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## **Abstract\***

This paper analyzes the macroeconomic impact of China's 2009-2010 fiscal stimulus package by simulating a dynamic general equilibrium multi-country model of the world economy, showing that the effects on China's economic activity are sizeable: absent fiscal stimulus China's GDP would be 2.6 and 0.6 percentage points lower in 2009 and 2010, respectively. The effects are stronger under a US dollar peg because of the imported loose monetary policy stance from the United States. Higher Chinese aggregate demand stimulates higher (gross and net) imports from other regions, in particular from Japan and the rest of the world, and, only to a lesser extent, from the United States and the euro area. However, the overall GDP impact of the Chinese stimulus on the rest of the world is limited. These results warn that a fiscal policy-driven increase in China's domestic aggregate demand associated with a more flexible exchange rate regime have only a limited potential to contribute to an orderly resolution of global trade and financial imbalances.

**JEL Classifications:** E62; F41; F42; H30; H63

**Keywords:** Fiscal stimulus, Financial crisis

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## 1. Introduction

The global financial crisis and the ensued recession depressed aggregate demand worldwide. China, whose growth heavily relied on exports to the rest of the world in the previous several years, was particularly affected.<sup>1</sup>

China responded with one of the largest and most timely fiscal stimulus packages (IMF, 2010) aimed at sustaining domestic economic activity. In particular, beginning in 2009, fiscal authorities implemented a two-year fiscal stimulus of 3.1 and 2.7 percentage points of gross domestic product (GDP) in 2009 and 2010, respectively, mostly composed of increased investment (90 percent of the overall package) and some transfers to households.<sup>2</sup>

From a policy perspective, the analysis of the Chinese stimulus is interesting for several reasons.<sup>3</sup> First, this initiative represents an attempt at stimulating domestic activity as opposed to protecting export share in global markets, so it is interesting to quantify the effectiveness of that policy. Second, monetary and exchange rate policy may have affected the stimulus's impact on China and the rest of the world. Consequently, quantifying the impact of China's fiscal stimulus under alternative exchange rate and monetary regimes can shed light on the role of China's exchange rate regime in the so-called "global imbalances" and any prospective rebalancing of global growth. Third, China is now a large economy that affects the rest of the world significantly, including the United States and the euro area (Cesa-Bianchi et al., 2010). Again, quantifying the international spillovers from a relatively open economy such as China is as important as quantifying its domestic impact.

In this paper we quantitatively assess the macroeconomic impact of fiscal stimulus measures activated in China by simulating a dynamic general equilibrium multi-country model of the world economy. Specifically, we feed the 2009-2010 Chinese fiscal stimulus to the model and quantitatively analyze its domestic and spillover effects. Because of the structural nature of the model, we can also analyze the role of the composition of the fiscal package enacted, the role of the monetary and exchange rate regime, and the role of the degree of trade openness.

The model is new-Keynesian and calibrated to China, the United States, Japan, the euro area and the rest of the world.<sup>4</sup> In each region there is a monetary and a fiscal authority. The former controls the interest rate to stabilize domestic real activity and inflation or, in the case of China, to

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<sup>1</sup> As a matter of fact, according to available data from the National Bureau of Statistics of China, the contribution to growth stemming from net exports first slumped in 2008 to 0.8 percentage points (from an average contribution of 2.4 percent in the preceding three years), and then subtracted 4.2 percentage points from GDP growth in 2009.

<sup>2</sup> We consider the fiscal stimulus measures announced in China as reported in IMF (2010).

<sup>3</sup> For an analysis of the global fiscal stimulus in response to the crisis, see Freedman et al. (2009), IMF (2008) and Spilimbergo et al. (2008).

<sup>4</sup> The model is akin to the IMF GEM (Global Economy Model). See Pesenti (2008) for an exhaustive description of the GEM setup. See also Faruqee et al. (2007).

peg the nominal exchange rate against the US dollar. The fiscal authority manages public expenditure, which can be financed by raising (distortionary and lump-sum) taxes on local households and issuing public debt in the domestic financial market. Moreover, public expenditure can have Keynesian effects on private consumption, as a share of rule-of-thumb (ROT from now on) households in each period consumes all the available (wage) income.<sup>5</sup> A fiscal rule guarantees the stationarity of the public debt by appropriately changing one of the fiscal items included in the model. On the international side, the model includes all features commonly used in large-scale multi-country DSGE models to obtain a realistic international propagation of spillovers. In particular, the model distinguishes between tradables and nontradables, allows for asymmetric home bias and trade weights, and international price discrimination (the local currency pricing assumption holds). The model includes nominal wage and price stickiness as well as an indexation mechanism to have real and persistent effects of monetary policy. Finally, the presence of external habits in consumption and adjustment costs on investment and imports allows for sluggish and persistent responses of the real variables to a given shock.

In all scenarios we assume that US GDP growth is equal to -2.4 percent in 2009—in line with the data available at the time of writing—and that the US monetary authority immediately reduces the policy rate to 0.25 percent, a level that is held constant for 6 quarters (up to the first half of 2010).<sup>6</sup> On top of this baseline scenario, we initially simulate alternative scenarios for the different items (public investments and public transfers) included in China’s fiscal package. We then measure the macroeconomic effects of the overall Chinese fiscal stimulus package. Additionally, we also evaluate the related impact—both of the individual fiscal items and of the aggregate fiscal stimulus—under different assumptions about Chinese and US monetary and exchange rate policy.

The main results are as follows. First, government investments have larger macroeconomic effects than transfers to households. The reason is that government investment directly affects the aggregate demand, while (lump-sum) transfers stimulate demand through ROT households’ consumption, which depends not only on transfers but also on labor income.

Second, the macroeconomic effects of the fiscal measures are larger when the Chinese currency is pegged to the US dollar, because Chinese monetary policy is as expansionary as its US counterpart and households’ demand increases relatively more because of the ensuing reduction in the real interest rate. Given a shock to public investments equal to 1.0 percent of pre-shock GDP

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<sup>5</sup> We model the ROT households as in Galí, López-Salido and Vallés (2007). Kumhof and Laxton (2007) break the Ricardian equivalence by adopting an overlapping generation structure in a large-scale DSGE model.

<sup>6</sup> We do not consider issues related to the zero lower bound constraint of the US monetary policy. For an analysis of the implications for the United States of the zero lower bound in an open economy framework, see Bodenstein, Erceg and Guerrieri (2009).

level and lasting eight periods, the GDP increase is 1.1 percent and 0.5 percent in the first and the second year, respectively. When the same shock is applied to transfers, the increase in GDP is 0.9 (0.4) percent in the first (second) year. When the Chinese monetary authority follows a standard Taylor rule and stabilizes domestic inflation and real activity, the GDP increases by 0.4 (0.4) in the first (second year) in the case of public investments, and by 0.2 (0.4) in the case of transfers.

Third, the fiscal package announced in China is particularly effective in supporting economic activity, as it is based mainly on public investment and transfers instead of taxation. Its implementation implies an increase in Chinese GDP equal to 2.6 and 0.6 percent in the first and second year, respectively, and to 1.8 and 0.7 percent in the case of a standard Taylor rule.<sup>7</sup>

Fourth, spillovers to trade flows are not negligible. Compared to the baseline scenario, the fiscal package can induce an increase in Chinese (gross) imports equal to roughly 3.0 percent, while Chinese (gross) exports decrease by slightly more than 1.0 percent on average over the two years considered. The increase in Chinese imports is driven by the higher aggregate demand. Exports of Japan, and the rest of the world would benefit from the stimulus; to a lesser extent, those of the United States and the euro area, given that China's trade composition is mainly biased towards the former two regions. The rise in exports equals, on average, to 0.6 percent for Japan and the rest of the world, while it only amounts to 0.15 percent for the United States and the euro area.

Other recent contributions on this topic include Zhang and Zhang (2009), and He, Zhang, and Zhang (2009). Using the IMF's GIMF (Global Integrated Monetary Fiscal Model) Kumhof et al. (2010) find fiscal multipliers for China which are broadly in line with ours. In contrast to their work, we focus on the implications of different monetary regimes for the size of the fiscal multiplier and on the related trade spillovers.

The paper is organized as follows. The next section describes the model setup, and Section 3 describes the model calibration and the scenarios. Section 4 reports the results, and Section 5 concludes.

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<sup>7</sup> We do not consider shocks other than the fiscal ones that could have contributed to the growth rate in China in 2009. In particular, as highlighted among others by Yellen (2010), thanks to the restrictions imposed on capital inflows and outflows, the People's Bank of China has been able to maintain some insulation from foreign monetary policies. This has enabled the central bank to relax monetary and credit conditions throughout 2009, notwithstanding the recent peg to the US dollar, leading to an enormous lending boom, which we are not capturing in the model and that most likely contributed significantly to Chinese output growth in 2009.

## 2. Model Setup

We simulate a new-Keynesian multi-country DSGE model of the world economy, based on household and firm optimizing behavior and on nominal as well as real rigidities. Moreover, it is particularly rich in terms of fiscal features that allow us to analyze the macroeconomic impact of alternative fiscal measures and their interaction with monetary and exchange rate policy.<sup>8</sup>

In each regional bloc there are two types of household, Ricardian and non-Ricardian (ROT). The former type trades two short-term (one-period) riskless bonds to smooth consumption over time. One is denominated in domestic currency and is traded only domestically. The other is internationally traded, denominated in US dollars and issued in zero net supply worldwide.<sup>9</sup> Thus, an uncovered interest parity condition holds for Ricardian households outside the US economy. Ricardian households are the owner of domestic firms, and they also accumulate physical capital, which is rented out to domestic firms in a competitive market. Capital accumulation is subject to adjustment costs to increase the inertia and persistence in the response of investment to a given shock.

Ricardian households supply differentiated labor inputs to all domestic firms. The former act under monopolistic competition, so they set their real wage taking into account labor demand by firms and quadratic adjustment costs on nominal wages. The adjustment costs allow us to introduce nominal wage stickiness.

Non-Ricardian households neither have access to financial markets nor accumulate physical capital, so they cannot borrow against future income and in each period simply consume all current available income. The latter is equal to labor income net of distortionary and net lump-sum taxes. Each ROT household simply offers the same per capita amount of labor as each Ricardian household.

Households consume a basket of nontradable final goods. Ricardian households' consumption has an external habit component, to increase inertia in the consumption response to a given shock.

Firms produce two nontradable final goods (a consumption good and an investment good), a nontradable intermediate good and a tradable intermediate good, and they provide financial intermediation services. Perfectly competitive firms produce final goods by using all intermediate goods as inputs: nontradables, domestic tradables, and imported tradables. The baskets of imports are constant-elasticity-of-substitution (CES) aggregates of baskets of tradable goods from the other

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<sup>8</sup> The model is similar to the IMF GEM. For a complete description of GEM, see Pesenti (2008). For a thorough description of our model, see also Cova et al. (2008) and Cova, Pisani and Rebucci (2009).

<sup>9</sup> There are financial intermediation costs for accessing the international bond market that ensure determinacy of the steady-state net foreign asset distribution and model stationarity following temporary shocks.



four world regions. The final goods can be consumed or invested by households and the government. Imperfectly (i.e., monopolistic) competitive firms produce intermediate goods by using domestic labor and capital as inputs. Prices of intermediate goods are subject to adjustment costs, which give rise to nominal price rigidities. Nontradable intermediate goods are used directly in the production of final goods. Tradable intermediate goods are used in the production of domestic and foreign final goods.

For monetary policy, we assume a Taylor-type interest rate reaction function in which central banks set interest rates on the basis of the deviation of current inflation from the inflation target and output growth. A lagged dependent variable smoothes the response of policy interest rates to changes in these factors. For China, we assume that the monetary authority targets the exchange rate against the US dollar.

For fiscal policy, we assume that public expenditure can be targeted on government purchases or lump-sum transfers to domestic households.<sup>10</sup> Public expenditure can have Keynesian effects on aggregate consumption because of ROT households and can be financed by issuing public debt or taxes. Public debt is issued in the form of a one-period riskless bond denominated in domestic currency, and it is traded only with domestic Ricardian households. Taxes are levied on domestic households and can be distortionary (on labor income, capital income and consumption) or lump sum. Finally, a fiscal rule holds, such that (gross) lump-sum taxes are appropriately chosen to make the public debt stable.

### **3. Calibration and Scenarios**

#### ***3.1 Model Calibration***

The model is calibrated at quarterly frequency for five economic regions: China, the United States, the euro area, Japan, and the rest of the world. The specific values of the model parameters are chosen by relying on the existing literature, as well as on the empirical evidence gathered in previous IMF GEM work.<sup>11</sup> The model-based large ratios match actual data (the latter are reported in Table 1). The United States and the euro area are net debtors, while the other three blocs are net creditors in steady state. Tables 2 through 6 document the parameterization adopted for the five regional blocs.

All regions have a discount rate set to 0.997. The implied annual real interest rate is equal to 1.21. We assume a unitary elasticity of intertemporal substitution in consumption, so the utility

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<sup>10</sup> As we focus on the short-run impact of the fiscal stimulus, we do not consider possible supply-side effects of changes in the public investments. For a model with public investment affecting the potential output, see Kumhof and Laxton (2007).

<sup>11</sup> See Batini, N'Diaye and Rebucci (2005), Cova et al. (2008), Cova, Pisani and Rebucci (2009) and Hunt and Rebucci (2005).

function is logarithmic. For consumption habit persistence, we assume it is equal to 0.9. For labor, we assume a low Frisch elasticity of 0.5.

We further assume that in the China and rest of the world blocs the share of ROT households is 70 and 50 percent, respectively. It is lower in the euro area, the United States and Japan (40, 30 and 40 percent, respectively).

For the trade elasticities, we assume that the elasticity of substitution between domestically produced and imported tradable (consumption and investment) goods is equal to 2.5, consistent with existing estimates of import elasticities. The elasticity of substitution between tradables and nontradables is assumed to be 0.5.

In both the tradable and nontradable sectors, the elasticity of substitution between labor and capital is set to 0.75 . In China it is set to 0.99, in line with N'Diaye, Zhang and Zhang (2010). These elasticities and the bias towards the use of capital are calibrated to match regional historical (average) investment-to-GDP ratios. In all regions, the nontradable sector (e.g., services) is assumed to be less capital-intensive than the tradable sector (e.g., manufacturing). The depreciation rate is assumed to be 2.5 percent per quarter across all regions (10 percent per year).

The dynamics of the model are governed by the nominal and real rigidities described in Table 3. Consistently with empirical evidence, the price adjustment cost parameters are set to relatively high values for nontradables and wages, while tradable goods, in particular imported ones, are assumed to be relatively flexible. We assume that there is some indexation to previous period sector-specific inflation by setting the related parameter to 0.5. The adjustment cost parameter on investment is set to 3.5, in line with existing literature. The adjustment cost parameter on imports is set to 1 to replicate the typical sluggish reaction of import volumes to movements in relative prices. There are separate markups on tradable and nontradable goods as well as on labor services (Table 4). For markups, they are calibrated using values in line with estimates from Martins, Scarpetta, and Pilat (1996) and GEM literature. Similarly, we assume that households in the labor market have the same monopolistic power, yielding a 20 percent wage markup in all regions.

The parameterization of the reaction functions is shown in Table 5. The United States, Japan, the euro area, and the rest of the world all follow a standard Taylor rule. We assume a coefficient of 0.87 on the lagged short-term interest and a weight of 1.7 (0.10) on the gap between inflation and its target (on output growth). The inflation target is set to zero on a yearly basis, and it is kept constant in all simulations. We further assume that China pursues a fixed nominal exchange rate against the US dollar, so that the Chinese nominal interest rate follows the US one. Finally, we

assume that in all regions the fiscal authority sets gross lump-sum taxes to stabilize the public sector debt-to-GDP and deficit-to-GDP ratios.

Using the United Nations' Commodity Trade Statistics (COMTRADE) data for 2007 on each region's imports of consumption and investment goods, a disaggregated steady-state matrix delineating the pattern and the composition for all regions' exports and imports was derived. In particular, China's main trade partners are, in decreasing order of relevance, the rest of the world, Japan, the United States and the euro area. We match this matrix by calibrating the weights of nontradable and composite tradable in the final consumption and investment bundles (Table 2), as well as the weights of imports in the imported consumption and investment bundles (Table 6). In line with the literature, we assume that the composition of the public investment bundle is the same as that of the private investment bundle. The same is true for public and private consumption bundles. Consistently, the import content of public investment is higher than that of private consumption.

## **3.2 Scenarios**

### *3.2.1 Baseline Scenario*

Our baseline scenario is reported in Table 7. It consists of the following three features. First, we assume a reduction in the US aggregate demand and GDP by 2.4 percentage points in the first year (2009) and a recovery in subsequent years. The fall in demand is assumed to be brought about by a decline in private investment and consumption, consistently with the data. Second, we also assume that in the United States the (annualized) interest rate is reduced by the monetary authority to 0.25 percentage points in the first quarter of 2009 and held constant at that value for six quarters, until the second quarter of 2010. Third, we assume that the Chinese monetary authority implements a fixed exchange rate regime against the US dollar, so that the Chinese interest rate mimics the US one.

### *3.2.2 Counterfactuals*

On top of the baseline just described, we build alternative counterfactual scenarios to assess the macroeconomic impact of the Chinese fiscal stimulus package, mainly consisting of public investments and (gross lump-sum) transfers to households.<sup>12</sup> We initially show the macroeconomic

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<sup>12</sup> As mentioned in the introduction of the paper, by Chinese fiscal stimulus package we refer throughout the paper to the discretionary crisis-related fiscal measures for China for which we have updated data (see footnote 1). Consistently, we assume that public expenditure for consumption and distortionary tax rates are constant and equal to the corresponding steady state levels. Gross lump-sum taxes adjust to stabilize public debt through the fiscal rule, starting from the third year after the beginning of the stimulus.

effects of each fiscal item separately under different assumptions on monetary policy in China. Subsequently, we show the effects of the overall Chinese fiscal package. Based on IMF (2010), the package amounts to 3.1 and 2.7 percent of domestic GDP in 2009 and 2010, respectively, with public investments having a share equal to 90 percent in each year. All scenarios run under perfect foresight. As such, households and firms are surprised by the shocks only on impact, while they anticipate shocks perturbing the economy in subsequent periods.<sup>13</sup>

## 4. Results

### 4.1 Public Investments and Transfers Multipliers

Tables 8 and 9 report the macroeconomic effects of the two main items of the Chinese fiscal package, public sector investments and transfers to households when Chinese monetary policy follows a strict peg to the US dollar. Each measure has a size of 1 per cent of pre-shock GDP and lasts for eight quarters. We show results for domestic and trade-related economic variables.

Higher Chinese public sector investments induce a GDP growth equal to 0.5 per cent over the two years (see Table 8). Compared to the baseline scenario (Table 7), the GDP is higher in both 2009 (+1.1 percent vs. +0.6) and 2010 (+0.5 vs. +0.2). Higher public investment and sustained private demand contribute to the result. The crowding out of private demand due to higher public spending is muted, in particular in 2009, because of favorable monetary policy conditions. The Chinese monetary authority decreases the policy rate (in particular in 2009) because of the fixed exchange rate regime and expansionary US monetary policy.<sup>14</sup> Firms match higher aggregate demand by increasing employment and prices.

Regarding trade spillovers, because of the fixed exchange rate regime against the US dollar, the Chinese real effective exchange rate depreciates in the first year, while it appreciates in the second year. Compared to the baseline, the initial depreciation is lower, while the subsequent appreciation is higher, as the Chinese CPI inflation rate increases. The stronger increase in Chinese aggregate demand favors higher Chinese imports not only from the US, but also from other regions. The higher exports of other countries have a rather muted effect on their respective GDPs, as regions other than China are relatively closed and the share of tradables in total production is relatively small compared to that of nontradables.

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<sup>13</sup> All simulations run in Dynare. Dynare is a pre-processor and a collection of routines which solve non-linear models with forward-looking variables. For more information, see [www.dynare.org](http://www.dynare.org).

<sup>14</sup> Recall that interest rates in the United States are kept fixed at 0.25 basis points for six quarters, i.e., until the second quarter of 2010.

In the case of higher Chinese transfers to domestic households (Table 9), the macroeconomic impact is similar to that of public investments. Chinese GDP growth over the two years is 0.4 percent. Public sector transfers affect aggregate demand through higher consumption by ROT households, whose current available income increases not only because of higher transfers, but also because of higher wage income (associated with higher labor demand from firms). The increase in households' consumption induces firms to increase capital demand, so that in 2009 private investment increases to a greater extent than in the case of higher public investments (in 2010 it retrenches by less). The increase in imports is smaller than in the case of public investments. The reason is that the increase in aggregate demand is now mainly driven by households' consumption and the latter is more biased towards domestic (tradable and nontradable) goods than public and private investments.

To assess the role of monetary policy, Tables 10 and 11 report the effects of higher public investment and transfers under the assumption that monetary policy in China does not maintain the peg to the US dollar but follows a standard Taylor rule, which stabilizes domestic CPI inflation and real activity.<sup>15</sup> For public sector investments, GDP increases by 0.4 in 2009 and in 2010. For transfers to households, GDP increases by 0.2 percent in 2009 and 0.4 percent in 2010. So in 2009 both fiscal measures have much lower macroeconomic effects on GDP growth than under the fixed exchange rate regime. In 2010 results are reversed, as under the standard Taylor rule GDP growth is higher (compared to the fixed exchange rate regime). Moreover, the difference between the 2009 and 2010 values of the GDP growth rates is lower. The relatively more even growth under completely floating exchange rates is due to the time path of the real interest rate, which is smoother than under the peg regime, as can be seen by comparing Chinese short term real interest rates across Tables 8-11.<sup>16</sup>

The results suggest the relevance of the monetary policy regime for the impact of the fiscal stimulus. Under the fixed exchange rate regime, the Chinese interest rate diminishes in 2009 and increases in the second half of 2010, mimicking the path of the US interest rate. As such, there is a relatively large difference between the values of the real interest rate in 2009 and 2010. In 2009 Chinese monetary policy becomes relatively more expansionary than in 2010. Under the standard Taylor rule, instead, the Chinese interest rate follows a more even path, contributing to smooth

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<sup>15</sup> Consistently with assumptions on monetary policy in regions other than Asia, we impose a coefficient of 0.87 on the lagged short-term interest and a weight of 1.7 (0.10) on the gap between inflation and its target (on output growth).

<sup>16</sup> The size of the macroeconomic impact of the fiscal stimulus rises with the steepness of the yield curve, as agents' desire to front-load consumption and investment decisions increases the more real rates fall early on due to the fiscal expansion. Under floating exchange rates real interest rates move much less, as explained in the text, and as such the size of the impact is correspondingly lower.

growth and aggregate demand over time. The lower increase in aggregate demand in 2009 implies a lower impact on imports from other countries, even if the Chinese nominal and real exchange rate appreciation (due to the rise of Chinese interest rates) makes imports cheaper than domestic goods (the impact of the appreciation on import prices is not immediate, as we assume local currency pricing and hence incomplete short-run pass-through). As a consequence, the increase in other regions' exports to China decreases compared to the peg regime.

#### ***4.2 The Macroeconomic Impact of China's Fiscal Stimulus Package***

Table 12 shows the effects of the fiscal stimulus package under the fixed exchange rate regime. Results suggest that the fiscal stimulus in China can have a sizeable role in supporting domestic output growth. In 2009 the increase in Chinese GDP would be equal to 2.6 percent, and in 2010, to 0.6 percent. The increase is driven by private consumption (+3.2 and +1.1 percent in 2009 and 2010, respectively), that benefits from higher transfers to households and low real interest rates. Note that transfers to households are particularly effective in stimulating consumption, as, differently from other countries, the share of ROT households in China is relatively high (see Table 2). On the other hand, private investment decreases, as the crowding-out effect is now relatively large (consistently with the large size of the stimulus) and only partially compensated for by expansionary monetary policy. Compared to the baseline scenario (Table 7), higher Chinese aggregate demand implies higher inflation, and the appreciation of the Chinese real exchange rate (over the two years). It also implies larger Chinese import volumes (by 2.6 and 2.7 percentage points in 2009 and 2010, respectively). Exports by Japan and by the rest of the world benefit the most from higher Chinese aggregate demand.

To assess the role of the exchange rate regime for the effects of the fiscal package, we also report results in the case of Chinese monetary policy following a standard Taylor rule (Table 13). When the fiscal package is activated and both inflation and GDP increase in China, the monetary authority raises the nominal interest rate. As the real interest rate increases as well, private demand is now more muted. The GDP increases by 1.8 percent in 2009 and by 0.7 percent in 2010. In comparison to the fixed exchange rate regime, the lower expansionary effects on aggregate demand imply overall a lower increase in imports in 2009 and 2010, even though the Chinese real exchange rate appreciation makes imports cheaper than domestic goods through the standard substitution effect.

Finally, we further evaluate the contribution of expansionary policy by assuming that, given the fiscal stimulus, US and China (annualized) policy rates are held constant at the 0.25 percent level for eight periods (until the end of 2010) instead of six. In this scenario (Table 14), the increase

in Chinese GDP would be equal to 3.3 percent in 2009 and to 0.9 percent in 2010. As current and expected real interest rates are now lower, private investment positively reacts to the stimulus in 2009 (while the retrenchment in 2010 is weaker than when policy rates are held constant for six, instead of eight periods). The higher demand favors a relatively large increase in imports.

Overall, our results suggest that the macroeconomic effects of China's fiscal stimulus package are sizeable in the first year. The impact on other regions' exports to China can be positive and not negligible, given the relatively high import content of China's aggregate demand. The magnitude of the effects strongly depends on the monetary policy strategy adopted.

## **5. Conclusions**

The worldwide fall in economic activity triggered by the 2008 global financial crisis called for a strong and coordinated fiscal policy response to support aggregate demand. China implemented one of the largest and most timely fiscal stimulus packages. The model-based analysis that we performed shows that the Chinese fiscal stimulus was very effective in stimulating domestic demand, as its composition was biased towards public investments and monetary policy was appropriately loose. The overall impact of the package would have been smaller if it had been mostly focused on transfers to households and the exchange rate had been free floating. We also found that the package had a positive impact on international trade flows, because of the high import content of Chinese consumption and investment. However, the results warn that a fiscal policy-driven increase in China's domestic aggregate demand associated with a more flexible exchange rate regime has a limited potential to contribute to an orderly resolution of global trade and financial imbalances. As such, our results implicitly suggest that a multilateral approach is needed to the solution of the imbalances. In particular, the analysis of the crisis-related fiscal stimuli implemented in different regions of the world (particularly in the United States), their withdrawals and the related implications for international coordination remain extremely relevant for global imbalances. We leave these issues for future research.

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**Table 1. Steady-State National Accounts (in percent of GDP)**

	US	JA	CH	EA	ROW
Private consumption	64.26	56.84	40.61	58.95	54.46
Forward-looking consumers	51.07	43.00	28.04	43.37	37.56
Liquidity-constrained consumers	13.29	13.84	12.57	15.57	16.90
Private investment	18.47	19.65	38.63	15.88	17.59
Public expenditure	14.00	21.00	18.00	23.00	24.00
Consumption	11.00	18.00	15.00	21.00	20.00
Investment	3.00	3.00	3.00	2.00	4.00
Trade balance	0.18	-0.49	-0.24	0.17	-0.48
Imports	10.10	13.78	31.86	15.89	17.20
Consumption Goods	6.69	7.40	14.64	8.00	9.51
Investment Goods	3.39	6.38	17.22	7.87	7.69
Government debt	44.00	87.00	16.00	60.00	43.00
Net foreign assets	-14.50	41.00	20.00	-14.00	4.00
Share of World GDP (percent)	24.20	9.25	6.64	22.20	37.71

US=USA; JA=Japan; CH= China; EA= euro area; ROW=rest of the world

**Table 2. Households' and Firms' Behavior**

	US	JA	CH	EA	ROW
Rate of time preference	0.997	0.997	0.997	0.997	0.997
Depreciation rate	0.025	0.025	0.025	0.025	0.025
Intertemporal elasticity of substitution	1.00	1.00	1.00	1.00	1.00
Habit persistence in consumption	0.90	0.90	0.90	0.90	0.90
Inverse of the Frisch elasticity of labor	2.00	2.00	2.00	2.00	2.00
Share of liquidity-constrained consumers	0.30	0.40	0.70	0.40	0.50
<b>Tradable Intermediate Goods</b>					
Substitution between factors of production	0.75	0.75	0.99	0.75	0.75
Bias towards capital	0.60	0.70	0.60	0.60	0.60
<b>Nontradable Intermediate Goods</b>					
Substitution between factors of production	0.75	0.75	0.99	0.75	0.75
Bias towards capital	0.55	0.65	0.55	0.55	0.55
<b>Final consumption goods</b>					
Substitution between domestic and imported goods	2.50	2.50	2.50	2.50	2.50
Bias towards domestic goods	0.52	0.81	0.60	0.82	0.60
Substitution between tradables and nontradables	0.50	0.50	0.50	0.50	0.50
Bias towards tradable goods	0.50	0.45	0.51	0.40	0.45
<b>Final investment goods</b>					
Substitution between domestic and imported goods	2.50	2.50	2.50	2.50	2.50
Bias towards domestic goods	0.50	0.51	0.58	0.50	0.40
Substitution between tradables and nontradables	0.50	0.50	0.50	0.50	0.50
Bias towards tradable goods	0.85	0.55	0.75	0.75	0.75

**Table 3. Nominal and Real Rigidities**

	US	JA	CH	EA	ROW
<b>Nominal Rigidities</b>					
Wages	300	300	300	300	300
Price of domestically-produced tradables	250	250	250	250	250
Price of nontradables	500	500	500	500	500
Price of imported intermediate goods	150	150	150	150	150
Indexation to previous period inflation	0.5	0.5	0.5	0.5	0.5
<b>Real Rigidities</b>					
Investment adjustment costs	3.5	3.5	3.5	3.5	3.5
Import adjustment costs	1.0	1.0	1.0	1.0	1.0

**Table 4. Price and Wage Markups**

	US	JA	CH	EA	ROW
Tradables Price Markups	1.20	1.20	1.20	1.20	1.20
Nontradables Price Markups	1.30	1.30	1.30	1.30	1.30
Wage Markup	1.20	1.20	1.20	1.20	1.20

**Table 5. Monetary and Fiscal Policy**

	US	JA	CH	EA	ROW
<b>Monetary policy</b>					
Interest rate at t-1	0.87	0.87	0.00	0.87	0.87
Inflation	1.70	1.70	0.00	1.70	1.70
Output growth	0.10	0.10	0.00	0.10	0.10
Nominal Exch. Rate	0.00	0.00	1,000,000	0.00	0.00
<b>Fiscal policy</b>					
public debt-to-gdp	0.1	0.1	0.1	0.1	0.1
public deficit-to-gdp	5.1	5.1	5.1	5.1	5.1

**Table 6. International Linkages**

	US	JA	CH	EA	ROW
Substitution between consumption imports	2.5	2.5	2.5	2.5	2.5
Bias towards imported consumption goods from					
US	...	0.03	0.02	0.03	0.05
JA	0.10	...	0.22	0.06	0.10
CH	0.25	0.37	...	0.22	0.30
EA	0.20	0.16	0.14	...	0.55
ROW	0.45	0.44	0.62	0.69	...
Substitution between investment imports	2.5	2.5	2.5	2.5	2.5
Bias towards imported investment goods from					
US	...	0.04	0.02	0.03	0.06
JA	0.10	...	0.24	0.07	0.10
CH	0.25	0.31	...	0.24	0.30
EA	0.18	0.13	0.17	...	0.54
ROW	0.47	0.52	0.57	0.66	...
Net Foreign Liabilities					
Maximum of financial intermediation cost		0.0005	0.0005	0.0005	0.0005
Steepness of financial intermediation cost		0.0001	0.0001	0.0001	0.0001

**Table 7. Baseline Scenario**

Effects on:	CH		US		EA		JP		ROW	
	2009	2010	2009	2010	2009	2010	2009	2010	2009	2010
GDP growth (p.p.)	0.56	-0.38	-2.41	1.76	-0.13	0.20	-0.14	0.23	-0.36	0.53
GDP	0.56	0.18	-2.41	-0.69	-0.13	0.07	-0.14	0.09	-0.36	0.16
Consumption	1.21	0.45	-0.60	0.39	-0.08	0.04	-0.12	0.08	-0.31	0.22
Investment	1.29	0.30	-12.10	-5.91	0.23	0.33	0.22	0.32	0.46	0.64
Labor	1.13	0.21	-2.97	-0.09	-0.18	0.08	-0.20	0.11	-0.50	0.19
Inflation (yearly,p.p.)	0.30	0.22	-0.08	0.21	-0.03	-0.03	-0.03	-0.03	-0.07	-0.07
Export (volume)	-0.76	-0.12	0.51	0.73	-0.42	0.09	-0.49	-0.04	-0.90	-0.23
Import (volume)	1.10	0.35	-4.76	-1.64	0.11	0.22	0.09	0.23	0.08	0.39
Net Export (contr. to growth, p.p)	-0.61	-0.15	0.53	0.24	-0.09	-0.02	-0.08	-0.04	-0.17	-0.11
Real Eff. Exch. Rate (+=depr.)	0.76	-0.16	1.30	0.31	-0.44	-0.07	-0.80	-0.03	-0.58	-0.01
Current Account (%GDP, p.p.)	-0.46	-0.37	0.75	0.38	-0.01	0.11	-0.43	-0.41	-0.27	-0.14
Trade Balance (%GDP, p.p.)	-0.32	-0.18	0.64	0.27	-0.11	-0.02	-0.13	-0.03	-0.25	-0.10
Short term nom. interest rate (p.p.)	-0.96	-0.81	-0.96	-0.81	-0.02	-0.02	-0.01	-0.03	-0.03	-0.08
Short term real interest rate (p.p.)	-1.37	-0.67	-0.91	-1.44	0.03	-0.02	0.04	-0.04	0.08	-0.09
Long term nom, interest rate (p.p.)	0.01	0.11	0.01	0.11	0.00	0.01	0.00	0.00	0.00	0.01
Long term real interest rate (p.p.)	-0.11	0.00	-0.16	-0.04	0.00	0.00	0.00	0.00	-0.01	-0.01
Public deficit (%GDP, p.p)	0.13	-0.08	-0.67	-0.18	-0.05	0.01	-0.10	0.04	-0.15	0.12

*Note:* % deviation from steady state, unless otherwise stated; p.p.= deviation from steady state in % points.

**Table 8. Increase in Public Investment (Chinese Fixed Exchange Regime)**

Effects on:	CH		US		EA		JP		ROW	
	2009	2010	2009	2010	2009	2010	2009	2010	2009	2010
GDP growth (p.p.)	1.10	-0.61	-2.40	1.76	-0.12	0.20	-0.10	0.22	-0.32	0.52
GDP	1.10	0.48	-2.40	-0.69	-0.12	0.08	-0.10	0.12	-0.32	0.20
Consumption	1.24	0.55	-0.59	0.39	-0.08	0.03	-0.09	0.08	-0.27	0.23
Investment	0.58	-0.49	-12.11	-5.96	0.17	0.23	0.14	0.15	0.36	0.46
Labor	2.30	0.93	-2.95	-0.08	-0.16	0.10	-0.15	0.16	-0.43	0.25
Inflation (yearly, p.p.)	0.47	0.31	-0.08	0.23	-0.02	-0.02	-0.02	-0.01	-0.05	-0.04
Export (volume)	-0.99	-0.62	0.56	0.79	-0.37	0.15	-0.30	0.22	-0.75	-0.02
Import (volume)	1.86	1.46	-4.80	-1.74	0.07	0.12	0.04	0.11	0.04	0.29
Net Export (contr. to growth, p.p)	-0.94	-0.68	0.54	0.26	-0.07	0.00	-0.04	0.01	-0.14	-0.05
Real Eff. Exch. Rate (+=depr.)	0.62	-0.38	1.35	0.36	-0.42	-0.02	-0.75	0.06	-0.55	0.04
Current Account (%GDP, p.p.)	-0.85	-0.86	0.78	0.40	0.01	0.13	-0.40	-0.36	-0.24	-0.09
Trade Balance (%GDP, p.p.)	-0.70	-0.68	0.64	0.28	-0.09	0.00	-0.10	0.02	-0.21	-0.05
Short term nom. interest rate (p.p.)	-0.96	-0.81	-0.96	-0.81	-0.02	-0.01	-0.01	-0.01	-0.03	-0.05
Short term real interest rate (p.p.)	-1.47	-0.34	-0.93	-1.45	0.02	-0.02	0.02	-0.03	0.06	-0.07
Long term nom., interest rate (p.p.)	0.01	0.11	0.01	0.11	0.00	0.01	0.01	0.01	0.01	0.01
Long term real interest rate (p.p.)	-0.10	0.03	-0.16	-0.04	0.00	0.00	0.00	0.00	0.00	0.00
Public deficit (%GDP, p.p.)	0.77	0.81	-0.67	-0.18	-0.05	0.02	-0.07	0.07	-0.13	0.13

Note: % deviation from steady state, unless otherwise stated; p.p.= deviation from steady state in % points.

**Table 9. Increase in Public Transfers (Chinese Fixed Exchange Regime)**

Effects on:	CH		US		EA		JP		ROW	
	2009	2010	2009	2010	2009	2010	2009	2010	2009	2010
GDP growth (p.p.)	0.89	-0.47	-2.41	1.76	-0.13	0.20	-0.13	0.22	-0.34	0.52
GDP	0.89	0.41	-2.41	-0.69	-0.13	0.07	-0.13	0.10	-0.34	0.18
Consumption	2.59	2.05	-0.59	0.39	-0.08	0.03	-0.11	0.08	-0.29	0.22
Investment	0.88	-0.40	-12.10	-5.93	0.21	0.29	0.19	0.26	0.41	0.57
Labor	1.82	0.74	-2.96	-0.08	-0.17	0.08	-0.18	0.13	-0.46	0.22
Inflation (yearly, p.p.)	0.45	0.27	-0.08	0.22	-0.02	-0.03	-0.02	-0.02	-0.06	-0.06
Export (volume)	-0.91	-0.46	0.53	0.75	-0.41	0.10	-0.42	0.02	-0.84	-0.16
Import (volume)	1.39	0.65	-4.78	-1.69	0.09	0.18	0.06	0.17	0.06	0.33
Net Export (contr. to growth, p.p.)	-0.76	-0.36	0.54	0.25	-0.08	-0.01	-0.06	-0.02	-0.15	-0.08
Real Eff. Exch. Rate (+=depr.)	0.62	-0.35	1.33	0.34	-0.42	-0.04	-0.74	0.06	-0.55	0.04
Current Account (%GDP,p.p.)	-0.61	-0.56	0.76	0.39	0.00	0.11	-0.41	-0.39	-0.26	-0.12
Trade Balance (%GDP,p.p.)	-0.46	-0.38	0.64	0.27	-0.10	-0.01	-0.12	-0.02	-0.23	-0.08
Short term nom. interest rate (p.p.)	-0.96	-0.81	-0.96	-0.81	-0.02	-0.02	-0.01	-0.03	-0.03	-0.07
Short term real interest rate (p.p.)	-1.44	-0.38	-0.92	-1.45	0.02	-0.02	0.03	-0.03	0.07	-0.08
Long term nom, interest rate (p.p.)	0.01	0.11	0.01	0.11	0.00	0.01	0.00	0.01	0.00	0.01
Long term real interest rate (p.p.)	-0.10	0.02	-0.16	-0.04	0.00	0.00	0.00	0.00	-0.01	-0.01
Public deficit (%GDP, p.p)	0.73	0.75	-0.67	-0.18	-0.05	0.02	-0.09	0.05	-0.14	0.13

Note: % deviation from steady state, unless otherwise stated; p.p.= deviation from steady state in % points.

**Table 10. Increase in Public Investment (Floating Regime)**

Effects on:	CH		US		EA		JP		ROW	
	2009	2010	2009	2010	2009	2010	2009	2010	2009	2010
GDP growth (p.p.)	0.38	0.05	-2.41	1.77	-0.14	0.22	-0.15	0.27	-0.38	0.59
GDP	0.38	0.43	-2.41	-0.69	-0.14	0.08	-0.15	0.12	-0.38	0.22
Consumption	0.35	0.35	-0.60	0.39	-0.09	0.04	-0.12	0.09	-0.33	0.25
Investment	-0.51	-0.41	-12.11	-5.96	0.18	0.23	0.15	0.16	0.38	0.47
Labor	0.80	0.97	-2.97	-0.08	-0.19	0.10	-0.21	0.17	-0.51	0.27
Inflation (yearly, p.p.)	0.11	0.10	-0.08	0.22	-0.02	-0.03	-0.02	-0.02	-0.06	-0.05
Export (volume)	-1.01	-0.60	0.49	0.79	-0.44	0.16	-0.53	0.24	-0.95	-0.02
Import (volume)	0.98	1.46	-4.80	-1.73	0.07	0.13	0.03	0.13	0.02	0.30
Net Export (contr. to growth, p.p.)	-0.65	-0.68	0.53	0.26	-0.08	0.00	-0.07	0.01	-0.17	-0.06
Real Eff. Exch. Rate (+=depr.)	-0.52	-0.30	1.52	0.34	-0.27	-0.04	-0.23	0.02	-0.23	0.02
Current Account (%GDP, p.p.)	-0.92	-0.82	0.79	0.40	0.01	0.13	-0.39	-0.36	-0.23	-0.10
Trade Balance (%GDP, p.p.)	-0.77	-0.63	0.64	0.28	-0.09	0.00	-0.09	0.01	-0.20	-0.06
Short term nom. interest rate (p.p.)	0.06	0.11	-0.96	-0.81	-0.02	-0.02	-0.01	-0.02	-0.03	-0.06
Short term real interest rate (p.p.)	-0.02	0.36	-0.92	-1.45	0.02	-0.02	0.03	-0.05	0.07	-0.09
Long term nom., interest rate (p.p.)	0.02	0.02	0.01	0.11	0.00	0.01	0.01	0.01	0.01	0.01
Long term real interest rate (p.p.)	0.02	0.02	-0.16	-0.04	0.00	0.00	0.00	0.00	-0.01	-0.01
Public deficit (% GDP, p.p.)	0.97	0.99	-0.67	-0.18	-0.05	0.02	-0.08	0.06	-0.14	0.14

*Note:* % deviation from steady state, unless otherwise stated; p.p.= deviation from steady state in % points.



**Table 11. Increase in Public Transfers (Floating Regime)**

Effects on:	CH		US		EA		JP		ROW	
	2009	2010	2009	2010	2009	2010	2009	2010	2009	2010
GDP growth (p.p.)	0.19	0.18	-2.42	1.77	-0.15	0.22	-0.17	0.27	-0.40	0.60
GDP	0.19	0.37	-2.42	-0.69	-0.15	0.07	-0.17	0.10	-0.40	0.19
Consumption	1.72	1.85	-0.60	0.39	-0.09	0.04	-0.14	0.09	-0.35	0.24
Investment	-0.19	-0.32	-12.11	-5.93	0.22	0.30	0.21	0.28	0.43	0.57
Labor	0.36	0.78	-2.97	-0.09	-0.20	0.09	-0.24	0.13	-0.54	0.24
Inflation (yearly, p.p.)	0.10	0.06	-0.08	0.22	-0.03	-0.03	-0.03	-0.03	-0.07	-0.06
Export (volume)	-0.93	-0.44	0.46	0.75	-0.47	0.11	-0.65	0.04	-1.03	-0.16
Import (volume)	0.53	0.64	-4.78	-1.68	0.09	0.18	0.05	0.18	0.04	0.34
Net Export (contr. to growth, p.p.)	-0.48	-0.36	0.53	0.25	-0.09	-0.01	-0.09	-0.02	-0.18	-0.09
Real Eff. Exch. Rate (+=depr.)	-0.51	-0.26	1.50	0.32	-0.27	-0.05	-0.23	0.02	-0.23	0.02
Current Account (%GDP, p.p.)	-0.67	-0.51	0.76	0.39	0.00	0.11	-0.41	-0.40	-0.25	-0.13
Trade Balance (%GDP, p.p.)	-0.53	-0.33	0.64	0.27	-0.10	-0.01	-0.11	-0.02	-0.22	-0.09
Short term nom. interest rate (p.p.)	0.05	0.08	-0.96	-0.81	-0.02	-0.02	-0.01	-0.03	-0.03	-0.07
Short term real interest rate (p.p.)	0.01	0.30	-0.91	-1.44	0.03	-0.03	0.04	-0.05	0.08	-0.10
Long term nom, interest rate (p.p.)	0.01	0.01	0.01	0.11	0.00	0.01	0.00	0.01	0.00	0.01
Long term real interest rate (p.p.)	0.01	0.01	-0.16	-0.04	0.00	0.00	0.00	0.00	-0.01	-0.01
Public deficit (%GDP, p.p.)	0.92	0.93	-0.67	-0.18	-0.05	0.01	-0.09	0.05	-0.15	0.13

Note: % deviation from steady state, unless otherwise stated; p.p.= deviation from steady state in % points.

**Table 12. Fiscal Stimulus Package (Chinese Fixed Exchange Regime)**

Effects on:	CH		US		EA		JP		ROW	
	2009	2010	2009	2010	2009	2010	2009	2010	2009	2010
GDP growth (p.p.)	2.62	-1.94	-2.37	1.74	-0.09	0.17	0.00	0.13	-0.17	0.40
GDP	2.62	0.64	-2.37	-0.67	-0.09	0.08	0.00	0.14	-0.17	0.22
Consumption	3.21	1.07	-0.57	0.40	-0.06	0.02	-0.02	0.07	-0.16	0.20
Investment	-1.05	-2.25	-12.14	-6.06	0.06	0.04	-0.04	-0.14	0.16	0.14
Labor	5.67	1.42	-2.91	-0.06	-0.11	0.11	0.01	0.20	-0.23	0.29
Inflation (yearly, p.p.)	0.98	0.33	-0.06	0.27	-0.01	0.00	0.01	0.04	-0.02	0.00
Export (volume)	-1.54	-1.67	0.68	0.86	-0.24	0.22	0.16	0.59	-0.37	0.27
Import (volume)	3.70	3.11	-4.88	-1.93	-0.03	-0.05	-0.06	-0.12	-0.04	0.06
Net Export (contr. to growth, p.p.)	-1.72	-1.57	0.56	0.28	-0.03	0.04	0.03	0.10	-0.06	0.04
Real Eff. Exch. Rate (+=depr.)	0.18	-0.81	1.48	0.47	-0.34	0.07	-0.57	0.24	-0.46	0.13
Current Account (%GDP, p.p.)	-1.74	-1.64	0.86	0.42	0.04	0.16	-0.32	-0.28	-0.17	0.00
Trade Balance (%GDP, p.p.)	-1.59	-1.45	0.66	0.30	-0.06	0.03	-0.02	0.10	-0.14	0.04
Short term nom. interest rate (p.p.)	-0.96	-0.80	-0.96	-0.80	-0.01	0.00	0.00	0.03	-0.01	-0.01
Short term real interest rate (p.p.)	-1.62	0.42	-0.97	-1.47	0.00	-0.01	-0.03	0.00	0.01	-0.03
Long term nom., interest rate (p.p.)	0.02	0.12	0.02	0.12	0.01	0.01	0.01	0.01	0.01	0.02
Long term real interest rate (p.p.)	-0.04	0.09	-0.16	-0.04	0.00	0.00	0.00	0.01	0.00	0.00
Public deficit (%GDP, p.p.)	2.63	2.48	-0.66	-0.17	-0.03	0.03	-0.01	0.10	-0.07	0.13

Note: % deviation from steady state, unless otherwise stated; p.p.= deviation from steady state in % points.

**Table 13. Fiscal Stimulus Package (Floating Regime)**

Effects on:	CH		US		EA		JP		ROW	
	2009	2010	2009	2010	2009	2010	2009	2010	2009	2010
GDP growth (p.p.)	1.83	-1.16	-2.38	1.75	-0.10	0.19	-0.05	0.19	-0.24	0.48
GDP	1.83	0.65	-2.38	-0.67	-0.10	0.08	-0.05	0.15	-0.24	0.24
Consumption	2.21	0.92	-0.58	0.39	-0.07	0.03	-0.05	0.08	-0.21	0.23
Investment	-2.22	-1.98	-12.14	-6.06	0.07	0.03	-0.02	-0.14	0.17	0.13
Labor	3.99	1.60	-2.93	-0.06	-0.14	0.11	-0.07	0.21	-0.33	0.32
Inflation (yearly, p.p.)	0.61	0.22	-0.06	0.26	-0.01	0.00	0.01	0.03	-0.03	0.00
Export (volume)	-1.57	-1.68	0.60	0.87	-0.31	0.24	-0.09	0.63	-0.58	0.30
Import (volume)	2.73	3.24	-4.89	-1.93	-0.03	-0.05	-0.08	-0.12	-0.07	0.06
Net Export (contr. to growth, p.p.)	-1.41	-1.61	0.55	0.28	-0.05	0.05	0.00	0.10	-0.09	0.04
Real Eff. Exch. Rate (+=depr.)	-1.10	-0.66	1.67	0.44	-0.17	0.04	0.02	0.17	-0.10	0.09
Current Account (%GDP, p.p.)	-1.83	-1.61	0.86	0.42	0.04	0.16	-0.31	-0.28	-0.15	-0.01
Trade Balance (%GDP, p.p.)	-1.68	-1.42	0.66	0.30	-0.06	0.04	-0.02	0.09	-0.12	0.03
Short term nom. interest rate (p.p.)	0.30	0.44	-0.96	-0.80	-0.02	0.00	0.00	0.02	-0.01	-0.02
Short term real interest rate (p.p.)	0.04	1.28	-0.96	-1.47	0.00	-0.01	-0.02	-0.01	0.02	-0.05
Long term nom., interest rate (p.p.)	0.07	0.03	0.02	0.12	0.01	0.01	0.01	0.01	0.01	0.02
Long term real interest rate (p.p.)	0.09	0.07	-0.16	-0.04	0.00	0.00	0.00	0.01	0.00	0.00
Public deficit (% GDP, p.p.)	2.89	2.74	-0.66	-0.17	-0.04	0.03	-0.02	0.10	-0.09	0.14

Note: % deviation from steady state, unless otherwise stated; p.p.= deviation from steady state in % points.

**Table 14. Fiscal Stimulus Package (Peg Regime, Expansionary US Monetary Policy for Eight Quarters)**

Effects on:	CH		US		EA		JP		ROW	
	2009	2010	2009	2010	2009	2010	2009	2010	2009	2010
GDP growth (p.p.)	3.33	-2.32	-2.32	2.04	-0.09	0.18	0.02	0.13	-0.16	0.42
GDP	3.33	0.93	-2.32	-0.32	-0.09	0.09	0.02	0.15	-0.16	0.26
Consumption	4.14	1.56	-0.25	1.00	-0.07	0.03	-0.01	0.08	-0.15	0.23
Investment	0.23	-1.64	-13.43	-6.62	0.06	0.02	-0.06	-0.19	0.17	0.12
Labor	7.16	1.84	-2.80	0.54	-0.12	0.12	0.03	0.23	-0.22	0.34
Inflation (yearly, p.p.)	1.48	1.12	0.21	1.09	-0.01	0.00	0.01	0.05	-0.03	0.01
Export (volume)	-1.66	-1.86	0.89	0.99	-0.21	0.27	0.36	0.71	-0.24	0.37
Import (volume)	4.71	3.61	-5.24	-1.93	-0.03	-0.08	-0.06	-0.16	-0.02	0.06
Net Export (contr. to growth, p.p.)	-2.09	-1.79	0.62	0.30	-0.03	0.06	0.06	0.12	-0.04	0.05
Real Eff. Exch. Rate (+=depr.)	0.90	-0.71	2.55	0.81	-0.69	-0.02	-1.27	0.07	-0.98	0.00
Current Account (%GDP,p.p.)	-1.83	-1.81	1.01	0.46	0.03	0.17	-0.35	-0.29	-0.22	0.00
Trade Balance (%GDP, p.p.)	-1.68	-1.61	0.81	0.34	-0.08	0.04	-0.05	0.11	-0.19	0.04
Short- term nom. interest rate (p.p.)	-0.96	-0.96	-0.96	-0.96	-0.02	0.01	0.00	0.03	-0.01	-0.01
Short-term real interest rate (p.p.)	-2.50	-0.21	-1.66	-2.45	0.00	-0.01	-0.04	0.01	0.00	-0.03
Long-term nom. interest rate (p.p.)	0.05	0.16	0.05	0.15	0.01	0.01	0.02	0.02	0.02	0.02
Long-term real interest rate (p.p.)	-0.14	0.07	-0.28	-0.07	0.00	0.00	0.01	0.01	0.00	0.01
Public deficit (%GDP, p.p)	2.54	2.42	-0.59	0.00	-0.04	0.04	-0.03	0.12	-0.09	0.15

*Note:* % deviation from steady state, unless otherwise stated; p.p.= deviation from steady state in % points.