  -11.32  -10.12   -8.57   -6.84   -5.01   -3.14    1.96    0.26
.CNLC_PCER                 -0.00   -0.27   -0.53   -0.69   -0.76   -0.77   -0.74   -0.67   -0.58   -0.45    0.80    0.94
INVESTMENT.CAPITAL_PCER     0.49    0.54    0.18   -0.28   -0.72   -1.10   -1.42   -1.66   -1.83   -1.92   -0.78   -0.09
.INVESTMENT.T_PCER          0.09   -0.14   -0.49   -0.77   -0.98   -1.13   -1.23   -1.28   -1.29   -1.26    0.08
.INVESTMENT.NT_PCER         0.79    1.06    0.68    0.09   -0.52   -1.08   -1.56   -1.95   -2.24   -2.42   -1.16   -0.22
INVESTMENT.HOUSE_PCER      28.37   49.09   57.47   60.17   58.83   54.32   47.80   39.96   31.09   21.44  -24.33  -21.07
```

	2011A	2012A	2013A	2014A	2015A	2016A	2017A	2018A	2019A	2020A	2030A	2040A
GOVERNMENT.PURCHASES_PCER	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EXPORTS_PCER	-0.36	-0.68	-0.86	-0.95	-0.98	-0.97	-0.93	-0.87	-0.78	-0.68	0.30	0.41
IMPORTS_PCER	0.53	0.86	0.93	0.91	0.85	0.78	0.70	0.60	0.50	0.38	-0.54	-0.55
REAL.WAGE_PCER	-0.04	0.03	0.04	0.01	-0.00	-0.01	-0.01	-0.01	-0.01	-0.02	-0.18	-0.17
PRICE.LEVEL.GDP_PCER	0.43	0.90	1.17	1.32	1.38	1.38	1.36	1.30	1.20	1.08	-0.16	-0.38
.PRICE.LEVEL.T_PCER	0.23	0.55	0.75	0.86	0.91	0.93	0.93	0.90	0.86	0.79	-0.03	-0.23
.PRICE.LEVEL.NT_PCER	0.42	0.87	1.11	1.24	1.29	1.30	1.27	1.21	1.13	1.01	-0.13	-0.33
.PRICE.LEVEL.HOUSE_PCER	10.62	14.08	14.37	14.43	14.45	14.46	14.47	14.47	14.46	14.45	14.22	14.13
EXPORT.PRICES_PCER	0.23	0.55	0.75	0.86	0.91	0.93	0.93	0.90	0.86	0.79	-0.03	-0.23
IMPORT.PRICES_PCER	-0.09	-0.12	-0.13	-0.13	-0.11	-0.08	-0.05	-0.00	0.04	0.09	0.30	0.20
TOT_PCER	0.32	0.67	0.88	0.98	1.02	1.01	0.97	0.91	0.82	0.70	-0.32	-0.43
REER_PCER	-0.51	-1.02	-1.30	-1.44	-1.48	-1.46	-1.39	-1.29	-1.16	-0.99	0.46	0.59
EXR_PCER	-0.13	-0.15	-0.15	-0.15	-0.13	-0.10	-0.07	-0.02	0.02	0.07	0.28	0.19

Data Set by Archive - Error

TEMP_SIM_ER

	2011A	2012A	2013A	2014A	2015A	2016A	2017A	2018A	2019A	2020A	2030A	2040A
NOM.INT.RATE_ER	-0.01	-0.01	0.00	0.02	0.03	0.04	0.04	0.05	0.05	0.05	-0.00	-0.01
REAL.INT.RATE_ER	-0.59	-0.34	-0.18	-0.07	0.00	0.05	0.09	0.13	0.16	0.18	0.06	-0.01
INFL.GDP_ER	0.64	0.38	0.21	0.10	0.04	-0.01	-0.04	-0.07	-0.10	-0.13	-0.06	0.00
INFL.PC_ER	0.54	0.31	0.17	0.08	0.03	-0.00	-0.03	-0.05	-0.08	-0.10	-0.05	-0.00
LABOUR.TAX.RATE_ER	-0.08	-0.23	-0.31	-0.35	-0.35	-0.34	-0.31	-0.26	-0.22	-0.16	0.25	0.19
GOV.DEBT.GDP_ER	-0.37	-0.78	-0.91	-0.89	-0.79	-0.64	-0.47	-0.29	-0.10	0.09	0.69	0.10
GOV.BALANCE.GDP_ER	0.15	0.12	0.03	-0.04	-0.08	-0.10	-0.10	-0.10	-0.10	-0.09	0.04	0.04
GOV.EXP.GDP_ER	-0.35	-0.53	-0.54	-0.51	-0.48	-0.42	-0.36	-0.29	-0.21	-0.13	0.21	0.17
GOV.REV.GDP_ER	-0.23	-0.45	-0.55	-0.59	-0.58	-0.53	-0.47	-0.39	-0.30	-0.20	0.29	0.21
TRADE.BAL.GDP_ER	-0.16	-0.25	-0.26	-0.25	-0.23	-0.21	-0.19	-0.16	-0.13	-0.10	0.15	0.15
CURRENT.ACC.GDP_ER	-0.16	-0.26	-0.29	-0.29	-0.29	-0.28	-0.27	-0.26	-0.24	-0.22	0.02	0.06
NFA.GDP_ER	-0.09	-0.32	-0.59	-0.87	-1.15	-1.41	-1.66	-1.90	-2.11	-2.30	-2.71	-1.82

Figure 3.2: Impulse responses for 1-percent domestic demand shock

Baseline calibration of adjustment frictions:

Small EMU member

Data Set by Archive - Percent Error

TEMP_SIM_PCER

	2011A	2012A	2013A	2014A	2015A	2016A	2017A	2018A	2019A	2020A	2030A	2040A
GDP.REAL_PCER	0.55	0.69	0.54	0.34	0.22	0.16	0.13	0.11	0.10	0.08	-0.02	-0.05
OUTPUT.T_PCER	0.45	0.46	0.25	0.07	-0.02	-0.04	-0.02	0.00	0.03	0.05	0.08	0.07
OUTPUT.NT_PCER	0.82	1.07	0.92	0.65	0.45	0.31	0.23	0.17	0.13	0.09	-0.12	-0.16
CAPITAL.T_PCER	0.06	0.18	0.29	0.35	0.38	0.39	0.39	0.38	0.37	0.36	0.19	0.07
CAPITAL.NT_PCER	0.02	0.08	0.12	0.15	0.16	0.15	0.14	0.13	0.11	0.09	-0.07	-0.17
EMPLOYMENT_PCER	0.53	0.66	0.50	0.31	0.18	0.12	0.09	0.08	0.06	0.05	-0.03	-0.03
.EMPLOYMENT.T_PCER	0.47	0.57	0.40	0.21	0.11	0.06	0.05	0.05	0.04	0.04	-0.00	-0.01
.EMPLOYMENT.NT_PCER	0.61	0.81	0.66	0.45	0.30	0.21	0.16	0.12	0.09	0.07	-0.06	-0.08
DEMAND.DOM_PCER	0.90	1.20	1.02	0.72	0.50	0.35	0.26	0.19	0.14	0.09	-0.13	-0.18
CONSUMPTION_PCER	1.37	1.96	1.82	1.43	1.07	0.81	0.60	0.45	0.32	0.21	-0.28	-0.36
.CLC_PCER	1.26	1.79	1.83	1.60	1.33	1.08	0.87	0.70	0.55	0.43	-0.20	-0.27
.CCC_PCER	1.02	1.36	1.13	0.83	0.60	0.45	0.35	0.28	0.22	0.17	-0.18	-0.26
.CNLC_PCER	1.59	2.32	2.14	1.61	1.16	0.83	0.59	0.40	0.25	0.12	-0.36	-0.45
INVESTMENT.CAPITAL_PCER	1.26	1.67	1.26	0.77	0.40	0.17	0.04	-0.04	-0.10	-0.14	-0.25	-0.22
.INVESTMENT.T_PCER	1.39	1.78	1.38	0.94	0.64	0.46	0.35	0.28	0.23	0.18	-0.00	-0.04
.INVESTMENT.NT_PCER	1.16	1.58	1.17	0.63	0.22	-0.04	-0.20	-0.29	-0.35	-0.38	-0.43	-0.36
INVESTMENT.HOUSE_PCER	-0.20	-0.55	-0.76	-0.81	-0.77	-0.66	-0.53	-0.42	-0.32	-0.25	-0.18	-0.20
GOVERNMENT.PURCHASES_PCER	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EXPORTS_PCER	-0.33	-0.62	-0.71	-0.65	-0.52	-0.38	-0.25	-0.14	-0.05	0.02	0.27	0.27
IMPORTS_PCER	1.21	1.79	1.71	1.35	0.99	0.69	0.46	0.28	0.14	0.03	-0.41	-0.44
REAL.WAGE_PCER	0.21	0.41	0.38	0.26	0.13	0.06	0.02	0.00	0.00	-0.00	-0.03	-0.05
PRICE.LEVEL.GDP_PCER	0.42	0.87	1.04	1.00	0.85	0.68	0.52	0.38	0.27	0.18	-0.19	-0.25
.PRICE.LEVEL.T_PCER	0.27	0.60	0.73	0.72	0.63	0.51	0.40	0.31	0.23	0.16	-0.11	-0.17
.PRICE.LEVEL.NT_PCER	0.40	0.81	0.97	0.93	0.80	0.64	0.49	0.37	0.27	0.19	-0.14	-0.21
.PRICE.LEVEL.HOUSE_PCER	-0.19	-0.12	-0.05	-0.04	-0.08	-0.12	-0.17	-0.21	-0.24	-0.27	-0.39	-0.43
EXPORT.PRICES_PCER	0.27	0.60	0.73	0.72	0.63	0.51	0.40	0.31	0.23	0.16	-0.11	-0.17
IMPORT.PRICES_PCER	-0.05	-0.03	0.00	0.04	0.08	0.11	0.14	0.16	0.17	0.18	0.18	0.12
TOT_PCER	0.31	0.62	0.73	0.68	0.55	0.40	0.26	0.15	0.05	-0.02	-0.28	-0.29
REER_PCER	-0.46	-0.90	-1.03	-0.95	-0.77	-0.57	-0.38	-0.22	-0.10	0.01	0.37	0.38
EXR_PCER	-0.09	-0.07	-0.02	0.02	0.06	0.09	0.12	0.14	0.15	0.16	0.16	0.11

Data Set by Archive - Error

TEMP_SIM_ER

	2011A	2012A	2013A	2014A	2015A	2016A	2017A	2018A	2019A	2020A	2030A	2040A
NOM.INT.RATE_ER	0.02	0.05	0.05	0.05	0.04	0.03	0.02	0.02	0.01	0.01	-0.00	-0.00
REAL.INT.RATE_ER	-0.54	-0.22	0.03	0.17	0.21	0.20	0.17	0.14	0.11	0.09	0.01	-0.00
INFL.GDP_ER	0.63	0.34	0.07	-0.09	-0.16	-0.17	-0.15	-0.13	-0.10	-0.08	-0.01	-0.00
INFL.PC_ER	0.53	0.28	0.06	-0.07	-0.13	-0.14	-0.12	-0.10	-0.08	-0.07	-0.01	-0.00
LABOUR.TAX.RATE_ER	-0.13	-0.40	-0.56	-0.60	-0.58	-0.51	-0.44	-0.36	-0.30	-0.23	0.13	0.16
GOV.DEBT.GDP_ER	-0.53	-1.14	-1.36	-1.27	-1.04	-0.77	-0.51	-0.28	-0.08	0.08	0.57	0.24
GOV.BALANCE.GDP_ER	0.39	0.38	0.17	-0.02	-0.12	-0.16	-0.16	-0.15	-0.13	-0.12	0.01	0.02
GOV.EXP.GDP_ER	-0.37	-0.46	-0.36	-0.23	-0.15	-0.10	-0.07	-0.06	-0.05	-0.03	0.03	0.05
GOV.REV.GDP_ER	0.01	-0.11	-0.23	-0.29	-0.30	-0.28	-0.25	-0.21	-0.18	-0.14	0.06	0.08
TRADE.BAL.GDP_ER	-0.35	-0.51	-0.48	-0.38	-0.28	-0.19	-0.13	-0.08	-0.04	-0.01	0.11	0.12

```
CURRENT.ACC.GDP_ER       -0.36   -0.54   -0.54   -0.46   -0.38   -0.31   -0.26   -0.22   -0.19   -0.16   -0.06   -0.05
NFA.GDP_ER               -0.19   -0.68   -1.21   -1.68   -2.06   -2.37   -2.61   -2.80   -2.95   -3.08   -3.47   -3.40
```

3-quarter average price duration:

Small EMU member

Data Set by Archive - Percent Error

TEMP_SIM_PCER

	2011A	2012A	2013A	2014A	2015A	2016A	2017A	2018A	2019A	2020A	2030A	2040A
GDP.REAL_PCER	0.51	0.61	0.47	0.31	0.21	0.16	0.14	0.12	0.10	0.09	-0.02	-0.05
OUTPUT.T_PCER	0.37	0.33	0.15	0.02	-0.03	-0.03	-0.00	0.02	0.04	0.05	0.08	0.07
OUTPUT.NT_PCER	0.76	0.95	0.81	0.59	0.43	0.32	0.24	0.19	0.14	0.10	-0.12	-0.16
CAPITAL.T_PCER	0.06	0.18	0.27	0.33	0.36	0.37	0.38	0.37	0.37	0.35	0.19	0.07
CAPITAL.NT_PCER	0.02	0.07	0.11	0.14	0.15	0.15	0.14	0.12	0.11	0.09	-0.07	-0.16
EMPLOYMENT_PCER	0.50	0.61	0.46	0.29	0.18	0.13	0.10	0.08	0.07	0.05	-0.03	-0.03
.EMPLOYMENT.T_PCER	0.44	0.51	0.35	0.20	0.11	0.07	0.06	0.05	0.05	0.04	-0.00	-0.01
.EMPLOYMENT.NT_PCER	0.58	0.75	0.61	0.42	0.29	0.22	0.17	0.13	0.10	0.07	-0.06	-0.07
DEMAND.DOM_PCER	0.85	1.10	0.93	0.68	0.48	0.36	0.27	0.21	0.15	0.10	-0.13	-0.17
CONSUMPTION_PCER	1.33	1.85	1.72	1.37	1.05	0.80	0.61	0.46	0.33	0.22	-0.27	-0.35
.CLC_PCER	1.16	1.62	1.66	1.47	1.25	1.04	0.86	0.70	0.56	0.43	-0.19	-0.27
.CCC_PCER	1.01	1.20	0.95	0.70	0.52	0.41	0.34	0.28	0.22	0.17	-0.17	-0.25
.CNLC_PCER	1.57	2.27	2.11	1.61	1.18	0.85	0.61	0.41	0.26	0.13	-0.36	-0.44
INVESTMENT.CAPITAL_PCER	1.18	1.55	1.17	0.74	0.42	0.22	0.09	-0.00	-0.06	-0.11	-0.24	-0.22
.INVESTMENT.T_PCER	1.32	1.68	1.31	0.92	0.65	0.49	0.38	0.30	0.24	0.19	-0.00	-0.04
.INVESTMENT.NT_PCER	1.08	1.45	1.07	0.60	0.25	0.01	-0.14	-0.23	-0.30	-0.35	-0.42	-0.35
INVESTMENT.HOUSE_PCER	-0.25	-0.71	-0.92	-0.92	-0.81	-0.65	-0.50	-0.38	-0.28	-0.21	-0.15	-0.19
GOVERNMENT.PURCHASES_PCER	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EXPORTS_PCER	-0.38	-0.68	-0.74	-0.65	-0.52	-0.37	-0.25	-0.14	-0.06	0.01	0.26	0.27
IMPORTS_PCER	1.18	1.72	1.63	1.30	0.97	0.69	0.47	0.30	0.16	0.05	-0.40	-0.43
REAL.WAGE_PCER	0.09	0.22	0.21	0.15	0.10	0.06	0.04	0.03	0.02	0.02	-0.03	-0.05
PRICE.LEVEL.GDP_PCER	0.49	0.95	1.08	1.01	0.84	0.67	0.51	0.38	0.27	0.18	-0.19	-0.25
.PRICE.LEVEL.T_PCER	0.31	0.66	0.77	0.73	0.63	0.51	0.40	0.30	0.23	0.16	-0.11	-0.17
.PRICE.LEVEL.NT_PCER	0.46	0.88	1.00	0.93	0.78	0.63	0.49	0.37	0.27	0.19	-0.14	-0.21
.PRICE.LEVEL.HOUSE_PCER	-0.17	-0.09	-0.03	-0.04	-0.08	-0.13	-0.17	-0.21	-0.24	-0.27	-0.39	-0.44
EXPORT.PRICES_PCER	0.31	0.66	0.77	0.73	0.63	0.51	0.40	0.30	0.23	0.16	-0.11	-0.17
IMPORT.PRICES_PCER	-0.05	-0.02	0.01	0.05	0.08	0.12	0.14	0.16	0.17	0.18	0.17	0.12
TOT_PCER	0.36	0.68	0.76	0.68	0.54	0.39	0.26	0.15	0.06	-0.02	-0.28	-0.28
REER_PCER	-0.53	-0.97	-1.07	-0.95	-0.76	-0.55	-0.37	-0.22	-0.10	0.00	0.36	0.37
EXR_PCER	-0.09	-0.06	-0.02	0.03	0.07	0.10	0.12	0.14	0.15	0.16	0.15	0.10

Data Set by Archive - Error

TEMP_SIM_ER

	2011A	2012A	2013A	2014A	2015A	2016A	2017A	2018A	2019A	2020A	2030A	2040A
NOM.INT.RATE_ER	0.03	0.05	0.05	0.04	0.04	0.03	0.02	0.02	0.01	0.01	-0.00	-0.00
REAL.INT.RATE_ER	-0.58	-0.19	0.07	0.19	0.21	0.19	0.16	0.13	0.11	0.09	0.01	-0.00
INFL.GDP_ER	0.72	0.32	0.03	-0.12	-0.17	-0.17	-0.15	-0.12	-0.10	-0.08	-0.01	-0.00
INFL.PC_ER	0.60	0.27	0.03	-0.10	-0.14	-0.13	-0.12	-0.10	-0.08	-0.07	-0.01	-0.00
LABOUR.TAX.RATE_ER	-0.13	-0.38	-0.52	-0.56	-0.53	-0.48	-0.41	-0.35	-0.28	-0.23	0.12	0.16
GOV.DEBT.GDP_ER	-0.51	-1.08	-1.26	-1.17	-0.96	-0.72	-0.49	-0.28	-0.10	0.06	0.54	0.24
GOV.BALANCE.GDP_ER	0.37	0.34	0.15	-0.01	-0.10	-0.13	-0.14	-0.13	-0.12	-0.11	0.00	0.02
GOV.EXP.GDP_ER	-0.35	-0.42	-0.33	-0.22	-0.15	-0.11	-0.08	-0.06	-0.05	-0.04	0.03	0.04
GOV.REV.GDP_ER	0.01	-0.11	-0.21	-0.26	-0.27	-0.26	-0.23	-0.20	-0.17	-0.14	0.06	0.08
TRADE.BAL.GDP_ER	-0.34	-0.49	-0.46	-0.36	-0.27	-0.19	-0.13	-0.09	-0.05	-0.02	0.11	0.12
CURRENT.ACC.GDP_ER	-0.35	-0.52	-0.51	-0.44	-0.37	-0.31	-0.26	-0.22	-0.19	-0.16	-0.06	-0.05
NFA.GDP_ER	-0.19	-0.66	-1.17	-1.62	-1.99	-2.28	-2.52	-2.72	-2.87	-3.00	-3.41	-3.34

3-quarter average wage duration:

Small EMU member

Data Set by Archive - Percent Error

TEMP_SIM_PCER

	2011A	2012A	2013A	2014A	2015A	2016A	2017A	2018A	2019A	2020A	2030A	2040A
GDP.REAL_PCER	0.54	0.64	0.47	0.29	0.19	0.15	0.13	0.12	0.10	0.09	-0.02	-0.06
OUTPUT.T_PCER	0.44	0.41	0.19	0.01	-0.05	-0.04	-0.01	0.02	0.04	0.06	0.08	0.07
OUTPUT.NT_PCER	0.85	1.07	0.88	0.60	0.40	0.29	0.22	0.17	0.13	0.09	-0.12	-0.17
CAPITAL.T_PCER	0.06	0.18	0.27	0.33	0.36	0.37	0.37	0.37	0.36	0.35	0.19	0.07
CAPITAL.NT_PCER	0.02	0.07	0.11	0.14	0.14	0.14	0.13	0.11	0.10	0.08	-0.08	-0.17
EMPLOYMENT_PCER	0.50	0.60	0.43	0.26	0.16	0.12	0.10	0.09	0.07	0.06	-0.02	-0.03
.EMPLOYMENT.T_PCER	0.44	0.49	0.32	0.16	0.09	0.07	0.06	0.06	0.05	0.05	-0.00	-0.00
.EMPLOYMENT.NT_PCER	0.59	0.76	0.60	0.40	0.27	0.20	0.16	0.13	0.10	0.07	-0.06	-0.08
DEMAND.DOM_PCER	0.91	1.17	0.96	0.66	0.46	0.33	0.25	0.19	0.14	0.10	-0.13	-0.18
CONSUMPTION_PCER	1.41	1.97	1.79	1.37	1.02	0.77	0.59	0.44	0.32	0.21	-0.28	-0.36
.CLC_PCER	1.35	1.90	1.86	1.56	1.25	1.00	0.81	0.66	0.53	0.41	-0.20	-0.27
.CCC_PCER	1.15	1.44	1.11	0.75	0.51	0.39	0.31	0.26	0.21	0.16	-0.18	-0.26
.CNLC_PCER	1.56	2.24	2.06	1.56	1.14	0.83	0.60	0.41	0.26	0.13	-0.37	-0.46
INVESTMENT.CAPITAL_PCER	1.21	1.55	1.13	0.67	0.36	0.17	0.06	-0.02	-0.08	-0.12	-0.24	-0.22
.INVESTMENT.T_PCER	1.35	1.69	1.28	0.87	0.61	0.46	0.36	0.30	0.24	0.19	-0.01	-0.04
.INVESTMENT.NT_PCER	1.10	1.44	1.02	0.52	0.17	-0.05	-0.18	-0.26	-0.31	-0.36	-0.43	-0.36
INVESTMENT.HOUSE_PCER	-0.09	-0.48	-0.80	-0.91	-0.86	-0.72	-0.57	-0.43	-0.33	-0.25	-0.18	-0.21
GOVERNMENT.PURCHASES_PCER	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EXPORTS_PCER	-0.37	-0.69	-0.76	-0.68	-0.52	-0.37	-0.24	-0.13	-0.05	0.02	0.27	0.27

```
IMPORTS_PCER                1.27   1.87   1.73   1.33   0.95   0.66   0.44   0.27   0.14   0.03  -0.41  -0.44
REAL.WAGE_PCER              0.33   0.57   0.46   0.25   0.10   0.02  -0.00  -0.01  -0.00  -0.00  -0.03  -0.05
PRICE.LEVEL.GDP_PCER        0.48   0.98   1.13   1.05   0.86   0.67   0.50   0.37   0.26   0.17  -0.19  -0.26
.PRICE.LEVEL.T_PCER         0.31   0.67   0.80   0.76   0.64   0.51   0.39   0.30   0.22   0.16  -0.11  -0.17
.PRICE.LEVEL.NT_PCER        0.45   0.92   1.05   0.97   0.80   0.63   0.48   0.36   0.26   0.19  -0.15  -0.21
.PRICE.LEVEL.HOUSE_PCER    -0.17  -0.08  -0.02  -0.02  -0.07  -0.12  -0.17  -0.21  -0.24  -0.27  -0.39  -0.44
EXPORT.PRICES_PCER          0.31   0.67   0.80   0.76   0.64   0.51   0.39   0.30   0.22   0.16  -0.11  -0.17
IMPORT.PRICES_PCER         -0.05  -0.02   0.01   0.06   0.09   0.12   0.15   0.17   0.18   0.19   0.18   0.12
TOT_PCER                    0.36   0.70   0.79   0.71   0.55   0.39   0.25   0.13   0.04  -0.03  -0.28  -0.29
REER_PCER                  -0.52  -1.00  -1.12  -0.99  -0.77  -0.55  -0.36  -0.20  -0.08   0.01   0.37   0.38
EXR_PCER                   -0.10  -0.06  -0.01   0.03   0.07   0.10   0.13   0.14   0.16   0.17   0.16   0.10
```

Data Set by Archive - Error

TEMP_SIM_ER

	2011A	2012A	2013A	2014A	2015A	2016A	2017A	2018A	2019A	2020A	2030A	2040A
NOM.INT.RATE_ER	0.03	0.06	0.06	0.05	0.04	0.03	0.02	0.02	0.01	0.01	-0.00	-0.00
REAL.INT.RATE_ER	-0.61	-0.22	0.08	0.21	0.23	0.21	0.17	0.13	0.11	0.08	0.01	-0.00
INFL.GDP_ER	0.72	0.36	0.04	-0.14	-0.19	-0.19	-0.15	-0.12	-0.10	-0.08	-0.01	-0.00
INFL.PC_ER	0.60	0.30	0.04	-0.11	-0.16	-0.15	-0.12	-0.10	-0.08	-0.06	-0.01	-0.00
LABOUR.TAX.RATE_ER	-0.14	-0.40	-0.54	-0.57	-0.53	-0.47	-0.40	-0.34	-0.28	-0.22	0.13	0.16
GOV.DEBT.GDP_ER	-0.53	-1.13	-1.30	-1.18	-0.94	-0.69	-0.46	-0.25	-0.08	0.07	0.54	0.24
GOV.BALANCE.GDP_ER	0.39	0.35	0.14	-0.03	-0.11	-0.14	-0.14	-0.13	-0.12	-0.11	0.00	0.02
GOV.EXP.GDP_ER	-0.35	-0.42	-0.32	-0.20	-0.13	-0.10	-0.08	-0.06	-0.05	-0.04	0.03	0.05
GOV.REV.GDP_ER	0.02	-0.10	-0.21	-0.27	-0.28	-0.26	-0.23	-0.20	-0.17	-0.14	0.06	0.08
TRADE.BAL.GDP_ER	-0.37	-0.53	-0.49	-0.37	-0.27	-0.18	-0.12	-0.08	-0.04	-0.01	0.11	0.12
CURRENT.ACC.GDP_ER	-0.38	-0.56	-0.54	-0.45	-0.37	-0.30	-0.25	-0.22	-0.19	-0.16	-0.06	-0.05
NFA.GDP_ER	-0.20	-0.71	-1.26	-1.73	-2.10	-2.39	-2.62	-2.81	-2.96	-3.09	-3.49	-3.42

Prudent valuation of housing collateral:

Small EMU member

Data Set by Archive - Percent Error

TEMP_SIM_PCER

	2011A	2012A	2013A	2014A	2015A	2016A	2017A	2018A	2019A	2020A	2030A	2040A
GDP.REAL_PCER	0.56	0.69	0.54	0.35	0.22	0.16	0.13	0.11	0.10	0.08	-0.02	-0.06
OUTPUT.T_PCER	0.45	0.46	0.25	0.06	-0.03	-0.05	-0.03	0.00	0.03	0.05	0.09	0.07
OUTPUT.NT_PCER	0.83	1.09	0.93	0.66	0.45	0.32	0.23	0.17	0.13	0.09	-0.13	-0.17
CAPITAL.T_PCER	0.06	0.18	0.29	0.34	0.37	0.38	0.38	0.38	0.37	0.35	0.19	0.07
CAPITAL.NT_PCER	0.02	0.08	0.12	0.15	0.16	0.15	0.14	0.12	0.11	0.09	-0.08	-0.17
EMPLOYMENT_PCER	0.53	0.67	0.51	0.31	0.19	0.12	0.09	0.08	0.06	0.05	-0.03	-0.03
.EMPLOYMENT.T_PCER	0.48	0.57	0.40	0.22	0.11	0.06	0.05	0.05	0.04	0.04	-0.00	-0.00
.EMPLOYMENT.NT_PCER	0.62	0.82	0.67	0.46	0.30	0.21	0.16	0.12	0.09	0.07	-0.06	-0.08
DEMAND.DOM_PCER	0.91	1.21	1.03	0.73	0.50	0.35	0.26	0.19	0.14	0.09	-0.14	-0.18
CONSUMPTION_PCER	1.38	1.97	1.83	1.44	1.08	0.81	0.61	0.45	0.32	0.21	-0.28	-0.36
.CLC_PCER	1.26	1.80	1.85	1.62	1.34	1.08	0.87	0.70	0.55	0.42	-0.21	-0.27
.CCC_PCER	1.06	1.40	1.17	0.86	0.62	0.45	0.35	0.27	0.21	0.15	-0.22	-0.29
.CNLC_PCER	1.59	2.31	2.13	1.61	1.16	0.83	0.59	0.40	0.25	0.13	-0.35	-0.44
INVESTMENT.CAPITAL_PCER	1.26	1.66	1.24	0.75	0.38	0.15	0.02	-0.06	-0.11	-0.15	-0.24	-0.22
.INVESTMENT.T_PCER	1.38	1.77	1.36	0.92	0.63	0.45	0.34	0.27	0.22	0.18	-0.00	-0.04
.INVESTMENT.NT_PCER	1.16	1.57	1.15	0.61	0.20	-0.07	-0.22	-0.31	-0.36	-0.40	-0.43	-0.35
INVESTMENT.HOUSE_PCER	-0.08	-0.36	-0.57	-0.66	-0.65	-0.58	-0.49	-0.40	-0.32	-0.27	-0.23	-0.23
GOVERNMENT.PURCHASES_PCER	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EXPORTS_PCER	-0.34	-0.63	-0.72	-0.66	-0.53	-0.39	-0.26	-0.14	-0.06	0.02	0.27	0.28
IMPORTS_PCER	1.22	1.81	1.73	1.37	1.00	0.70	0.46	0.28	0.14	0.03	-0.41	-0.44
REAL.WAGE_PCER	0.21	0.42	0.39	0.26	0.14	0.06	0.02	0.00	-0.00	-0.00	-0.03	-0.05
PRICE.LEVEL.GDP_PCER	0.43	0.88	1.06	1.01	0.87	0.69	0.53	0.39	0.27	0.18	-0.19	-0.26
.PRICE.LEVEL.T_PCER	0.27	0.60	0.74	0.73	0.64	0.52	0.41	0.31	0.23	0.16	-0.11	-0.17
.PRICE.LEVEL.NT_PCER	0.40	0.83	0.98	0.94	0.81	0.65	0.50	0.38	0.27	0.19	-0.15	-0.21
.PRICE.LEVEL.HOUSE_PCER	-0.16	-0.08	-0.01	-0.01	-0.04	-0.09	-0.14	-0.18	-0.21	-0.24	-0.36	-0.40
EXPORT.PRICES_PCER	0.27	0.60	0.74	0.73	0.64	0.52	0.41	0.31	0.23	0.16	-0.11	-0.17
IMPORT.PRICES_PCER	-0.05	-0.03	0.00	0.04	0.08	0.11	0.14	0.16	0.17	0.19	0.18	0.12
TOT_PCER	0.32	0.63	0.74	0.69	0.56	0.41	0.27	0.15	0.05	-0.02	-0.29	-0.29
REER_PCER	-0.47	-0.91	-1.05	-0.97	-0.79	-0.58	-0.39	-0.23	-0.10	0.01	0.38	0.38
EXR_PCER	-0.09	-0.07	-0.03	0.02	0.06	0.09	0.12	0.14	0.15	0.16	0.16	0.11

Data Set by Archive - Error

TEMP_SIM_ER

	2011A	2012A	2013A	2014A	2015A	2016A	2017A	2018A	2019A	2020A	2030A	2040A
NOM.INT.RATE_ER	0.02	0.05	0.05	0.05	0.04	0.03	0.02	0.02	0.01	0.01	-0.00	-0.00
REAL.INT.RATE_ER	-0.55	-0.22	0.03	0.17	0.21	0.20	0.17	0.14	0.11	0.09	0.01	-0.00
INFL.GDP_ER	0.64	0.34	0.07	-0.10	-0.17	-0.17	-0.16	-0.13	-0.10	-0.08	-0.01	-0.00
INFL.PC_ER	0.53	0.29	0.06	-0.07	-0.13	-0.14	-0.12	-0.10	-0.08	-0.07	-0.01	-0.00
LABOUR.TAX.RATE_ER	-0.13	-0.40	-0.56	-0.61	-0.58	-0.52	-0.44	-0.37	-0.30	-0.23	0.13	0.16
GOV.DEBT.GDP_ER	-0.53	-1.16	-1.38	-1.28	-1.05	-0.77	-0.51	-0.28	-0.08	0.09	0.57	0.24
GOV.BALANCE.GDP_ER	0.40	0.38	0.18	-0.02	-0.12	-0.16	-0.16	-0.15	-0.13	-0.12	0.01	0.02
GOV.EXP.GDP_ER	-0.37	-0.47	-0.37	-0.23	-0.15	-0.10	-0.07	-0.06	-0.04	-0.03	0.03	0.05
GOV.REV.GDP_ER	0.01	-0.11	-0.23	-0.29	-0.30	-0.28	-0.25	-0.21	-0.18	-0.14	0.06	0.08
TRADE.BAL.GDP_ER	-0.36	-0.52	-0.49	-0.38	-0.28	-0.19	-0.13	-0.08	-0.04	-0.01	0.11	0.12
CURRENT.ACC.GDP_ER	-0.36	-0.54	-0.54	-0.46	-0.38	-0.31	-0.26	-0.22	-0.19	-0.16	-0.06	-0.05
NFA.GDP_ER	-0.20	-0.69	-1.23	-1.70	-2.08	-2.39	-2.63	-2.82	-2.97	-3.09	-3.48	-3.40

Increased price and wage flexibility and prudent valuation of housing collateral:

Small EMU member

Data Set by Archive - Percent Error

TEMP_SIM_PCER

	2011A	2012A	2013A	2014A	2015A	2016A	2017A	2018A	2019A	2020A	2030A	2040A
GDP.REAL_PCER	0.50	0.55	0.40	0.26	0.19	0.16	0.14	0.12	0.10	0.09	-0.02	-0.05
OUTPUT.T_PCER	0.35	0.26	0.07	-0.04	-0.05	-0.03	0.00	0.03	0.05	0.06	0.09	0.07
OUTPUT.NT_PCER	0.79	0.94	0.77	0.55	0.40	0.31	0.24	0.19	0.14	0.10	-0.12	-0.16
CAPITAL.T_PCER	0.05	0.17	0.26	0.31	0.34	0.35	0.36	0.35	0.35	0.34	0.18	0.07
CAPITAL.NT_PCER	0.02	0.07	0.10	0.12	0.13	0.13	0.12	0.11	0.09	0.08	-0.07	-0.17
EMPLOYMENT_PCER	0.48	0.54	0.39	0.24	0.17	0.13	0.11	0.09	0.07	0.06	-0.02	-0.03
.EMPLOYMENT.T_PCER	0.42	0.44	0.28	0.15	0.10	0.08	0.07	0.06	0.05	0.05	0.00	-0.00
.EMPLOYMENT.NT_PCER	0.57	0.71	0.56	0.38	0.28	0.22	0.17	0.14	0.10	0.07	-0.06	-0.07
DEMAND.DOM_PCER	0.86	1.07	0.87	0.62	0.45	0.35	0.27	0.20	0.15	0.10	-0.13	-0.17
CONSUMPTION_PCER	1.37	1.86	1.68	1.31	1.01	0.78	0.60	0.45	0.32	0.21	-0.27	-0.36
.CLC_PCER	1.24	1.70	1.67	1.43	1.19	0.98	0.81	0.66	0.53	0.42	-0.19	-0.27
.CCC_PCER	1.17	1.30	0.94	0.63	0.46	0.36	0.30	0.24	0.19	0.13	-0.21	-0.28
.CNLC_PCER	1.54	2.19	2.03	1.56	1.17	0.86	0.62	0.43	0.27	0.15	-0.35	-0.44
INVESTMENT.CAPITAL_PCER	1.12	1.41	1.03	0.64	0.37	0.20	0.09	0.01	-0.06	-0.10	-0.24	-0.22
.INVESTMENT.T_PCER	1.27	1.57	1.19	0.84	0.62	0.48	0.38	0.31	0.25	0.20	-0.00	-0.04
.INVESTMENT.NT_PCER	1.01	1.29	0.90	0.48	0.18	-0.01	-0.14	-0.22	-0.29	-0.33	-0.41	-0.35
INVESTMENT.HOUSE_PCER	-0.03	-0.48	-0.79	-0.86	-0.77	-0.63	-0.49	-0.37	-0.29	-0.23	-0.19	-0.21
GOVERNMENT.PURCHASES_PCER	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EXPORTS_PCER	-0.43	-0.76	-0.80	-0.68	-0.52	-0.36	-0.24	-0.13	-0.05	0.02	0.26	0.27
IMPORTS_PCER	1.26	1.80	1.65	1.28	0.94	0.67	0.46	0.29	0.15	0.04	-0.40	-0.43
REAL.WAGE_PCER	0.18	0.33	0.26	0.15	0.08	0.04	0.03	0.02	0.02	0.01	-0.03	-0.05
PRICE.LEVEL.GDP_PCER	0.56	1.08	1.19	1.06	0.86	0.67	0.51	0.37	0.27	0.18	-0.19	-0.26
.PRICE.LEVEL.T_PCER	0.36	0.75	0.85	0.78	0.65	0.51	0.40	0.30	0.23	0.17	-0.11	-0.17
.PRICE.LEVEL.NT_PCER	0.53	1.00	1.10	0.98	0.80	0.63	0.48	0.37	0.27	0.19	-0.14	-0.21
.PRICE.LEVEL.HOUSE_PCER	-0.12	-0.02	0.03	0.01	-0.04	-0.10	-0.14	-0.18	-0.21	-0.24	-0.37	-0.41
EXPORT.PRICES_PCER	0.36	0.75	0.85	0.78	0.65	0.51	0.40	0.30	0.23	0.17	-0.11	-0.17
IMPORT.PRICES_PCER	-0.05	-0.02	0.02	0.06	0.10	0.13	0.15	0.17	0.18	0.19	0.17	0.11
TOT_PCER	0.41	0.77	0.83	0.72	0.55	0.38	0.25	0.14	0.05	-0.02	-0.28	-0.29
REER_PCER	-0.61	-1.09	-1.16	-1.00	-0.76	-0.54	-0.36	-0.21	-0.09	0.01	0.37	0.38
EXR_PCER	-0.10	-0.06	-0.01	0.04	0.08	0.11	0.13	0.15	0.16	0.17	0.15	0.10

Data Set by Archive - Error

TEMP_SIM_ER

	2011A	2012A	2013A	2014A	2015A	2016A	2017A	2018A	2019A	2020A	2030A	2040A
NOM.INT.RATE_ER	0.03	0.06	0.06	0.05	0.03	0.03	0.02	0.02	0.01	0.01	-0.01	-0.01
REAL.INT.RATE_ER	-0.67	-0.18	0.12	0.23	0.24	0.20	0.16	0.13	0.10	0.09	0.01	-0.00
INFL.GDP_ER	0.83	0.34	-0.01	-0.17	-0.20	-0.18	-0.15	-0.12	-0.10	-0.08	-0.01	-0.00
INFL.PC_ER	0.69	0.28	-0.00	-0.14	-0.16	-0.14	-0.12	-0.10	-0.08	-0.06	-0.01	-0.00
LABOUR.TAX.RATE_ER	-0.14	-0.38	-0.51	-0.53	-0.49	-0.44	-0.38	-0.32	-0.27	-0.21	0.12	0.16
GOV.DEBT.GDP_ER	-0.52	-1.07	-1.20	-1.08	-0.87	-0.65	-0.44	-0.26	-0.09	0.05	0.52	0.23
GOV.BALANCE.GDP_ER	0.36	0.30	0.12	-0.02	-0.09	-0.11	-0.12	-0.11	-0.11	-0.10	0.00	0.02
GOV.EXP.GDP_ER	-0.34	-0.39	-0.29	-0.19	-0.14	-0.10	-0.08	-0.07	-0.05	-0.04	0.03	0.04
GOV.REV.GDP_ER	0.01	-0.11	-0.20	-0.25	-0.25	-0.23	-0.21	-0.19	-0.16	-0.13	0.06	0.07
TRADE.BAL.GDP_ER	-0.37	-0.51	-0.46	-0.36	-0.26	-0.19	-0.13	-0.08	-0.05	-0.01	0.11	0.12
CURRENT.ACC.GDP_ER	-0.37	-0.54	-0.52	-0.44	-0.36	-0.30	-0.25	-0.22	-0.19	-0.16	-0.06	-0.05
NFA.GDP_ER	-0.20	-0.69	-1.22	-1.66	-2.03	-2.32	-2.55	-2.74	-2.89	-3.02	-3.42	-3.36

B. Reforms and the correction of external imbalances:

Figure 4.1: 1 percentage-point steady-state price mark-up reduction in the total economy

Small EMU member

Data Set by Archive - Percent Error

TEMP_SIM_PCER

	2011A	2012A	2013A	2014A	2015A	2016A	2017A	2018A	2019A	2020A	2030A	2040A
GDP.REAL_PCER	-0.01	0.38	0.64	0.73	0.76	0.78	0.80	0.82	0.85	0.88	1.11	1.23
OUTPUT.T_PCER	0.74	1.71	2.15	2.30	2.34	2.34	2.35	2.37	2.39	2.42	2.64	2.77
OUTPUT.NT_PCER	-0.21	0.21	0.55	0.69	0.74	0.76	0.78	0.80	0.83	0.86	1.05	1.14
CAPITAL.T_PCER	0.04	0.18	0.38	0.58	0.77	0.95	1.12	1.27	1.42	1.56	2.55	3.10
CAPITAL.NT_PCER	0.02	0.09	0.19	0.31	0.43	0.55	0.66	0.77	0.86	0.96	1.64	2.03
EMPLOYMENT_PCER	-0.20	-0.03	0.12	0.14	0.12	0.10	0.08	0.07	0.07	0.08	0.09	0.08
.EMPLOYMENT.T_PCER	-0.10	0.13	0.29	0.31	0.28	0.25	0.23	0.23	0.23	0.23	0.23	0.23
.EMPLOYMENT.NT_PCER	-0.35	-0.28	-0.14	-0.11	-0.12	-0.14	-0.16	-0.16	-0.16	-0.16	-0.14	-0.15
DEMAND.DOM_PCER	-0.18	0.26	0.61	0.76	0.81	0.83	0.85	0.88	0.90	0.93	1.13	1.23
CONSUMPTION_PCER	-0.79	-0.70	-0.42	-0.26	-0.19	-0.15	-0.12	-0.08	-0.04	0.00	0.27	0.38
.CLC_PCER	0.44	1.04	1.54	1.86	2.06	2.17	2.24	2.30	2.35	2.40	2.65	2.71
.CCC_PCER	-0.49	0.59	1.36	1.71	1.87	1.96	2.04	2.12	2.20	2.27	2.70	2.79
.CNLC_PCER	-1.56	-2.19	-2.23	-2.25	-2.28	-2.31	-2.31	-2.30	-2.28	-2.26	-2.06	-1.91
INVESTMENT.CAPITAL_PCER	1.02	2.36	3.09	3.38	3.46	3.44	3.41	3.37	3.35	3.33	3.21	3.16
.INVESTMENT.T_PCER	1.10	2.34	2.92	3.13	3.18	3.18	3.19	3.21	3.23	3.26	3.48	3.62
.INVESTMENT.NT_PCER	0.96	2.37	3.22	3.58	3.67	3.64	3.57	3.50	3.44	3.39	3.01	2.81
INVESTMENT.HOUSE_PCER	-1.71	-1.51	-1.03	-0.75	-0.62	-0.56	-0.52	-0.48	-0.45	-0.42	-0.29	-0.32
GOVERNMENT.PURCHASES_PCER	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EXPORTS_PCER	0.85	1.44	1.59	1.59	1.58	1.57	1.58	1.60	1.63	1.65	1.85	1.99

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IMPORTS_PCER              -0.58   -0.45   -0.16    0.02    0.09    0.11    0.11    0.10    0.09    0.09    0.00   -0.08
REAL.WAGE_PCER             1.02    2.09    2.67    2.96    3.08    3.13    3.15    3.17    3.19    3.21    3.39    3.49
PRICE.LEVEL.GDP_PCER      -0.90   -1.56   -1.70   -1.69   -1.65   -1.63   -1.63   -1.65   -1.67   -1.69   -1.89   -2.04
.PRICE.LEVEL.T_PCER       -0.77   -1.40   -1.57   -1.59   -1.57   -1.56   -1.56   -1.58   -1.59   -1.61   -1.77   -1.88
.PRICE.LEVEL.NT_PCER      -0.71   -1.20   -1.28   -1.25   -1.20   -1.18   -1.18   -1.19   -1.21   -1.22   -1.38   -1.51
.PRICE.LEVEL.HOUSE_PCER   -1.49   -2.02   -2.08   -2.07   -2.05   -2.03   -2.03   -2.03   -2.03   -2.04   -2.07   -2.10
EXPORT.PRICES_PCER        -0.77   -1.40   -1.57   -1.59   -1.57   -1.56   -1.56   -1.58   -1.59   -1.61   -1.77   -1.88
IMPORT.PRICES_PCER         0.07    0.07    0.06    0.06    0.06    0.07    0.07    0.08    0.08    0.09    0.14    0.16
TOT_PCER                  -0.83   -1.46   -1.63   -1.65   -1.63   -1.63   -1.63   -1.65   -1.67   -1.70   -1.90   -2.04
REER_PCER                  0.98    1.67    1.82    1.80    1.76    1.75    1.75    1.77    1.80    1.83    2.09    2.27
EXR_PCER                   0.11    0.08    0.06    0.06    0.06    0.06    0.07    0.07    0.08    0.08    0.13    0.15
```

Data Set by Archive - Error

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        TEMP_SIM_ER

                          2011A   2012A   2013A   2014A   2015A   2016A   2017A   2018A   2019A   2020A   2030A   2040A

NOM.INT.RATE_ER           -0.03   -0.03   -0.01    0.00    0.01    0.01    0.01    0.01    0.01    0.01    0.00    0.00
REAL.INT.RATE_ER           0.97    0.24    0.00   -0.04   -0.02    0.00    0.02    0.03    0.03    0.03    0.02    0.01
INFL.GDP_ER               -1.29   -0.39   -0.05    0.04    0.03    0.01   -0.01   -0.02   -0.02   -0.02   -0.02   -0.01
INFL.PC_ER                -0.96   -0.27   -0.02    0.04    0.03    0.01   -0.00   -0.01   -0.02   -0.02   -0.01   -0.01
LABOUR.TAX.RATE_ER         0.10    0.20    0.14    0.04   -0.05   -0.13   -0.18   -0.23   -0.26   -0.29   -0.43   -0.44
GOV.DEBT.GDP_ER            0.25    0.31    0.04   -0.24   -0.44   -0.58   -0.67   -0.72   -0.75   -0.76   -0.52   -0.23
GOV.BALANCE.GDP_ER        -0.09    0.13    0.24    0.23    0.17    0.12    0.09    0.06    0.05    0.03   -0.02   -0.01
GOV.EXP.GDP_ER             0.13    0.01   -0.11   -0.14   -0.14   -0.13   -0.13   -0.13   -0.14   -0.15   -0.21   -0.24
GOV.REV.GDP_ER             0.04    0.14    0.13    0.08    0.02   -0.03   -0.07   -0.10   -0.13   -0.15   -0.25   -0.26
TRADE.BAL.GDP_ER           0.17    0.12    0.03   -0.03   -0.05   -0.06   -0.05   -0.05   -0.05   -0.05   -0.02   -0.00
CURRENT.ACC.GDP_ER         0.17    0.13    0.04   -0.01   -0.03   -0.04   -0.04   -0.04   -0.04   -0.04   -0.04   -0.03
NFA.GDP_ER                 0.10    0.26    0.33    0.33    0.30    0.25    0.20    0.16    0.11    0.07   -0.35   -0.63
```

Figure 4.2: 1 percentage-point steady-state price mark-up reduction in the T sector

Small EMU member

Data Set by Archive - Percent Error

```
        TEMP_SIM_PCER

                          2011A   2012A   2013A   2014A   2015A   2016A   2017A   2018A   2019A   2020A   2030A   2040A

GDP.REAL_PCER              0.08    0.30    0.41    0.44    0.44    0.45    0.46    0.48    0.50    0.52    0.68    0.77
OUTPUT.T_PCER              0.68    1.40    1.67    1.76    1.78    1.79    1.81    1.82    1.85    1.87    2.03    2.13
OUTPUT.NT_PCER            -0.12    0.04    0.14    0.17    0.17    0.18    0.18    0.19    0.21    0.23    0.35    0.42
CAPITAL.T_PCER             0.03    0.14    0.29    0.44    0.59    0.73    0.86    0.98    1.10    1.21    2.00    2.43
CAPITAL.NT_PCER            0.01    0.05    0.10    0.17    0.24    0.31    0.38    0.44    0.50    0.56    0.99    1.25
EMPLOYMENT_PCER           -0.08   -0.02    0.00   -0.01   -0.04   -0.06   -0.07   -0.07   -0.07   -0.07   -0.07   -0.07
.EMPLOYMENT.T_PCER         0.00    0.13    0.17    0.16    0.13    0.11    0.10    0.10    0.10    0.10    0.10    0.10
.EMPLOYMENT.NT_PCER       -0.21   -0.26   -0.25   -0.28   -0.30   -0.32   -0.33   -0.34   -0.34   -0.34   -0.33   -0.33
DEMAND.DOM_PCER            0.01    0.27    0.42    0.47    0.48    0.49    0.50    0.51    0.53    0.55    0.69    0.76
CONSUMPTION_PCER          -0.37   -0.38   -0.31   -0.28   -0.27   -0.27   -0.26   -0.24   -0.22   -0.20   -0.05    0.04
.CLC_PCER                  0.17    0.45    0.66    0.78    0.83    0.86    0.87    0.88    0.89    0.91    1.03    1.10
.CCC_PCER                 -0.21    0.29    0.60    0.71    0.75    0.77    0.79    0.82    0.84    0.87    1.07    1.14
.CNLC_PCER                -0.72   -1.12   -1.22   -1.28   -1.31   -1.32   -1.31   -1.30   -1.28   -1.26   -1.11   -1.01
INVESTMENT.CAPITAL_PCER    0.64    1.52    2.00    2.20    2.26    2.27    2.27    2.26    2.26    2.26    2.26    2.25
.INVESTMENT.T_PCER         0.85    1.80    2.24    2.39    2.44    2.46    2.48    2.50    2.53    2.55    2.74    2.85
.INVESTMENT.NT_PCER        0.48    1.31    1.82    2.05    2.12    2.13    2.11    2.08    2.06    2.04    1.89    1.79
INVESTMENT.HOUSE_PCER     -0.66   -0.61   -0.52   -0.49   -0.50   -0.51   -0.51   -0.50   -0.49   -0.48   -0.37   -0.32
GOVERNMENT.PURCHASES_PCER  0.00    0.00    0.00    0.00    0.00    0.00    0.00    0.00    0.00    0.00    0.00    0.00
EXPORTS_PCER               0.60    1.05    1.17    1.19    1.20    1.21    1.23    1.25    1.27    1.29    1.45    1.55
IMPORTS_PCER              -0.25   -0.16   -0.02    0.06    0.08    0.07    0.06    0.05    0.04    0.03   -0.04   -0.09
REAL.WAGE_PCER             0.51    1.06    1.34    1.46    1.51    1.53    1.54    1.55    1.57    1.58    1.71    1.78
PRICE.LEVEL.GDP_PCER      -0.36   -0.60   -0.64   -0.62   -0.60   -0.61   -0.62   -0.64   -0.67   -0.69   -0.85   -0.96
.PRICE.LEVEL.T_PCER       -0.63   -1.11   -1.25   -1.27   -1.28   -1.29   -1.30   -1.32   -1.34   -1.36   -1.50   -1.58
.PRICE.LEVEL.NT_PCER      -0.05   -0.04    0.02    0.07    0.09    0.09    0.08    0.07    0.05    0.03   -0.10   -0.19
.PRICE.LEVEL.HOUSE_PCER   -0.58   -0.70   -0.66   -0.64   -0.62   -0.62   -0.62   -0.62   -0.63   -0.63   -0.67   -0.69
EXPORT.PRICES_PCER        -0.63   -1.11   -1.25   -1.27   -1.28   -1.29   -1.30   -1.32   -1.34   -1.36   -1.50   -1.58
IMPORT.PRICES_PCER        -0.00   -0.02   -0.03   -0.03   -0.03   -0.03   -0.03   -0.03   -0.02   -0.02   -0.00    0.01
TOT_PCER                  -0.62   -1.10   -1.22   -1.24   -1.24   -1.26   -1.27   -1.29   -1.32   -1.34   -1.50   -1.59
REER_PCER                  0.36    0.60    0.63    0.60    0.59    0.59    0.61    0.64    0.66    0.69    0.88    1.00
EXR_PCER                  -0.00   -0.02   -0.03   -0.04   -0.04   -0.04   -0.03   -0.03   -0.03   -0.03   -0.01   -0.00
```

Data Set by Archive - Error

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        TEMP_SIM_ER

                          2011A   2012A   2013A   2014A   2015A   2016A   2017A   2018A   2019A   2020A   2030A   2040A

NOM.INT.RATE_ER           -0.02   -0.02   -0.01   -0.00    0.00    0.00    0.00    0.00    0.00    0.00    0.00    0.00
REAL.INT.RATE_ER           0.38    0.06   -0.02   -0.02   -0.00    0.01    0.02    0.03    0.03    0.02    0.02    0.01
INFL.GDP_ER               -0.51   -0.12    0.00    0.02    0.01   -0.01   -0.02   -0.02   -0.02   -0.02   -0.01   -0.01
INFL.PC_ER                -0.20   -0.02    0.03    0.03    0.01   -0.00   -0.01   -0.02   -0.02   -0.02   -0.01   -0.01
LABOUR.TAX.RATE_ER         0.04    0.07    0.04    0.01   -0.02   -0.03   -0.04   -0.05   -0.06   -0.06   -0.12   -0.15
GOV.DEBT.GDP_ER            0.07    0.05   -0.06   -0.15   -0.20   -0.22   -0.23   -0.23   -0.23   -0.23   -0.21   -0.14
GOV.BALANCE.GDP_ER        -0.03    0.06    0.08    0.06    0.04    0.02    0.01    0.01    0.01    0.01    0.00   -0.00
GOV.EXP.GDP_ER             0.06    0.01   -0.02   -0.02   -0.01   -0.00   -0.00   -0.01   -0.01   -0.02   -0.06   -0.08
GOV.REV.GDP_ER             0.03    0.07    0.06    0.04    0.02    0.01    0.00   -0.01   -0.01   -0.02   -0.06   -0.09
TRADE.BAL.GDP_ER           0.06    0.03   -0.01   -0.03   -0.04   -0.04   -0.04   -0.03   -0.03   -0.03   -0.01    0.01
CURRENT.ACC.GDP_ER         0.06    0.03   -0.01   -0.03   -0.04   -0.04   -0.04   -0.04   -0.03   -0.03   -0.03   -0.02
NFA.GDP_ER                 0.04    0.09    0.09    0.07    0.03   -0.01   -0.05   -0.08   -0.11   -0.15   -0.40   -0.56
```

Figure 4.3: 1 percentage-point steady-state price mark-up reduction in the NT sector

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Data Set by Archive - Percent Error

TEMP_SIM_PCER

	2011A	2012A	2013A	2014A	2015A	2016A	2017A	2018A	2019A	2020A	2030A	2040A
GDP.REAL_PCER	-0.08	0.08	0.23	0.29	0.31	0.32	0.33	0.33	0.34	0.35	0.42	0.45
OUTPUT.T_PCER	0.06	0.30	0.47	0.53	0.54	0.54	0.53	0.53	0.54	0.54	0.59	0.62
OUTPUT.NT_PCER	-0.09	0.18	0.41	0.52	0.56	0.58	0.59	0.60	0.62	0.63	0.70	0.72
CAPITAL.T_PCER	0.01	0.04	0.09	0.13	0.18	0.22	0.25	0.28	0.31	0.34	0.54	0.65
CAPITAL.NT_PCER	0.01	0.04	0.09	0.14	0.19	0.24	0.28	0.32	0.36	0.40	0.64	0.77
EMPLOYMENT_PCER	-0.12	-0.01	0.11	0.16	0.16	0.15	0.15	0.15	0.15	0.15	0.15	0.15
.EMPLOYMENT.T_PCER	-0.10	0.01	0.11	0.15	0.15	0.14	0.13	0.13	0.13	0.13	0.13	0.13
.EMPLOYMENT.NT_PCER	-0.14	-0.03	0.11	0.17	0.18	0.18	0.18	0.18	0.18	0.18	0.19	0.18
DEMAND.DOM_PCER	-0.19	-0.01	0.19	0.28	0.32	0.34	0.35	0.35	0.36	0.37	0.44	0.46
CONSUMPTION_PCER	-0.42	-0.31	-0.10	0.02	0.09	0.12	0.14	0.16	0.19	0.21	0.32	0.35
.CLC_PCER	0.27	0.59	0.87	1.07	1.21	1.30	1.36	1.40	1.44	1.47	1.60	1.59
.CCC_PCER	-0.28	0.30	0.75	0.99	1.11	1.18	1.24	1.29	1.34	1.38	1.62	1.63
.CNLC_PCER	-0.83	-1.06	-0.99	-0.95	-0.96	-0.97	-0.98	-0.98	-0.98	-0.98	-0.93	-0.88
INVESTMENT.CAPITAL_PCER	0.38	0.83	1.08	1.17	1.18	1.16	1.12	1.09	1.07	1.05	0.94	0.90
.INVESTMENT.T_PCER	0.24	0.53	0.67	0.72	0.72	0.71	0.69	0.69	0.69	0.69	0.72	0.75
.INVESTMENT.NT_PCER	0.48	1.06	1.38	1.51	1.53	1.50	1.45	1.40	1.36	1.33	1.10	1.01
INVESTMENT.HOUSE_PCER	-1.02	-0.88	-0.50	-0.25	-0.11	-0.04	-0.00	0.03	0.05	0.07	0.08	0.01
GOVERNMENT.PURCHASES_PCER	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EXPORTS_PCER	0.24	0.38	0.41	0.40	0.37	0.36	0.35	0.35	0.35	0.35	0.39	0.44
IMPORTS_PCER	-0.33	-0.29	-0.14	-0.04	0.01	0.04	0.05	0.05	0.06	0.06	0.04	0.00
REAL.WAGE_PCER	0.50	1.01	1.31	1.47	1.55	1.57	1.58	1.59	1.59	1.60	1.65	1.67
PRICE.LEVEL.GDP_PCER	-0.54	-0.95	-1.07	-1.07	-1.05	-1.02	-1.01	-1.00	-1.00	-1.00	-1.04	-1.08
.PRICE.LEVEL.T_PCER	-0.14	-0.28	-0.33	-0.32	-0.29	-0.28	-0.26	-0.26	-0.26	-0.26	-0.27	-0.30
.PRICE.LEVEL.NT_PCER	-0.67	-1.16	-1.30	-1.31	-1.29	-1.27	-1.26	-1.25	-1.25	-1.25	-1.28	-1.32
.PRICE.LEVEL.HOUSE_PCER	-0.90	-1.32	-1.41	-1.43	-1.42	-1.41	-1.41	-1.40	-1.40	-1.40	-1.40	-1.41
EXPORT.PRICES_PCER	-0.14	-0.28	-0.33	-0.32	-0.29	-0.28	-0.26	-0.26	-0.26	-0.26	-0.27	-0.30
IMPORT.PRICES_PCER	0.07	0.08	0.09	0.09	0.10	0.10	0.10	0.10	0.11	0.11	0.14	0.15
TOT_PCER	-0.21	-0.37	-0.42	-0.41	-0.39	-0.37	-0.37	-0.36	-0.36	-0.37	-0.41	-0.45
REER_PCER	0.61	1.05	1.18	1.18	1.16	1.14	1.13	1.12	1.13	1.13	1.19	1.25
EXR_PCER	0.11	0.10	0.09	0.09	0.10	0.10	0.10	0.11	0.11	0.11	0.14	0.16

Data Set by Archive - Error

TEMP_SIM_ER

	2011A	2012A	2013A	2014A	2015A	2016A	2017A	2018A	2019A	2020A	2030A	2040A
NOM.INT.RATE_ER	-0.01	-0.01	-0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
REAL.INT.RATE_ER	0.59	0.18	0.03	-0.02	-0.02	-0.01	-0.00	0.00	0.00	0.01	0.01	0.01
INFL.GDP_ER	-0.77	-0.26	-0.05	0.02	0.03	0.02	0.01	0.00	0.00	-0.00	-0.00	-0.00
INFL.PC_ER	-0.76	-0.25	-0.05	0.01	0.02	0.02	0.01	0.00	0.00	-0.00	-0.00	-0.00
LABOUR.TAX.RATE_ER	0.06	0.13	0.10	0.03	-0.03	-0.09	-0.14	-0.18	-0.21	-0.23	-0.32	-0.29
GOV.DEBT.GDP_ER	0.18	0.26	0.10	-0.08	-0.24	-0.36	-0.44	-0.49	-0.52	-0.53	-0.32	-0.09
GOV.BALANCE.GDP_ER	-0.06	0.07	0.15	0.16	0.13	0.10	0.08	0.05	0.04	0.03	-0.02	-0.01
GOV.EXP.GDP_ER	0.07	-0.01	-0.09	-0.12	-0.13	-0.13	-0.13	-0.13	-0.13	-0.13	-0.15	-0.16
GOV.REV.GDP_ER	0.02	0.07	0.07	0.04	-0.00	-0.04	-0.07	-0.09	-0.11	-0.13	-0.18	-0.17
TRADE.BAL.GDP_ER	0.11	0.09	0.04	0.01	-0.01	-0.02	-0.02	-0.02	-0.02	-0.02	-0.02	-0.01
CURRENT.ACC.GDP_ER	0.11	0.10	0.05	0.02	0.00	-0.00	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01
NFA.GDP_ER	0.06	0.17	0.23	0.26	0.26	0.26	0.25	0.24	0.22	0.21	0.05	-0.07

Figure 4.4: Real wage reduction of 1 percent on impact:

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Data Set by Archive - Percent Error

TEMP_SIM_PCER

	2011A	2012A	2013A	2014A	2015A	2016A	2017A	2018A	2019A	2020A	2030A	2040A
GDP.REAL_PCER	0.44	1.22	1.84	2.21	2.40	2.49	2.54	2.57	2.60	2.63	2.73	2.73
OUTPUT.T_PCER	0.39	1.18	1.85	2.24	2.41	2.47	2.48	2.47	2.47	2.47	2.52	2.57
OUTPUT.NT_PCER	0.13	0.72	1.35	1.80	2.06	2.21	2.29	2.35	2.40	2.44	2.57	2.51
CAPITAL.T_PCER	-0.01	-0.01	0.03	0.11	0.19	0.27	0.35	0.42	0.47	0.53	0.84	0.99
CAPITAL.NT_PCER	-0.01	-0.00	0.02	0.08	0.14	0.21	0.28	0.34	0.40	0.45	0.73	0.84
EMPLOYMENT_PCER	0.59	1.49	2.13	2.49	2.65	2.72	2.76	2.78	2.80	2.81	2.85	2.80
.EMPLOYMENT.T_PCER	0.64	1.58	2.23	2.57	2.72	2.77	2.80	2.81	2.82	2.83	2.86	2.82
.EMPLOYMENT.NT_PCER	0.51	1.35	1.99	2.36	2.55	2.65	2.70	2.73	2.76	2.79	2.84	2.77
DEMAND.DOM_PCER	0.23	0.93	1.62	2.08	2.35	2.49	2.57	2.62	2.67	2.70	2.80	2.75
CONSUMPTION_PCER	0.18	0.84	1.56	2.09	2.43	2.65	2.80	2.91	3.00	3.08	3.32	3.22
.CLC_PCER	-0.70	-0.92	-0.37	0.37	1.06	1.62	2.05	2.39	2.66	2.87	3.30	2.89
.CCC_PCER	-1.15	-0.82	0.21	1.03	1.60	1.98	2.25	2.47	2.64	2.80	3.28	2.99
.CNLC_PCER	1.24	2.51	3.17	3.45	3.52	3.49	3.43	3.38	3.34	3.32	3.35	3.50
INVESTMENT.CAPITAL_PCER	-0.25	0.25	0.96	1.45	1.68	1.73	1.69	1.63	1.55	1.49	1.13	1.09
.INVESTMENT.T_PCER	-0.24	0.20	0.78	1.14	1.28	1.30	1.27	1.22	1.19	1.16	1.09	1.15
.INVESTMENT.NT_PCER	-0.25	0.28	1.10	1.69	1.98	2.06	2.02	1.93	1.83	1.73	1.16	1.04
INVESTMENT.HOUSE_PCER	-1.10	-1.04	-0.25	0.53	1.13	1.53	1.80	1.98	2.12	2.22	2.12	1.60
GOVERNMENT.PURCHASES_PCER	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EXPORTS_PCER	0.68	1.39	1.73	1.83	1.82	1.77	1.72	1.68	1.66	1.65	1.70	1.82
IMPORTS_PCER	-0.69	-0.99	-0.79	-0.50	-0.25	-0.08	0.03	0.09	0.14	0.17	0.16	-0.01
REAL.WAGE_PCER	-1.00	-1.58	-1.45	-1.19	-0.99	-0.88	-0.83	-0.82	-0.81	-0.80	-0.75	-0.73
PRICE.LEVEL.GDP_PCER	-0.81	-1.79	-2.30	-2.48	-2.49	-2.45	-2.40	-2.37	-2.35	-2.33	-2.41	-2.55
.PRICE.LEVEL.T_PCER	-0.57	-1.31	-1.71	-1.87	-1.90	-1.89	-1.86	-1.85	-1.84	-1.83	-1.90	-2.00

	2011A	2012A	2013A	2014A	2015A	2016A	2017A	2018A	2019A	2020A	2030A	2040A
.PRICE.LEVEL.NT_PCER	-0.74	-1.62	-2.07	-2.22	-2.22	-2.18	-2.14	-2.11	-2.09	-2.08	-2.14	-2.27
.PRICE.LEVEL.HOUSE_PCER	0.31	0.15	-0.01	-0.09	-0.10	-0.10	-0.09	-0.09	-0.09	-0.09	-0.11	-0.15
EXPORT.PRICES_PCER	-0.57	-1.31	-1.71	-1.87	-1.90	-1.89	-1.86	-1.85	-1.84	-1.83	-1.90	-2.00
IMPORT.PRICES_PCER	0.08	0.08	0.05	0.01	-0.03	-0.06	-0.09	-0.11	-0.13	-0.14	-0.16	-0.13
TOT_PCER	-0.65	-1.39	-1.76	-1.88	-1.88	-1.83	-1.78	-1.74	-1.71	-1.70	-1.74	-1.87
REER_PCER	0.91	1.92	2.43	2.57	2.55	2.47	2.39	2.33	2.29	2.27	2.33	2.50
EXR_PCER	0.14	0.11	0.06	0.01	-0.03	-0.06	-0.09	-0.11	-0.13	-0.14	-0.16	-0.14

Data Set by Archive - Error

TEMP_SIM_ER

	2011A	2012A	2013A	2014A	2015A	2016A	2017A	2018A	2019A	2020A	2030A	2040A
NOM.INT.RATE_ER	-0.02	-0.05	-0.05	-0.04	-0.04	-0.03	-0.02	-0.02	-0.01	-0.01	0.00	0.00
REAL.INT.RATE_ER	1.16	0.63	0.22	0.01	-0.07	-0.08	-0.06	-0.04	-0.03	-0.02	0.02	0.01
INFL.GDP_ER	-1.27	-0.81	-0.36	-0.09	0.02	0.05	0.04	0.03	0.02	0.01	-0.01	-0.01
INFL.PC_ER	-1.03	-0.65	-0.29	-0.08	0.01	0.04	0.03	0.02	0.01	0.01	-0.01	-0.01
LABOUR.TAX.RATE_ER	0.02	-0.07	-0.38	-0.81	-1.25	-1.65	-1.99	-2.27	-2.50	-2.68	-3.02	-2.67
GOV.DEBT.GDP_ER	-0.12	-0.60	-1.51	-2.50	-3.36	-4.01	-4.44	-4.69	-4.78	-4.76	-2.14	-0.28
GOV.BALANCE.GDP_ER	0.28	0.74	0.97	0.97	0.84	0.66	0.49	0.33	0.21	0.10	-0.20	-0.08
GOV.EXP.GDP_ER	-0.30	-0.80	-1.16	-1.36	-1.46	-1.51	-1.53	-1.54	-1.55	-1.56	-1.60	-1.58
GOV.REV.GDP_ER	-0.03	-0.09	-0.27	-0.51	-0.78	-1.03	-1.24	-1.42	-1.56	-1.67	-1.89	-1.67
TRADE.BAL.GDP_ER	0.21	0.28	0.21	0.12	0.05	-0.00	-0.03	-0.05	-0.06	-0.07	-0.07	-0.02
CURRENT.ACC.GDP_ER	0.21	0.30	0.24	0.16	0.09	0.05	0.02	-0.00	-0.02	-0.03	-0.05	-0.02
NFA.GDP_ER	0.11	0.40	0.66	0.84	0.93	0.98	0.99	0.97	0.94	0.90	0.31	-0.09

Figure 4.5: 5 percentage-point expenditure-based reduction of public debt to GDP:

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Data Set by Archive - Percent Error

TEMP_SIM_PCER

	2011A	2012A	2013A	2014A	2015A	2016A	2017A	2018A	2019A	2020A	2030A	2040A
GDP.REAL_PCER	-0.23	-0.12	-0.07	-0.05	-0.04	-0.04	-0.04	-0.05	-0.06	-0.08	0.07	0.07
OUTPUT.T_PCER	-0.17	-0.01	0.02	0.04	0.05	0.06	0.06	0.05	0.03	-0.02	0.04	0.03
OUTPUT.NT_PCER	-0.35	-0.20	-0.14	-0.12	-0.11	-0.11	-0.11	-0.12	-0.13	-0.16	0.10	0.09
CAPITAL.T_PCER	-0.00	-0.00	0.00	0.01	0.02	0.03	0.04	0.05	0.07	0.07	0.07	0.06
CAPITAL.NT_PCER	-0.00	-0.00	-0.00	0.00	0.01	0.02	0.03	0.04	0.05	0.07	0.10	0.10
EMPLOYMENT_PCER	-0.22	-0.13	-0.08	-0.06	-0.06	-0.06	-0.06	-0.07	-0.09	-0.11	0.06	0.05
.EMPLOYMENT.T_PCER	-0.20	-0.10	-0.05	-0.04	-0.03	-0.04	-0.04	-0.05	-0.07	-0.09	0.05	0.05
.EMPLOYMENT.NT_PCER	-0.25	-0.16	-0.11	-0.09	-0.09	-0.09	-0.10	-0.11	-0.13	-0.13	0.07	0.07
DEMAND.DOM_PCER	-0.33	-0.20	-0.14	-0.11	-0.10	-0.09	-0.09	-0.09	-0.11	-0.13	0.10	0.10
CONSUMPTION_PCER	0.20	0.39	0.46	0.49	0.50	0.51	0.51	0.51	0.50	0.46	0.89	0.90
.CLC_PCER	-0.09	-0.09	-0.07	-0.05	-0.04	-0.04	-0.04	-0.04	-0.04	-0.03	1.07	1.07
.CCC_PCER	-0.06	0.05	0.13	0.17	0.19	0.21	0.22	0.24	0.23	0.12	1.04	1.10
.CNLC_PCER	0.48	0.80	0.89	0.92	0.93	0.92	0.92	0.91	0.90	0.87	0.73	0.73
INVESTMENT.CAPITAL_PCER	-0.03	0.00	0.07	0.13	0.19	0.23	0.27	0.30	0.30	0.28	0.08	0.07
.INVESTMENT.T_PCER	-0.02	0.02	0.07	0.11	0.15	0.17	0.19	0.20	0.20	0.18	0.05	0.04
.INVESTMENT.NT_PCER	-0.04	-0.01	0.07	0.15	0.22	0.28	0.33	0.37	0.38	0.35	0.11	0.09
INVESTMENT.HOUSE_PCER	0.05	0.07	0.07	0.05	0.01	-0.04	-0.11	-0.17	-0.19	0.06	0.60	0.48
GOVERNMENT.PURCHASES_PCER	-2.63	-2.63	-2.63	-2.63	-2.63	-2.63	-2.63	-2.63	-2.63	-2.63	-2.63	-2.63
EXPORTS_PCER	0.07	0.12	0.14	0.14	0.14	0.14	0.13	0.12	0.10	0.07	-0.02	-0.02
IMPORTS_PCER	-0.36	-0.28	-0.24	-0.22	-0.20	-0.19	-0.18	-0.17	-0.16	-0.17	0.09	0.09
REAL.WAGE_PCER	-0.03	-0.06	-0.04	-0.02	-0.01	-0.00	-0.00	-0.01	-0.01	0.01	0.01	0.01
PRICE.LEVEL.GDP_PCER	-0.09	-0.16	-0.18	-0.19	-0.20	-0.20	-0.20	-0.19	-0.18	-0.14	-0.00	0.01
.PRICE.LEVEL.T_PCER	-0.05	-0.11	-0.13	-0.14	-0.14	-0.14	-0.14	-0.14	-0.13	-0.11	-0.01	0.00
.PRICE.LEVEL.NT_PCER	-0.09	-0.15	-0.17	-0.18	-0.18	-0.18	-0.18	-0.18	-0.17	-0.14	-0.01	0.01
.PRICE.LEVEL.HOUSE_PCER	0.31	0.38	0.38	0.37	0.37	0.37	0.37	0.36	0.37	0.38	0.42	0.43
EXPORT.PRICES_PCER	-0.05	-0.11	-0.13	-0.14	-0.14	-0.14	-0.14	-0.14	-0.13	-0.11	-0.01	0.00
IMPORT.PRICES_PCER	0.01	0.01	0.01	0.01	0.01	0.00	-0.01	-0.02	-0.02	-0.03	-0.03	-0.02
TOT_PCER	-0.07	-0.12	-0.14	-0.15	-0.15	-0.14	-0.14	-0.13	-0.11	-0.07	0.02	0.02
REER_PCER	0.11	0.17	0.20	0.21	0.20	0.20	0.19	0.18	0.15	0.11	-0.03	-0.03
EXR_PCER	0.02	0.02	0.02	0.01	0.01	0.01	-0.00	-0.01	-0.02	-0.03	-0.03	-0.02

Data Set by Archive - Error

TEMP_SIM_ER

	2011A	2012A	2013A	2014A	2015A	2016A	2017A	2018A	2019A	2020A	2030A	2040A
NOM.INT.RATE_ER	-0.00	-0.00	-0.00	-0.00	-0.00	-0.01	-0.01	-0.01	-0.01	-0.01	0.00	0.00
REAL.INT.RATE_ER	0.08	0.03	0.01	-0.00	-0.00	-0.01	-0.01	-0.02	-0.04	-0.07	-0.00	0.00
INFL.GDP_ER	-0.13	-0.05	-0.02	-0.00	-0.00	-0.00	0.00	0.01	0.02	0.05	0.00	0.00
INFL.PC_ER	-0.11	-0.04	-0.01	-0.00	-0.00	-0.00	-0.00	0.00	0.01	0.04	0.00	0.00
LABOUR.TAX.RATE_ER	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.92	-0.92
GOV.DEBT.GDP_ER	-0.12	-0.56	-1.05	-1.55	-2.07	-2.59	-3.11	-3.63	-4.15	-4.66	-5.00	-5.00
GOV.BALANCE.GDP_ER	0.37	0.47	0.52	0.56	0.59	0.61	0.63	0.65	0.66	0.67	0.18	0.18
GOV.EXP.GDP_ER	-0.33	-0.39	-0.43	-0.44	-0.44	-0.44	-0.44	-0.44	-0.43	-0.42	-0.49	-0.49
GOV.REV.GDP_ER	0.04	0.05	0.05	0.06	0.06	0.06	0.06	0.06	0.05	0.05	-0.53	-0.53
TRADE.BAL.GDP_ER	0.11	0.08	0.07	0.06	0.06	0.05	0.05	0.05	0.05	0.05	-0.03	-0.03
CURRENT.ACC.GDP_ER	0.11	0.09	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.01	0.01
NFA.GDP_ER	0.07	0.16	0.24	0.32	0.39	0.46	0.52	0.59	0.66	0.72	0.73	0.70

Figure 4.6: 5 percentage-point revenue-based reduction of public debt to GDP:

Small EMU member

Data Set by Archive - Percent Error

TEMP_SIM_PCER

	2011A	2012A	2013A	2014A	2015A	2016A	2017A	2018A	2019A	2020A	2030A	2040A
GDP.REAL_PCER	-0.20	-0.26	-0.23	-0.17	-0.11	-0.06	-0.02	0.00	0.02	0.03	0.04	0.03
OUTPUT.T_PCER	-0.11	-0.10	-0.05	0.00	0.03	0.04	0.05	0.04	0.04	0.03	0.01	0.00
OUTPUT.NT_PCER	-0.31	-0.42	-0.39	-0.30	-0.21	-0.13	-0.07	-0.02	0.01	0.03	0.06	0.05
CAPITAL.T_PCER	0.00	0.01	0.02	0.03	0.05	0.06	0.07	0.08	0.08	0.08	0.07	0.05
CAPITAL.NT_PCER	-0.00	0.00	0.01	0.02	0.03	0.05	0.06	0.07	0.07	0.08	0.09	0.08
EMPLOYMENT_PCER	-0.21	-0.29	-0.27	-0.21	-0.15	-0.10	-0.06	-0.03	-0.01	0.00	0.02	0.01
.EMPLOYMENT.T_PCER	-0.18	-0.25	-0.22	-0.17	-0.11	-0.07	-0.04	-0.02	-0.01	0.00	0.01	0.01
.EMPLOYMENT.NT_PCER	-0.25	-0.36	-0.34	-0.27	-0.20	-0.13	-0.08	-0.04	-0.02	0.00	0.03	0.02
DEMAND.DOM_PCER	-0.29	-0.40	-0.36	-0.27	-0.18	-0.10	-0.04	-0.00	0.02	0.04	0.06	0.06
CONSUMPTION_PCER	-0.47	-0.68	-0.66	-0.54	-0.40	-0.27	-0.17	-0.09	-0.03	0.01	0.09	0.09
.CLC_PCER	-1.15	-1.83	-1.90	-1.65	-1.28	-0.91	-0.59	-0.34	-0.15	-0.03	0.13	0.12
.CCC_PCER	-1.02	-1.44	-1.42	-1.22	-0.97	-0.74	-0.54	-0.38	-0.26	-0.18	0.10	0.14
.CNLC_PCER	0.13	0.27	0.33	0.34	0.31	0.27	0.22	0.18	0.14	0.12	0.06	0.05
INVESTMENT.CAPITAL_PCER	0.00	0.11	0.23	0.31	0.33	0.31	0.28	0.23	0.19	0.16	0.06	0.05
.INVESTMENT.T_PCER	0.01	0.11	0.20	0.24	0.24	0.22	0.19	0.15	0.12	0.10	0.04	0.03
.INVESTMENT.NT_PCER	-0.00	0.11	0.25	0.35	0.39	0.38	0.34	0.30	0.25	0.21	0.08	0.07
INVESTMENT.HOUSE_PCER	-0.72	-1.18	-1.18	-0.95	-0.64	-0.34	-0.09	0.10	0.24	0.33	0.34	0.24
GOVERNMENT.PURCHASES_PCER	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EXPORTS_PCER	0.09	0.17	0.20	0.18	0.15	0.11	0.07	0.04	0.02	-0.00	-0.04	-0.05
IMPORTS_PCER	-0.32	-0.46	-0.44	-0.36	-0.25	-0.15	-0.08	-0.02	0.02	0.05	0.09	0.09
REAL.WAGE_PCER	-0.04	-0.07	-0.05	-0.02	0.01	0.03	0.03	0.04	0.03	0.03	0.02	0.02
PRICE.LEVEL.GDP_PCER	-0.12	-0.24	-0.29	-0.28	-0.24	-0.19	-0.14	-0.10	-0.07	-0.04	0.02	0.04
.PRICE.LEVEL.T_PCER	-0.07	-0.16	-0.20	-0.20	-0.17	-0.14	-0.11	-0.08	-0.06	-0.04	0.01	0.02
.PRICE.LEVEL.NT_PCER	-0.12	-0.23	-0.27	-0.26	-0.22	-0.18	-0.13	-0.09	-0.06	-0.04	0.02	0.03
.PRICE.LEVEL.HOUSE_PCER	-0.08	-0.14	-0.16	-0.16	-0.15	-0.14	-0.12	-0.11	-0.10	-0.09	-0.07	-0.06
EXPORT.PRICES_PCER	-0.07	-0.16	-0.20	-0.20	-0.17	-0.14	-0.11	-0.08	-0.06	-0.04	0.01	0.02
IMPORT.PRICES_PCER	0.01	0.01	0.00	-0.01	-0.02	-0.03	-0.04	-0.04	-0.04	-0.05	-0.04	-0.02
TOT_PCER	-0.09	-0.17	-0.20	-0.19	-0.16	-0.11	-0.07	-0.04	-0.02	0.00	0.04	0.05
REER_PCER	0.13	0.26	0.30	0.27	0.22	0.16	0.11	0.06	0.02	-0.00	-0.06	-0.07
EXR_PCER	0.03	0.02	0.01	-0.00	-0.01	-0.02	-0.03	-0.04	-0.04	-0.04	-0.03	-0.02

Data Set by Archive - Error

TEMP_SIM_ER

	2011A	2012A	2013A	2014A	2015A	2016A	2017A	2018A	2019A	2020A	2030A	2040A
NOM.INT.RATE_ER	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.00	-0.00	-0.00	0.00	0.00
REAL.INT.RATE_ER	0.15	0.06	-0.01	-0.05	-0.06	-0.06	-0.05	-0.04	-0.03	-0.02	-0.00	-0.00
INFL.GDP_ER	-0.18	-0.09	-0.02	0.03	0.05	0.05	0.05	0.04	0.03	0.02	0.00	0.00
INFL.PC_ER	-0.15	-0.08	-0.02	0.02	0.04	0.04	0.04	0.03	0.02	0.02	0.00	0.00
LABOUR.TAX.RATE_ER	0.93	1.49	1.57	1.38	1.09	0.79	0.52	0.31	0.16	0.05	-0.09	-0.09
GOV.DEBT.GDP_ER	-0.16	-0.80	-1.67	-2.55	-3.32	-3.92	-4.36	-4.66	-4.85	-4.96	-5.01	-5.00
GOV.BALANCE.GDP_ER	0.49	0.84	0.95	0.90	0.78	0.64	0.51	0.40	0.32	0.26	0.18	0.18
GOV.EXP.GDP_ER	0.10	0.13	0.11	0.08	0.05	0.03	0.01	-0.00	-0.01	-0.01	-0.02	-0.02
GOV.REV.GDP_ER	0.58	0.94	0.99	0.87	0.69	0.50	0.33	0.20	0.10	0.03	-0.06	-0.05
TRADE.BAL.GDP_ER	0.09	0.13	0.13	0.10	0.07	0.04	0.02	0.01	-0.01	-0.01	-0.03	-0.03
CURRENT.ACC.GDP_ER	0.10	0.14	0.14	0.12	0.10	0.07	0.05	0.04	0.03	0.02	0.01	0.01
NFA.GDP_ER	0.05	0.18	0.32	0.45	0.54	0.62	0.66	0.70	0.72	0.73	0.75	0.73

Figure 4.7 Area-wide 1 percentage-point price mark-up reductions in T and NT sectors:

Small EMU member

Data Set by Archive - Percent Error

TEMP_SIM_PCER

	2011A	2012A	2013A	2014A	2015A	2016A	2017A	2018A	2019A	2020A	2030A	2040A
GDP.REAL_PCER	0.34	0.71	0.82	0.84	0.86	0.89	0.93	0.97	1.01	1.05	1.33	1.49
OUTPUT.T_PCER	1.18	2.06	2.35	2.42	2.45	2.48	2.52	2.56	2.59	2.63	2.90	3.08
OUTPUT.NT_PCER	0.25	0.70	0.87	0.92	0.95	0.98	1.02	1.06	1.10	1.13	1.40	1.54
CAPITAL.T_PCER	0.07	0.26	0.48	0.70	0.90	1.09	1.27	1.44	1.61	1.76	2.90	3.58
CAPITAL.NT_PCER	0.03	0.14	0.27	0.42	0.56	0.70	0.83	0.96	1.08	1.19	2.07	2.61
EMPLOYMENT_PCER	0.10	0.24	0.23	0.17	0.14	0.12	0.12	0.12	0.12	0.12	0.13	0.13
.EMPLOYMENT.T_PCER	0.19	0.37	0.37	0.31	0.28	0.26	0.25	0.25	0.26	0.26	0.26	0.26
.EMPLOYMENT.NT_PCER	-0.04	0.03	0.01	-0.04	-0.07	-0.09	-0.09	-0.09	-0.08	-0.08	-0.07	-0.07
DEMAND.DOM_PCER	0.22	0.66	0.83	0.88	0.91	0.94	0.98	1.01	1.05	1.09	1.34	1.48
CONSUMPTION_PCER	-0.25	0.04	0.18	0.23	0.27	0.32	0.37	0.42	0.48	0.53	0.87	1.06
.CLC_PCER	0.77	1.71	2.26	2.53	2.68	2.77	2.84	2.91	2.97	3.02	3.33	3.45
.CCC_PCER	0.34	1.74	2.25	2.41	2.51	2.60	2.69	2.77	2.85	2.93	3.37	3.52
.CNLC_PCER	-1.04	-1.60	-1.83	-1.94	-1.98	-1.98	-1.95	-1.92	-1.89	-1.85	-1.53	-1.29
INVESTMENT.CAPITAL_PCER	1.69	3.24	3.78	3.93	3.95	3.95	3.95	3.95	3.95	3.95	3.95	3.99
.INVESTMENT.T_PCER	1.65	2.98	3.35	3.42	3.44	3.48	3.52	3.56	3.61	3.65	4.01	4.26
.INVESTMENT.NT_PCER	1.72	3.43	4.11	4.31	4.34	4.32	4.28	4.24	4.21	4.17	3.91	3.78
INVESTMENT.HOUSE_PCER	-0.95	-0.89	-0.88	-0.90	-0.87	-0.80	-0.72	-0.64	-0.56	-0.48	-0.05	0.10
GOVERNMENT.PURCHASES_PCER	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EXPORTS_PCER	1.24	1.86	1.99	2.00	2.01	2.04	2.08	2.11	2.15	2.19	2.49	2.68
IMPORTS_PCER	0.22	0.93	1.24	1.34	1.37	1.38	1.40	1.42	1.43	1.44	1.51	1.54
REAL.WAGE_PCER	1.16	2.31	2.85	3.08	3.18	3.23	3.26	3.29	3.32	3.35	3.59	3.73
PRICE.LEVEL.GDP_PCER	-0.69	-1.13	-1.21	-1.20	-1.17	-1.14	-1.11	-1.09	-1.07	-1.05	-0.90	-0.85
.PRICE.LEVEL.T_PCER	-0.66	-1.19	-1.35	-1.37	-1.35	-1.32	-1.30	-1.27	-1.25	-1.23	-1.06	-0.98

```
.PRICE.LEVEL.NT_PCER          -0.53   -0.87   -0.91   -0.88   -0.84   -0.81   -0.78   -0.75   -0.72   -0.70   -0.53   -0.46
.PRICE.LEVEL.HOUSE_PCER       -0.89   -1.29   -1.38   -1.39   -1.36   -1.33   -1.29   -1.26   -1.23   -1.21   -0.98   -0.85
EXPORT.PRICES_PCER            -0.66   -1.19   -1.35   -1.37   -1.35   -1.32   -1.30   -1.27   -1.25   -1.23   -1.06   -0.98
IMPORT.PRICES_PCER            -0.06   -0.43   -0.57   -0.59   -0.56   -0.52   -0.48   -0.45   -0.41   -0.37   -0.06    0.11
TOT_PCER                      -0.60   -0.77   -0.78   -0.79   -0.79   -0.80   -0.82   -0.83   -0.85   -0.86   -1.00   -1.09
REER_PCER                      0.66    0.81    0.81    0.80    0.80    0.81    0.82    0.83    0.85    0.87    1.02    1.13
EXR_PCER                       0.54    0.23    0.04   -0.01    0.01    0.05    0.10    0.15    0.20    0.25    0.62    0.84
```

Data Set by Archive - Error

```
        TEMP_SIM_ER

                              2011A   2012A   2013A   2014A   2015A   2016A   2017A   2018A   2019A   2020A   2030A   2040A

NOM.INT.RATE_ER               -0.31   -0.28   -0.09    0.01    0.05    0.07    0.07    0.06    0.06    0.06    0.04    0.02
REAL.INT.RATE_ER               0.37   -0.12   -0.09   -0.02    0.02    0.04    0.04    0.04    0.04    0.04    0.03    0.02
INFL.GDP_ER                   -0.95   -0.24   -0.03    0.03    0.03    0.03    0.03    0.02    0.02    0.02    0.01    0.00
INFL.PC_ER                    -0.74   -0.21   -0.02    0.03    0.04    0.03    0.03    0.03    0.02    0.02    0.01    0.00
LABOUR.TAX.RATE_ER             0.01   -0.07   -0.20   -0.31   -0.39   -0.44   -0.49   -0.53   -0.56   -0.59   -0.73   -0.76
GOV.DEBT.GDP_ER               -0.10   -0.42   -0.74   -0.93   -1.03   -1.08   -1.10   -1.10   -1.09   -1.07   -0.65   -0.33
GOV.BALANCE.GDP_ER             0.20    0.39    0.29    0.16    0.09    0.05    0.03    0.01    0.00   -0.01   -0.03   -0.02
GOV.EXP.GDP_ER                -0.10   -0.24   -0.27   -0.25   -0.24   -0.25   -0.26   -0.27   -0.28   -0.29   -0.38   -0.43
GOV.REV.GDP_ER                 0.01    0.00   -0.06   -0.13   -0.18   -0.22   -0.25   -0.28   -0.30   -0.32   -0.43   -0.46
TRADE.BAL.GDP_ER               0.12    0.04   -0.02   -0.04   -0.05   -0.05   -0.05   -0.04   -0.04   -0.04   -0.01    0.01
CURRENT.ACC.GDP_ER             0.12    0.05   -0.01   -0.03   -0.04   -0.04   -0.04   -0.04   -0.04   -0.04   -0.04   -0.03
NFA.GDP_ER                     0.08    0.16    0.17    0.14    0.10    0.05    0.01   -0.04   -0.08   -0.12   -0.48   -0.70
```

Rest of EMU

Data Set by Archive - Percent Error

```
        TEMP_SIM_PCER

                              2011A   2012A   2013A   2014A   2015A   2016A   2017A   2018A   2019A   2020A   2030A   2040A

GDP.REAL_PCER                  0.51    0.85    0.88    0.86    0.87    0.89    0.93    0.98    1.02    1.06    1.34    1.50
OUTPUT.T_PCER                  1.36    2.13    2.29    2.31    2.32    2.36    2.40    2.44    2.48    2.52    2.81    2.99
OUTPUT.NT_PCER                 0.46    0.90    0.99    0.99    0.99    1.01    1.05    1.09    1.12    1.16    1.42    1.56
CAPITAL.T_PCER                 0.07    0.27    0.50    0.71    0.92    1.10    1.28    1.45    1.61    1.76    2.89    3.56
CAPITAL.NT_PCER                0.04    0.16    0.31    0.46    0.62    0.76    0.90    1.03    1.16    1.28    2.19    2.74
EMPLOYMENT_PCER                0.27    0.39    0.31    0.22    0.16    0.15    0.14    0.14    0.15    0.15    0.15    0.14
.EMPLOYMENT.T_PCER             0.35    0.50    0.42    0.32    0.27    0.25    0.25    0.25    0.25    0.26    0.26    0.26
.EMPLOYMENT.NT_PCER            0.14    0.22    0.15    0.05   -0.00   -0.02   -0.02   -0.02   -0.02   -0.02   -0.02   -0.03
DEMAND.DOM_PCER                0.40    0.85    0.95    0.94    0.95    0.97    1.00    1.04    1.08    1.11    1.35    1.48
CONSUMPTION_PCER              -0.06    0.27    0.36    0.36    0.38    0.41    0.46    0.51    0.55    0.60    0.91    1.09
.CLC_PCER                      0.89    1.93    2.47    2.69    2.80    2.86    2.91    2.96    3.01    3.06    3.32    3.44
.CCC_PCER                      0.63    2.08    2.50    2.58    2.63    2.69    2.77    2.85    2.92    2.98    3.37    3.51
.CNLC_PCER                    -0.86   -1.41   -1.69   -1.84   -1.89   -1.89   -1.86   -1.82   -1.78   -1.75   -1.44   -1.22
INVESTMENT.CAPITAL_PCER        1.90    3.51    4.01    4.11    4.11    4.10    4.09    4.08    4.08    4.07    4.04    4.05
.INVESTMENT.T_PCER             1.78    3.08    3.38    3.41    3.42    3.45    3.49    3.54    3.59    3.63    3.99    4.23
.INVESTMENT.NT_PCER            1.99    3.83    4.49    4.64    4.63    4.59    4.54    4.50    4.45    4.40    4.07    3.91
INVESTMENT.HOUSE_PCER         -0.62   -0.56   -0.68   -0.81   -0.84   -0.81   -0.74   -0.67   -0.59   -0.52   -0.10    0.07
GOVERNMENT.PURCHASES_PCER      0.00    0.00    0.00    0.00    0.00    0.00    0.00    0.00    0.00    0.00    0.00    0.00
EXPORTS_PCER                   1.40    1.69    1.62    1.58    1.59    1.64    1.69    1.74    1.79    1.84    2.22    2.46
IMPORTS_PCER                  -0.11    0.62    0.97    1.06    1.06    1.05    1.04    1.03    1.02    0.95    0.90
REAL.WAGE_PCER                 1.23    2.40    2.90    3.07    3.14    3.17    3.20    3.24    3.27    3.30    3.54    3.68
PRICE.LEVEL.GDP_PCER          -0.56   -0.82   -0.83   -0.79   -0.75   -0.73   -0.71   -0.69   -0.67   -0.65   -0.50   -0.43
.PRICE.LEVEL.T_PCER           -0.55   -0.96   -1.06   -1.06   -1.04   -1.01   -0.99   -0.97   -0.94   -0.92   -0.73   -0.63
.PRICE.LEVEL.NT_PCER          -0.36   -0.51   -0.48   -0.42   -0.38   -0.35   -0.32   -0.30   -0.28   -0.26   -0.08    0.01
.PRICE.LEVEL.HOUSE_PCER       -0.61   -0.88   -0.93   -0.92   -0.89   -0.86   -0.83   -0.80   -0.77   -0.74   -0.51   -0.37
EXPORT.PRICES_PCER            -0.55   -0.96   -1.06   -1.06   -1.04   -1.01   -0.99   -0.97   -0.94   -0.92   -0.73   -0.63
IMPORT.PRICES_PCER             0.41    0.07   -0.11   -0.15   -0.12   -0.07   -0.02    0.04    0.09    0.14    0.57    0.81
TOT_PCER                      -0.95   -1.03   -0.94   -0.91   -0.91   -0.94   -0.97   -1.01   -1.04   -1.06   -1.29   -1.43
REER_PCER                      1.02    0.97    0.79    0.71    0.71    0.74    0.78    0.82    0.86    0.89    1.17    1.35
EXR_PCER                       0.54    0.23    0.04   -0.01    0.01    0.05    0.10    0.15    0.20    0.25    0.62    0.84
```

Data Set by Archive - Error

```
        TEMP_SIM_ER

                              2011A   2012A   2013A   2014A   2015A   2016A   2017A   2018A   2019A   2020A   2030A   2040A

NOM.INT.RATE_ER               -0.31   -0.28   -0.09    0.01    0.05    0.07    0.07    0.06    0.06    0.06    0.04    0.02
REAL.INT.RATE_ER               0.16   -0.23   -0.13   -0.02    0.03    0.04    0.05    0.04    0.04    0.04    0.03    0.02
INFL.GDP_ER                   -0.74   -0.10    0.03    0.04    0.03    0.02    0.02    0.02    0.02    0.02    0.01    0.00
INFL.PC_ER                    -0.51   -0.10    0.02    0.04    0.04    0.03    0.03    0.02    0.02    0.02    0.02    0.01
LABOUR.TAX.RATE_ER            -0.03   -0.17   -0.33   -0.43   -0.49   -0.54   -0.57   -0.59   -0.62   -0.64   -0.74   -0.77
GOV.DEBT.GDP_ER               -0.25   -0.69   -1.01   -1.16   -1.19   -1.19   -1.17   -1.14   -1.10   -1.06   -0.60   -0.31
GOV.BALANCE.GDP_ER             0.29    0.44    0.27    0.12    0.04    0.01   -0.01   -0.01   -0.02   -0.02   -0.03   -0.01
GOV.EXP.GDP_ER                -0.20   -0.33   -0.31   -0.27   -0.25   -0.26   -0.27   -0.28   -0.29   -0.31   -0.39   -0.45
GOV.REV.GDP_ER                -0.00   -0.05   -0.13   -0.20   -0.25   -0.28   -0.30   -0.32   -0.34   -0.35   -0.44   -0.46
TRADE.BAL.GDP_ER               0.11    0.00   -0.06   -0.08   -0.08   -0.07   -0.07   -0.06   -0.06   -0.05   -0.01    0.02
CURRENT.ACC.GDP_ER             0.11    0.01   -0.06   -0.08   -0.08   -0.08   -0.08   -0.08   -0.08   -0.08   -0.06   -0.05
NFA.GDP_ER                     0.08    0.12    0.09    0.01   -0.07   -0.15   -0.23   -0.30   -0.37   -0.44   -0.99   -1.31
```

Figure 4.8: Area-wide 1 percent real wage reduction:

Small EMU member

Data Set by Archive - Percent Error

```
        TEMP_SIM_PCER
```

	2011A	2012A	2013A	2014A	2015A	2016A	2017A	2018A	2019A	2020A	2030A	2040A
GDP.REAL_PCER	1.40	2.53	3.09	3.36	3.50	3.59	3.67	3.74	3.80	3.85	4.09	4.16
OUTPUT.T_PCER	1.62	2.59	3.12	3.35	3.46	3.52	3.56	3.61	3.64	3.68	3.89	4.02
OUTPUT.NT_PCER	1.15	2.14	2.75	3.07	3.27	3.40	3.51	3.60	3.68	3.75	4.01	4.03
CAPITAL.T_PCER	0.03	0.15	0.30	0.45	0.60	0.73	0.84	0.95	1.04	1.13	1.71	2.08
CAPITAL.NT_PCER	0.03	0.11	0.24	0.38	0.52	0.64	0.76	0.87	0.97	1.06	1.65	1.99
EMPLOYMENT_PCER	1.51	2.79	3.36	3.59	3.69	3.76	3.80	3.85	3.88	3.91	3.98	3.93
.EMPLOYMENT.T_PCER	1.58	2.87	3.43	3.64	3.73	3.78	3.82	3.85	3.88	3.91	3.97	3.93
.EMPLOYMENT.NT_PCER	1.40	2.67	3.26	3.52	3.64	3.72	3.78	3.84	3.88	3.92	3.99	3.91
DEMAND.DOM_PCER	1.21	2.36	3.00	3.32	3.50	3.62	3.71	3.79	3.86	3.92	4.14	4.16
CONSUMPTION_PCER	1.21	2.60	3.42	3.89	4.19	4.43	4.62	4.78	4.92	5.04	5.45	5.43
.CLC_PCER	-0.32	0.08	1.02	1.94	2.71	3.34	3.85	4.27	4.61	4.89	5.47	5.03
.CCC_PCER	-0.43	0.74	1.97	2.78	3.34	3.78	4.15	4.46	4.72	4.94	5.51	5.15
.CNLC_PCER	2.74	4.73	5.31	5.40	5.34	5.28	5.22	5.19	5.17	5.16	5.42	5.76
INVESTMENT.CAPITAL_PCER	1.14	2.50	3.17	3.37	3.35	3.26	3.15	3.04	2.95	2.87	2.55	2.66
.INVESTMENT.T_PCER	0.88	1.86	2.29	2.38	2.36	2.30	2.26	2.22	2.20	2.18	2.26	2.50
.INVESTMENT.NT_PCER	1.34	2.99	3.84	4.12	4.11	3.98	3.82	3.67	3.52	3.39	2.77	2.78
INVESTMENT.HOUSE_PCER	0.70	1.73	2.30	2.54	2.63	2.66	2.67	2.69	2.69	2.70	2.48	2.18
GOVERNMENT.PURCHASES_PCER	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EXPORTS_PCER	1.78	2.58	2.91	3.01	3.04	3.05	3.06	3.07	3.09	3.11	3.34	3.54
IMPORTS_PCER	0.25	0.90	1.43	1.74	1.92	2.04	2.12	2.19	2.24	2.29	2.35	2.27
REAL.WAGE_PCER	-1.00	-1.58	-1.49	-1.32	-1.19	-1.12	-1.06	-1.02	-0.98	-0.95	-0.75	-0.66
PRICE.LEVEL.GDP_PCER	-0.80	-1.81	-2.56	-3.11	-3.53	-3.87	-4.14	-4.36	-4.53	-4.67	-5.06	-5.06
.PRICE.LEVEL.T_PCER	-0.55	-1.46	-2.19	-2.75	-3.19	-3.54	-3.83	-4.05	-4.24	-4.38	-4.75	-4.71
.PRICE.LEVEL.NT_PCER	-0.67	-1.66	-2.41	-2.96	-3.38	-3.72	-3.99	-4.21	-4.38	-4.52	-4.89	-4.88
.PRICE.LEVEL.HOUSE_PCER	0.99	0.84	0.36	-0.06	-0.39	-0.65	-0.85	-1.02	-1.15	-1.25	-1.42	-1.30
EXPORT.PRICES_PCER	-0.55	-1.46	-2.19	-2.75	-3.19	-3.54	-3.83	-4.05	-4.24	-4.38	-4.75	-4.71
IMPORT.PRICES_PCER	0.31	-0.38	-1.07	-1.66	-2.13	-2.51	-2.82	-3.06	-3.24	-3.39	-3.67	-3.52
TOT_PCER	-0.86	-1.08	-1.13	-1.11	-1.08	-1.06	-1.04	-1.04	-1.03	-1.02	-1.12	-1.24
REER_PCER	1.01	1.31	1.38	1.35	1.31	1.28	1.25	1.24	1.23	1.23	1.34	1.48
EXR_PCER	1.27	0.80	0.13	-0.49	-1.01	-1.42	-1.75	-2.01	-2.21	-2.37	-2.68	-2.49

Data Set by Archive - Error

```
        TEMP_SIM_ER
```

	2011A	2012A	2013A	2014A	2015A	2016A	2017A	2018A	2019A	2020A	2030A	2040A
NOM.INT.RATE_ER	-0.36	-0.70	-0.70	-0.58	-0.45	-0.36	-0.28	-0.22	-0.16	-0.12	0.04	0.02
REAL.INT.RATE_ER	0.75	0.16	-0.07	-0.10	-0.08	-0.05	-0.03	-0.02	-0.00	0.00	0.04	0.03
INFL.GDP_ER	-1.22	-0.93	-0.68	-0.51	-0.40	-0.32	-0.26	-0.21	-0.17	-0.13	-0.00	-0.01
INFL.PC_ER	-0.98	-0.90	-0.68	-0.51	-0.40	-0.32	-0.26	-0.21	-0.17	-0.13	0.00	-0.00
LABOUR.TAX.RATE_ER	-0.14	-0.60	-1.25	-1.90	-2.47	-2.96	-3.37	-3.70	-3.97	-4.18	-4.55	-4.14
GOV.DEBT.GDP_ER	-0.85	-2.26	-3.74	-4.97	-5.88	-6.49	-6.84	-7.00	-6.99	-6.85	-2.99	-0.53
GOV.BALANCE.GDP_ER	0.91	1.62	1.64	1.39	1.09	0.82	0.58	0.39	0.23	0.10	-0.27	-0.11
GOV.EXP.GDP_ER	-0.90	-1.65	-1.99	-2.13	-2.20	-2.24	-2.27	-2.30	-2.32	-2.35	-2.43	-2.44
GOV.REV.GDP_ER	-0.11	-0.38	-0.76	-1.16	-1.52	-1.82	-2.08	-2.29	-2.46	-2.59	-2.83	-2.56
TRADE.BAL.GDP_ER	0.19	0.16	0.09	0.04	0.00	-0.02	-0.04	-0.05	-0.06	-0.06	-0.05	-0.00
CURRENT.ACC.GDP_ER	0.19	0.17	0.11	0.06	0.02	0.00	-0.01	-0.03	-0.04	-0.04	-0.06	-0.03
NFA.GDP_ER	0.12	0.30	0.43	0.50	0.53	0.53	0.52	0.49	0.45	0.40	-0.19	-0.55

Rest of EMU

Data Set by Archive - Percent Error

```
        TEMP_SIM_PCER
```

	2011A	2012A	2013A	2014A	2015A	2016A	2017A	2018A	2019A	2020A	2030A	2040A
GDP.REAL_PCER	1.65	2.81	3.35	3.60	3.73	3.82	3.90	3.98	4.04	4.10	4.35	4.42
OUTPUT.T_PCER	1.95	2.90	3.39	3.58	3.67	3.73	3.78	3.82	3.86	3.90	4.14	4.29
OUTPUT.NT_PCER	1.40	2.44	3.03	3.34	3.52	3.65	3.76	3.86	3.94	4.01	4.27	4.28
CAPITAL.T_PCER	0.04	0.17	0.33	0.49	0.64	0.77	0.90	1.01	1.11	1.20	1.84	2.24
CAPITAL.NT_PCER	0.03	0.13	0.26	0.41	0.55	0.69	0.81	0.93	1.03	1.13	1.77	2.13
EMPLOYMENT_PCER	1.74	3.08	3.63	3.84	3.93	3.99	4.04	4.09	4.12	4.15	4.22	4.16
.EMPLOYMENT.T_PCER	1.82	3.16	3.69	3.89	3.97	4.02	4.06	4.09	4.12	4.15	4.21	4.17
.EMPLOYMENT.NT_PCER	1.62	2.95	3.52	3.77	3.88	3.96	4.03	4.08	4.13	4.16	4.23	4.14
DEMAND.DOM_PCER	1.41	2.63	3.25	3.56	3.74	3.86	3.96	4.05	4.13	4.19	4.41	4.42
CONSUMPTION_PCER	1.39	2.87	3.69	4.17	4.47	4.71	4.91	5.08	5.23	5.35	5.76	5.72
.CLC_PCER	-0.25	0.24	1.23	2.18	2.97	3.61	4.13	4.56	4.91	5.19	5.77	5.30
.CCC_PCER	-0.23	1.02	2.24	3.05	3.61	4.06	4.44	4.76	5.03	5.25	5.82	5.43
.CNLC_PCER	2.97	5.05	5.62	5.69	5.64	5.58	5.53	5.50	5.49	5.48	5.73	6.06
INVESTMENT.CAPITAL_PCER	1.31	2.74	3.38	3.56	3.54	3.45	3.34	3.25	3.16	3.08	2.75	2.82
.INVESTMENT.T_PCER	1.03	2.04	2.43	2.50	2.47	2.42	2.39	2.37	2.35	2.34	2.45	2.68
.INVESTMENT.NT_PCER	1.53	3.26	4.10	4.36	4.34	4.22	4.07	3.92	3.77	3.65	2.98	2.93
INVESTMENT.HOUSE_PCER	0.89	1.95	2.50	2.73	2.80	2.83	2.85	2.86	2.87	2.88	2.63	2.30
GOVERNMENT.PURCHASES_PCER	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EXPORTS_PCER	2.23	2.87	3.00	2.96	2.90	2.85	2.83	2.81	2.81	2.82	3.12	3.44
IMPORTS_PCER	-0.43	0.14	0.65	0.99	1.19	1.33	1.42	1.50	1.56	1.60	1.56	1.36
REAL.WAGE_PCER	-1.00	-1.57	-1.50	-1.34	-1.23	-1.16	-1.11	-1.07	-1.03	-1.00	-0.78	-0.69
PRICE.LEVEL.GDP_PCER	-0.74	-1.68	-2.39	-2.93	-3.35	-3.69	-3.97	-4.20	-4.38	-4.52	-4.91	-4.90
.PRICE.LEVEL.T_PCER	-0.47	-1.30	-2.00	-2.55	-2.99	-3.35	-3.64	-3.87	-4.06	-4.20	-4.57	-4.51
.PRICE.LEVEL.NT_PCER	-0.60	-1.54	-2.26	-2.80	-3.23	-3.57	-3.84	-4.06	-4.24	-4.38	-4.75	-4.73
.PRICE.LEVEL.HOUSE_PCER	1.27	1.21	0.74	0.33	-0.00	-0.27	-0.47	-0.64	-0.77	-0.87	-1.04	-0.92
EXPORT.PRICES_PCER	-0.47	-1.30	-2.00	-2.55	-2.99	-3.35	-3.64	-3.87	-4.06	-4.20	-4.57	-4.51
IMPORT.PRICES_PCER	1.06	0.50	-0.19	-0.81	-1.31	-1.71	-2.03	-2.28	-2.47	-2.61	-2.81	-2.56
TOT_PCER	-1.51	-1.79	-1.81	-1.75	-1.70	-1.67	-1.64	-1.63	-1.63	-1.63	-1.81	-2.00

```
REER_PCER                  1.88   2.30   2.35   2.27   2.20   2.14   2.11   2.09   2.08   2.08   2.30   2.56
EXR_PCER                   1.27   0.80   0.13  -0.49  -1.01  -1.42  -1.75  -2.01  -2.21  -2.37  -2.68  -2.49
```

Data Set by Archive - Error

```
        TEMP_SIM_ER

                          2011A  2012A  2013A  2014A  2015A  2016A  2017A  2018A  2019A  2020A  2030A  2040A

NOM.INT.RATE_ER           -0.36  -0.70  -0.70  -0.58  -0.46  -0.36  -0.28  -0.22  -0.16  -0.12   0.04   0.02
REAL.INT.RATE_ER           0.65   0.10  -0.09  -0.10  -0.07  -0.05  -0.03  -0.01  -0.00   0.01   0.04   0.03
INFL.GDP_ER               -1.13  -0.87  -0.65  -0.50  -0.40  -0.33  -0.27  -0.22  -0.17  -0.14   0.00  -0.00
INFL.PC_ER                -0.82  -0.84  -0.66  -0.51  -0.41  -0.33  -0.27  -0.22  -0.17  -0.13   0.00  -0.00
LABOUR.TAX.RATE_ER        -0.18  -0.71  -1.41  -2.09  -2.69  -3.19  -3.61  -3.95  -4.23  -4.44  -4.81  -4.37
GOV.DEBT.GDP_ER           -1.03  -2.59  -4.15  -5.41  -6.32  -6.92  -7.27  -7.40  -7.37  -7.21  -3.12  -0.55
GOV.BALANCE.GDP_ER         1.03   1.72   1.71   1.43   1.11   0.83   0.59   0.39   0.22   0.09  -0.28  -0.11
GOV.EXP.GDP_ER            -1.04  -1.81  -2.13  -2.26  -2.33  -2.37  -2.40  -2.43  -2.46  -2.48  -2.57  -2.58
GOV.REV.GDP_ER            -0.13  -0.44  -0.86  -1.27  -1.65  -1.96  -2.22  -2.44  -2.61  -2.75  -2.98  -2.71
TRADE.BAL.GDP_ER           0.23   0.18   0.10   0.03  -0.01  -0.04  -0.06  -0.07  -0.08  -0.09  -0.06   0.00
CURRENT.ACC.GDP_ER         0.23   0.19   0.12   0.06   0.02  -0.01  -0.03  -0.05  -0.06  -0.07  -0.09  -0.05
NFA.GDP_ER                 0.14   0.36   0.49   0.56   0.58   0.57   0.53   0.48   0.42   0.35  -0.51  -1.03
```

Figure 4.9: Area-wide 5 percentage-point reduction of public debt to GDP

Small EMU member

Data Set by Archive - Percent Error

```
        TEMP_SIM_PCER

                          2011A  2012A  2013A  2014A  2015A  2016A  2017A  2018A  2019A  2020A  2030A  2040A

GDP.REAL_PCER             -0.18  -0.06  -0.03  -0.01  -0.01  -0.01  -0.01  -0.03  -0.06  -0.11   0.08   0.08
OUTPUT.T_PCER             -0.12   0.02   0.06   0.08   0.09   0.10   0.09   0.06   0.01  -0.09   0.06   0.05
OUTPUT.NT_PCER            -0.28  -0.12  -0.08  -0.07  -0.07  -0.07  -0.08  -0.10  -0.13  -0.19   0.10   0.09
CAPITAL.T_PCER             0.00   0.02   0.03   0.05   0.06   0.08   0.10   0.12   0.14   0.14   0.11   0.09
CAPITAL.NT_PCER            0.00   0.01   0.02   0.04   0.05   0.07   0.09   0.11   0.12   0.13   0.13   0.11
EMPLOYMENT_PCER           -0.17  -0.08  -0.05  -0.04  -0.04  -0.05  -0.06  -0.08  -0.11  -0.14   0.06   0.05
.EMPLOYMENT.T_PCER        -0.15  -0.06  -0.03  -0.02  -0.02  -0.02  -0.03  -0.05  -0.09  -0.13   0.05   0.05
.EMPLOYMENT.NT_PCER       -0.20  -0.11  -0.08  -0.07  -0.08  -0.08  -0.09  -0.11  -0.14  -0.16   0.06   0.06
DEMAND.DOM_PCER           -0.25  -0.11  -0.07  -0.05  -0.04  -0.04  -0.04  -0.06  -0.09  -0.14   0.10   0.09
CONSUMPTION_PCER           0.28   0.48   0.53   0.54   0.55   0.55   0.55   0.55   0.52   0.47   0.90   0.90
.CLC_PCER                 -0.06  -0.04  -0.02  -0.00   0.00   0.00  -0.01  -0.03  -0.05  -0.05   1.08   1.07
.CCC_PCER                  0.04   0.14   0.18   0.20   0.21   0.24   0.26   0.29   0.29   0.16   1.07   1.10
.CNLC_PCER                 0.56   0.89   0.96   0.98   0.98   0.98   0.97   0.96   0.92   0.87   0.73   0.72
INVESTMENT.CAPITAL_PCER    0.12   0.24   0.31   0.37   0.42   0.47   0.49   0.47   0.41   0.31   0.08   0.07
.INVESTMENT.T_PCER         0.10   0.19   0.23   0.26   0.30   0.33   0.35   0.34   0.30   0.22   0.07   0.06
.INVESTMENT.NT_PCER        0.13   0.27   0.37   0.45   0.51   0.57   0.59   0.57   0.50   0.37   0.09   0.07
INVESTMENT.HOUSE_PCER      0.26   0.35   0.33   0.28   0.21   0.12  -0.00  -0.14  -0.23  -0.03   0.49   0.42
GOVERNMENT.PURCHASES_PCER -2.63  -2.63  -2.63  -2.63  -2.63  -2.63  -2.63  -2.63  -2.63  -2.63  -2.63  -2.63
EXPORTS_PCER               0.02   0.11   0.13   0.14   0.14   0.14   0.14   0.11   0.06  -0.02   0.02   0.02
IMPORTS_PCER              -0.32  -0.15  -0.11  -0.09  -0.07  -0.07  -0.06  -0.08  -0.10  -0.15   0.09   0.09
REAL.WAGE_PCER            -0.00  -0.01   0.01   0.03   0.03   0.03   0.02   0.00  -0.02  -0.01   0.02   0.02
PRICE.LEVEL.GDP_PCER      -0.06  -0.09  -0.10  -0.13  -0.17  -0.22  -0.28  -0.34  -0.39  -0.41  -0.27  -0.18
.PRICE.LEVEL.T_PCER       -0.03  -0.05  -0.07  -0.09  -0.13  -0.18  -0.24  -0.30  -0.35  -0.38  -0.28  -0.18
.PRICE.LEVEL.NT_PCER      -0.06  -0.08  -0.09  -0.12  -0.16  -0.21  -0.27  -0.33  -0.39  -0.41  -0.28  -0.18
.PRICE.LEVEL.HOUSE_PCER    0.34   0.43   0.42   0.40   0.38   0.34   0.29   0.24   0.19   0.15   0.21   0.27
EXPORT.PRICES_PCER        -0.03  -0.05  -0.07  -0.09  -0.13  -0.18  -0.24  -0.30  -0.35  -0.38  -0.28  -0.18
IMPORT.PRICES_PCER         0.07   0.05   0.03   0.00  -0.03  -0.08  -0.15  -0.22  -0.30  -0.35  -0.29  -0.19
TOT_PCER                  -0.09  -0.09  -0.10  -0.10  -0.10  -0.09  -0.09  -0.08  -0.06  -0.03   0.01   0.01
REER_PCER                  0.12   0.12   0.12   0.12   0.12   0.12   0.11   0.10   0.08   0.04  -0.01  -0.02
EXR_PCER                   0.17   0.15   0.13   0.11   0.08   0.04  -0.02  -0.10  -0.19  -0.28  -0.26  -0.18
```

Data Set by Archive - Error

```
        TEMP_SIM_ER

                          2011A  2012A  2013A  2014A  2015A  2016A  2017A  2018A  2019A  2020A  2030A  2040A

NOM.INT.RATE_ER           -0.03  -0.03  -0.03  -0.03  -0.05  -0.06  -0.08  -0.10  -0.10  -0.08   0.01   0.01
REAL.INT.RATE_ER          -0.00  -0.01  -0.01  -0.00  -0.00  -0.01  -0.02  -0.04  -0.07  -0.11  -0.00  -0.00
INFL.GDP_ER               -0.07  -0.02  -0.02  -0.03  -0.04  -0.05  -0.06  -0.06  -0.04   0.00   0.01   0.01
INFL.PC_ER                -0.05  -0.02  -0.02  -0.03  -0.04  -0.06  -0.06  -0.06  -0.05  -0.01   0.01   0.01
LABOUR.TAX.RATE_ER         0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00  -0.93  -0.92
GOV.DEBT.GDP_ER           -0.17  -0.69  -1.21  -1.75  -2.28  -2.82  -3.37  -3.91  -4.43  -4.94  -5.01  -5.00
GOV.BALANCE.GDP_ER         0.42   0.52   0.57   0.60   0.63   0.66   0.69   0.70   0.71   0.69   0.18   0.18
GOV.EXP.GDP_ER            -0.36  -0.43  -0.45  -0.46  -0.46  -0.46  -0.46  -0.45  -0.42  -0.40  -0.50  -0.49
GOV.REV.GDP_ER             0.04   0.05   0.06   0.06   0.06   0.06   0.06   0.06   0.05   0.05  -0.54  -0.53
TRADE.BAL.GDP_ER           0.07   0.05   0.04   0.04   0.04   0.03   0.03   0.03   0.03   0.03  -0.02  -0.02
CURRENT.ACC.GDP_ER         0.07   0.05   0.05   0.05   0.05   0.05   0.05   0.05   0.05   0.05   0.01   0.00
NFA.GDP_ER                 0.05   0.11   0.15   0.20   0.24   0.28   0.32   0.37   0.41   0.45   0.44   0.42
```

Rest of EMU

Data Set by Archive - Percent Error

```
        TEMP_SIM_PCER

                          2011A  2012A  2013A  2014A  2015A  2016A  2017A  2018A  2019A  2020A  2030A  2040A

GDP.REAL_PCER             -0.15  -0.05  -0.02  -0.01  -0.01  -0.01  -0.01  -0.03  -0.06  -0.11   0.08   0.08
OUTPUT.T_PCER             -0.09   0.04   0.06   0.08   0.09   0.09   0.09   0.06   0.01  -0.09   0.05   0.05
OUTPUT.NT_PCER            -0.26  -0.10  -0.07  -0.06  -0.06  -0.06  -0.07  -0.09  -0.13  -0.19   0.10   0.10
```

```
CAPITAL.T_PCER              0.00    0.02    0.03    0.04    0.06    0.08    0.09    0.11    0.12    0.13    0.10    0.08
CAPITAL.NT_PCER             0.00    0.01    0.02    0.03    0.05    0.07    0.08    0.10    0.11    0.12    0.13    0.12
EMPLOYMENT_PCER            -0.15   -0.07   -0.04   -0.04   -0.04   -0.05   -0.05   -0.07   -0.11   -0.14    0.06    0.05
.EMPLOYMENT.T_PCER        -0.13   -0.05   -0.02   -0.02   -0.02   -0.02   -0.03   -0.05   -0.09   -0.13    0.05    0.05
.EMPLOYMENT.NT_PCER       -0.18   -0.10   -0.07   -0.07   -0.07   -0.08   -0.09   -0.11   -0.14   -0.16    0.07    0.06
DEMAND.DOM_PCER           -0.24   -0.10   -0.07   -0.04   -0.05   -0.05   -0.05   -0.07   -0.10   -0.15    0.10    0.10
CONSUMPTION_PCER           0.28    0.48    0.52    0.53    0.54    0.54    0.54    0.54    0.52    0.46    0.90    0.90
.CLC_PCER                 -0.05   -0.03   -0.01   -0.00    0.00    0.00   -0.01   -0.02   -0.05   -0.05    1.09    1.07
.CCC_PCER                  0.06    0.16    0.18    0.20    0.21    0.23    0.26    0.28    0.28    0.16    1.07    1.10
.CNLC_PCER                 0.56    0.89    0.95    0.96    0.96    0.96    0.96    0.94    0.91    0.86    0.73    0.73
INVESTMENT.CAPITAL_PCER    0.12    0.23    0.29    0.33    0.38    0.42    0.44    0.43    0.38    0.29    0.09    0.07
.INVESTMENT.T_PCER         0.10    0.18    0.21    0.24    0.27    0.30    0.31    0.31    0.27    0.20    0.07    0.06
.INVESTMENT.NT_PCER        0.13    0.26    0.34    0.41    0.47    0.51    0.54    0.52    0.46    0.36    0.10    0.08
INVESTMENT.HOUSE_PCER      0.28    0.37    0.34    0.28    0.21    0.12   -0.00   -0.14   -0.23   -0.03    0.49    0.42
GOVERNMENT.PURCHASES_PCER -2.63   -2.63   -2.63   -2.63   -2.63   -2.63   -2.63   -2.63   -2.63   -2.63   -2.63   -2.63
EXPORTS_PCER               0.19    0.21    0.21    0.22    0.22    0.22    0.21    0.18    0.12    0.03   -0.02   -0.02
IMPORTS_PCER              -0.39   -0.22   -0.18   -0.16   -0.15   -0.14   -0.13   -0.14   -0.14   -0.16    0.11    0.10
REAL.WAGE_PCER             0.01    0.00    0.02    0.03    0.04    0.03    0.02    0.00   -0.02   -0.01    0.02    0.02
PRICE.LEVEL.GDP_PCER      -0.05   -0.06   -0.08   -0.10   -0.14   -0.19   -0.25   -0.31   -0.37   -0.39   -0.27   -0.18
.PRICE.LEVEL.T_PCER       -0.01   -0.03   -0.04   -0.06   -0.10   -0.15   -0.21   -0.28   -0.34   -0.37   -0.28   -0.18
.PRICE.LEVEL.NT_PCER      -0.05   -0.05   -0.07   -0.09   -0.13   -0.18   -0.24   -0.31   -0.37   -0.40   -0.27   -0.18
.PRICE.LEVEL.HOUSE_PCER    0.35    0.45    0.44    0.42    0.39    0.36    0.31    0.25    0.20    0.16    0.21    0.28
EXPORT.PRICES_PCER        -0.01   -0.03   -0.04   -0.06   -0.10   -0.15   -0.21   -0.28   -0.34   -0.37   -0.28   -0.18
IMPORT.PRICES_PCER         0.15    0.12    0.09    0.07    0.03   -0.02   -0.09   -0.17   -0.26   -0.34   -0.30   -0.21
TOT_PCER                  -0.16   -0.14   -0.13   -0.13   -0.13   -0.13   -0.13   -0.11   -0.08   -0.03    0.02    0.02
REER_PCER                  0.21    0.19    0.18    0.17    0.17    0.17    0.17    0.15    0.11    0.05   -0.03   -0.03
EXR_PCER                   0.17    0.15    0.13    0.11    0.08    0.04   -0.02   -0.10   -0.19   -0.28   -0.26   -0.18
```

Data Set by Archive - Error

```
        TEMP_SIM_ER

                    2011A   2012A   2013A   2014A   2015A   2016A   2017A   2018A   2019A   2020A   2030A   2040A

NOM.INT.RATE_ER    -0.03   -0.03   -0.03   -0.03   -0.05   -0.07   -0.08   -0.10   -0.10   -0.08    0.01    0.01
REAL.INT.RATE_ER   -0.02   -0.02   -0.01   -0.00   -0.00   -0.01   -0.02   -0.04   -0.06   -0.10   -0.00   -0.00
INFL.GDP_ER        -0.06   -0.01   -0.02   -0.03   -0.04   -0.06   -0.07   -0.06   -0.05   -0.00    0.01    0.01
INFL.PC_ER         -0.03   -0.01   -0.02   -0.03   -0.04   -0.06   -0.07   -0.07   -0.05   -0.01    0.01    0.01
LABOUR.TAX.RATE_ER  0.00    0.00    0.00    0.00    0.00    0.00    0.00    0.00    0.00    0.00   -0.94   -0.93
GOV.DEBT.GDP_ER    -0.19   -0.72   -1.25   -1.78   -2.32   -2.86   -3.40   -3.94   -4.46   -4.96   -5.01   -5.00
GOV.BALANCE.GDP_ER  0.43    0.53    0.57    0.60    0.63    0.66    0.69    0.71    0.71    0.70    0.18    0.18
GOV.EXP.GDP_ER     -0.37   -0.44   -0.45   -0.46   -0.46   -0.46   -0.46   -0.45   -0.42   -0.40   -0.50   -0.49
GOV.REV.GDP_ER      0.04    0.05    0.06    0.06    0.06    0.06    0.06    0.05    0.05    0.05   -0.54   -0.53
TRADE.BAL.GDP_ER    0.08    0.06    0.05    0.05    0.05    0.05    0.04    0.04    0.04    0.03   -0.02   -0.02
CURRENT.ACC.GDP_ER  0.09    0.06    0.06    0.06    0.06    0.06    0.06    0.06    0.06    0.06    0.01    0.01
NFA.GDP_ER          0.06    0.12    0.18    0.24    0.30    0.35    0.41    0.46    0.52    0.57    0.55    0.52
```

Figure 4.11: Price mark-up reduction with alternative trade elasticities:

Small EMU member

Data Set by Archive - Percent Error

```
        TEMP_SIM_PCER

                            2011A   2012A   2013A   2014A   2015A   2016A   2017A   2018A   2019A   2020A   2030A   2040A

GDP.REAL_PCER               0.45    0.93    1.01    0.98    0.95    0.96    1.00    1.04    1.09    1.13    1.43    1.60
OUTPUT.T_PCER               1.32    2.37    2.56    2.52    2.47    2.47    2.50    2.55    2.60    2.66    3.03    3.26
OUTPUT.NT_PCER              0.39    0.97    1.16    1.16    1.14    1.14    1.17    1.20    1.24    1.27    1.51    1.63
CAPITAL.T_PCER              0.07    0.28    0.54    0.78    1.01    1.22    1.41    1.60    1.78    1.94    3.18    3.91
CAPITAL.NT_PCER             0.04    0.17    0.34    0.52    0.69    0.86    1.01    1.16    1.30    1.43    2.39    2.93
EMPLOYMENT_PCER             0.19    0.42    0.38    0.28    0.19    0.15    0.14    0.14    0.14    0.14    0.14    0.12
.EMPLOYMENT.T_PCER          0.29    0.55    0.51    0.39    0.31    0.27    0.25    0.26    0.26    0.27    0.27
.EMPLOYMENT.NT_PCER         0.05    0.21    0.19    0.10    0.02   -0.02   -0.03   -0.04   -0.04   -0.04   -0.07   -0.10
DEMAND.DOM_PCER             0.34    0.92    1.14    1.17    1.16    1.16    1.18    1.21    1.24    1.27    1.45    1.54
CONSUMPTION_PCER           -0.07    0.33    0.54    0.58    0.59    0.61    0.64    0.68    0.73    0.77    1.04    1.16
.CLC_PCER                   0.90    2.00    2.62    2.90    3.01    3.07    3.12    3.17    3.22    3.26    3.52    3.62
.CCC_PCER                   0.53    1.99    2.61    2.78    2.83    2.88    2.95    3.03    3.11    3.18    3.60    3.71
.CNLC_PCER                 -0.83   -1.28   -1.47   -1.60   -1.67   -1.69   -1.69   -1.66   -1.64   -1.61   -1.40   -1.27
INVESTMENT.CAPITAL_PCER     1.99    3.82    4.49    4.66    4.65    4.61    4.57    4.54    4.51    4.49    4.33    4.26
.INVESTMENT.T_PCER          1.85    3.32    3.75    3.82    3.82    3.83    3.87    3.91    3.96    4.01    4.38    4.61
.INVESTMENT.NT_PCER         2.11    4.20    5.06    5.30    5.28    5.19    5.10    5.01    4.93    4.85    4.29    4.00
INVESTMENT.HOUSE_PCER      -0.78   -0.52   -0.30   -0.26   -0.28   -0.30   -0.29   -0.26   -0.23   -0.20   -0.10   -0.13
GOVERNMENT.PURCHASES_PCER   0.00    0.00    0.00    0.00    0.00    0.00    0.00    0.00    0.00    0.00    0.00    0.00
EXPORTS_PCER                0.88    1.32    1.24    1.12    1.08    1.09    1.13    1.19    1.24    1.29    1.67    1.91
IMPORTS_PCER                0.05    0.60    1.01    1.18    1.21    1.19    1.16    1.13    1.10    1.07    0.85    0.70
REAL.WAGE_PCER              1.23    2.51    3.08    3.26    3.31    3.31    3.33    3.35    3.38    3.42    3.67    3.81
PRICE.LEVEL.GDP_PCER       -0.46   -0.62   -0.52   -0.41   -0.37   -0.37   -0.39   -0.42   -0.45   -0.47   -0.68   -0.80
.PRICE.LEVEL.T_PCER        -0.48   -0.74   -0.72   -0.66   -0.64   -0.64   -0.65   -0.68   -0.70   -0.72   -0.87   -0.96
.PRICE.LEVEL.NT_PCER       -0.32   -0.36   -0.22   -0.12   -0.07   -0.07   -0.08   -0.11   -0.13   -0.15   -0.32   -0.43
.PRICE.LEVEL.HOUSE_PCER    -0.51   -0.65   -0.61   -0.56   -0.54   -0.54   -0.54   -0.55   -0.55   -0.56   -0.60   -0.63
EXPORT.PRICES_PCER         -0.48   -0.74   -0.72   -0.66   -0.64   -0.64   -0.65   -0.68   -0.70   -0.72   -0.87   -0.96
IMPORT.PRICES_PCER         -0.01   -0.04   -0.06   -0.07   -0.07   -0.06   -0.06   -0.05   -0.05   -0.04    0.00    0.03
TOT_PCER                   -0.46   -0.70   -0.66   -0.60   -0.57   -0.58   -0.60   -0.62   -0.65   -0.68   -0.87   -0.99
REER_PCER                   0.46    0.60    0.47    0.35    0.31    0.31    0.34    0.38    0.41    0.44    0.70    0.86
EXR_PCER                   -0.01   -0.04   -0.07   -0.08   -0.08   -0.07   -0.07   -0.06   -0.06   -0.05   -0.01    0.02
```

Data Set by Archive - Error

```
        TEMP_SIM_ER

                    2011A   2012A   2013A   2014A   2015A   2016A   2017A   2018A   2019A   2020A   2030A   2040A
```

```
NOM.INT.RATE_ER          -0.04   -0.03   -0.01    0.00    0.01    0.01    0.01    0.01    0.01    0.01    0.00    0.00
REAL.INT.RATE_ER          0.35   -0.11   -0.13   -0.07   -0.01    0.02    0.03    0.04    0.03    0.03    0.02    0.01
INFL.GDP_ER              -0.62    0.02    0.13    0.08    0.02   -0.01   -0.03   -0.03   -0.03   -0.03   -0.02   -0.01
INFL.PC_ER              -0.42    0.05    0.12    0.07    0.02   -0.01   -0.02   -0.02   -0.02   -0.02   -0.01   -0.01
LABOUR.TAX.RATE_ER      -0.01   -0.14   -0.32   -0.46   -0.55   -0.61   -0.65   -0.68   -0.70   -0.73   -0.82   -0.83
GOV.DEBT.GDP_ER         -0.19   -0.65   -1.06   -1.28   -1.36   -1.37   -1.34   -1.30   -1.25   -1.20   -0.64   -0.29
GOV.BALANCE.GDP_ER       0.20    0.40    0.32    0.19    0.09    0.04    0.01   -0.00   -0.01   -0.01   -0.03   -0.01
GOV.EXP.GDP_ER          -0.18   -0.38   -0.39   -0.34   -0.30   -0.29   -0.30   -0.31   -0.32   -0.34   -0.43   -0.48
GOV.REV.GDP_ER           0.01   -0.02   -0.12   -0.21   -0.27   -0.31   -0.34   -0.37   -0.39   -0.40   -0.49   -0.51
TRADE.BAL.GDP_ER         0.11    0.00   -0.12   -0.19   -0.20   -0.20   -0.18   -0.16   -0.15   -0.14   -0.02    0.06
CURRENT.ACC.GDP_ER       0.11    0.01   -0.12   -0.19   -0.22   -0.22   -0.22   -0.21   -0.20   -0.20   -0.16   -0.12
NFA.GDP_ER               0.06    0.12    0.04   -0.13   -0.33   -0.55   -0.75   -0.95   -1.14   -1.32   -2.74   -3.58
```

Figure 4.12: Price mark-up reduction with different initial foreign positions:

Small EMU member

Data Set by Archive - Percent Error

TEMP_SIM_PCER

	2011A	2012A	2013A	2014A	2015A	2016A	2017A	2018A	2019A	2020A	2030A	2040A
GDP.REAL_PCER	-0.10	0.28	0.57	0.68	0.72	0.74	0.77	0.79	0.83	0.86	1.13	1.31
OUTPUT.T_PCER	0.67	1.66	2.16	2.34	2.39	2.40	2.41	2.43	2.46	2.49	2.71	2.85
OUTPUT.NT_PCER	-0.35	0.03	0.39	0.55	0.62	0.64	0.66	0.69	0.72	0.75	1.02	1.20
CAPITAL.T_PCER	0.04	0.17	0.36	0.56	0.76	0.94	1.11	1.27	1.42	1.56	2.61	3.22
CAPITAL.NT_PCER	0.01	0.07	0.17	0.28	0.39	0.50	0.61	0.71	0.81	0.91	1.64	2.11
EMPLOYMENT_PCER	-0.28	-0.13	0.05	0.10	0.09	0.07	0.05	0.05	0.05	0.05	0.08	0.11
.EMPLOYMENT.T_PCER	-0.17	0.06	0.25	0.29	0.28	0.25	0.23	0.23	0.23	0.23	0.25	0.27
.EMPLOYMENT.NT_PCER	-0.46	-0.41	-0.25	-0.19	-0.20	-0.21	-0.23	-0.23	-0.23	-0.22	-0.18	-0.15
DEMAND.DOM_PCER	-0.29	0.11	0.48	0.65	0.72	0.75	0.77	0.80	0.83	0.87	1.15	1.32
CONSUMPTION_PCER	-0.99	-1.00	-0.71	-0.55	-0.47	-0.43	-0.40	-0.36	-0.32	-0.28	0.07	0.29
.CLC_PCER	0.36	0.87	1.35	1.67	1.85	1.96	2.03	2.08	2.14	2.19	2.60	2.83
.CCC_PCER	-0.66	0.34	1.12	1.47	1.64	1.73	1.80	1.88	1.96	2.05	2.64	2.92
.CNLC_PCER	-1.84	-2.59	-2.64	-2.65	-2.69	-2.71	-2.72	-2.72	-2.72	-2.70	-2.60	-2.53
INVESTMENT.CAPITAL_PCER	0.78	1.92	2.64	2.98	3.12	3.17	3.19	3.20	3.22	3.24	3.39	3.50
.INVESTMENT.T_PCER	0.94	2.11	2.72	2.97	3.06	3.10	3.13	3.16	3.21	3.25	3.59	3.82
.INVESTMENT.NT_PCER	0.67	1.80	2.58	2.99	3.16	3.22	3.23	3.23	3.23	3.24	3.24	3.23
INVESTMENT.HOUSE_PCER	-1.86	-1.75	-1.26	-0.95	-0.80	-0.74	-0.70	-0.67	-0.63	-0.60	-0.41	-0.37
GOVERNMENT.PURCHASES_PCER	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EXPORTS_PCER	0.92	1.58	1.76	1.77	1.75	1.74	1.74	1.75	1.77	1.78	1.91	1.99
IMPORTS_PCER	-0.78	-0.76	-0.48	-0.28	-0.18	-0.14	-0.12	-0.11	-0.10	-0.08	0.00	0.05
REAL.WAGE_PCER	0.96	1.99	2.59	2.90	3.05	3.10	3.13	3.15	3.18	3.21	3.45	3.61
PRICE.LEVEL.GDP_PCER	-0.98	-1.73	-1.92	-1.92	-1.88	-1.85	-1.85	-1.85	-1.87	-1.88	-2.01	-2.10
.PRICE.LEVEL.T_PCER	-0.82	-1.51	-1.72	-1.75	-1.73	-1.72	-1.71	-1.72	-1.73	-1.75	-1.85	-1.92
.PRICE.LEVEL.NT_PCER	-0.79	-1.37	-1.48	-1.46	-1.41	-1.38	-1.37	-1.37	-1.38	-1.39	-1.47	-1.53
.PRICE.LEVEL.HOUSE_PCER	-1.77	-2.39	-2.46	-2.46	-2.44	-2.43	-2.42	-2.42	-2.42	-2.42	-2.42	-2.41
EXPORT.PRICES_PCER	-0.82	-1.51	-1.72	-1.75	-1.73	-1.72	-1.71	-1.72	-1.73	-1.75	-1.85	-1.92
IMPORT.PRICES_PCER	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.09	0.11	0.12
TOT_PCER	-0.90	-1.59	-1.80	-1.82	-1.80	-1.79	-1.79	-1.80	-1.82	-1.83	-1.96	-2.03
REER_PCER	1.08	1.87	2.06	2.06	2.01	1.99	1.98	1.99	2.01	2.03	2.18	2.28
EXR_PCER	0.14	0.11	0.08	0.07	0.07	0.08	0.08	0.08	0.08	0.09	0.11	0.11

Data Set by Archive - Error

TEMP_SIM_ER

	2011A	2012A	2013A	2014A	2015A	2016A	2017A	2018A	2019A	2020A	2030A	2040A
NOM.INT.RATE_ER	-0.03	-0.03	-0.01	-0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
REAL.INT.RATE_ER	1.08	0.29	0.02	-0.04	-0.03	-0.01	0.01	0.02	0.02	0.02	0.01	0.01
INFL.GDP_ER	-1.41	-0.46	-0.08	0.03	0.04	0.02	-0.00	-0.01	-0.02	-0.02	-0.01	-0.01
INFL.PC_ER	-1.06	-0.33	-0.04	0.04	0.04	0.02	0.00	-0.01	-0.01	-0.01	-0.01	-0.00
LABOUR.TAX.RATE_ER	0.13	0.28	0.26	0.18	0.11	0.04	-0.01	-0.05	-0.09	-0.12	-0.36	-0.49
GOV.DEBT.GDP_ER	0.33	0.51	0.31	0.07	-0.13	-0.28	-0.38	-0.45	-0.51	-0.55	-0.64	-0.49
GOV.BALANCE.GDP_ER	-0.18	0.04	0.18	0.16	0.12	0.09	0.07	0.06	0.05	0.01	-0.00	
GOV.EXP.GDP_ER	0.19	0.07	-0.06	-0.10	-0.11	-0.10	-0.10	-0.11	-0.12	-0.13	-0.21	-0.27
GOV.REV.GDP_ER	0.02	0.12	0.13	0.09	0.05	0.01	-0.03	-0.05	-0.07	-0.10	-0.23	-0.29
TRADE.BAL.GDP_ER	0.20	0.18	0.09	0.03	0.00	-0.00	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01
CURRENT.ACC.GDP_ER	0.19	0.17	0.08	0.03	-0.00	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01
NFA.GDP_ER	-0.45	-0.45	-0.27	-0.14	-0.08	-0.05	-0.04	-0.03	-0.03	-0.02	0.03	0.04