BALANCING THE EUROPEAN MONETARY UNION
AN IMPACT ANALYSIS ON THE RETURN OF NATIONAL CURRENCIES

Anke Mönnig
Institute for Economic Structures Research (GWS), Heinrichstr. 30, 49080 Osnabrück
moennig @ gws-os.com

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"Imagine the return of the DM is preposterous"
Ulrich Kater, Dekabank [author's translation]

1 INTRODUCTION

Whether projected or neglected, the pure existing of the debate of the survival of the Euro is evidence enough, that the situation is serious. Just recently, Paul Krugman has restated the question whether Europe is not better off without the Euro (Krugman 2012). The current budget crisis prevailing in the European Monetary Union (EMU) and the stumbling efforts of the leading politicians to reconstruct the economic stability in the Eurozone has surfaced arguments that speak in favour of an introduction of national currencies. Apart from national resentments towards the Euro, in the case of Greece, a member of the Eurozone-club was at the edge of being thrown out of the Union due to budgetary misbehaviour. The longer the crises prevail, the stronger might become the arguments for a break-up of the EMU – whether unilateral or in total – with each country having individual motives to do so.

From an economic point of view, leaving the EMU makes sense when the advantages of being a member do no more exceed the disadvantages. This paper tries to investigate for the case of Germany, whether or not a return to a new DM (NDM) would be beneficial.

The quantitative results of the computed projection shows, that a return to a national currency would lower Germany's growth path mainly due to the expected appreciation of the new currency. A second scenario, which assumes a worsening of the crisis within the remaining EMU would intensify the negative implications for Germany. Although the results should be considered with respect to their strong assumptions, consensus among economist exists that these assumptions might be initiated in case of a EMU break-up. Hence, in the case of Germany, the effort of doing everything to foster the future existing of the monetary union is of utmost importance.

2 THE EUROZONE – AN OPTIMAL CURRENCY AREA?

In January 1999, the "revolution for Europe" (Roth 2004: 1) was institutionalized by the creation of the European Monetary Union, and the introduction of a single currency three years later. The objective to remove national currencies was politically motivated, but it did also have economic reasons -- with an increase in transparency and comparability it was thought to foster trade, investments and growth within the EMU and to create a more stable monetary environment.

The current sovereign debt crisis has let to the return of the discussion whether the Eurozone represents an optimal currency area (OCA). The OCA was formulated by Mundell (1961) in order to demonstrate alternative solutions to overcome international disequilibrium systems. Until then, it was common sense to prioritise flexible exchange rate systems over fixed exchange rate system because they could function as a balancing device against domestic wage and price rigidities. Mundell (1961) doubted that all economies should flow their exchange rate and hence asked for "the appropriate domain of a currency area" (Mundell 1961: 657).

According to his work, a currency area is defined by its degree of price and wage flexibility. If **prices and wages** are **flexible** enough to outbalance external shocks, the exchange rate as a stabilising instrument could be outsourced (Tomann 2001). In a currency union, a negative external shock would be balanced by a decline in real wages. A fall in real wages would improve international competitiveness. Domestic products could be produced and sold on international markets at lower prices. The negative implication from the real wage decreases on private consumption would be compensated by higher production. Real wages would function as a quasi-exchange rate instrument. If flexible wage alterations are only possible to a limited extent, high **factor mobility** would be an alternative to adapt to external negative shocks. Based on the work of Mundell (1961), the theory on OCA was further developed. As McKennon (1963) has outlined, flexible real wage adaptation can be only a successful instrument for combating external shocks if the **degree of openness** of a country is sufficiently high. Otherwise, the cost benefits arising from lower production costs would have no implications. Also, as Sievert (1993) outlined, observed wage and price rigidities that would not allow a country's entry into a single currency area, could be disbanded because this country is entering a monetary union. This can be the case, if the monetary policy institution holds strong **credibility in maintaining price stability**. A similar argument was put forward by Frankel and Rose (1998), who argued that the criteria themselves are endogenous and are being altered in the moment a currency union is established. Kenen (1969) introduced a coordinated fiscal policy as a further criterion that favours OCA and that can offset the disadvantage of rigid labour markets. In such a not-optimal Mundellian situation, a single **fiscal policy** can act as a "shock absorber" (Tomann 2001: 283). Fiscal policy could react on negative shocks by e.g. lowering tax payments that could help to stabilize disposable income and, hence, overall production. Kenen (1969) also defined **product-diversity** as a positive sign of a country to enter a currency union. It is argued that shock might diversify among different products and industries, and the larger the number of potentially shock-exposed industries, the lower the risk of a deep negative implication for the domestic economy. **Correlation of business cycles** and **similarities of shocks** are two further important criteria to prevent the need for country-specific adjustment policies. Last, the **size of the currency area** matters as well: the currency area "becomes more optimal when it increases in size" (Bogdan 2009: 125).

An application of the analytical framework of OCA to the EMU is not subject to this paper, but some authors (De Lucia 2011, Geza & Giurca Vasilescu 2011, Kotil et al. 2009) have tested the current configuration of the EMU. De Lucia (2011) for instance has found "that only the founding countries of the EEC *(European Economic Community)* plus Austria fulfil this criterion (De Lucia 2011: 12). And Geza & Giurca Vasilescu (2011) identifies the EMU as a "sub-optimum currency area" (Geza & Giurca Vasilescu 2011: 7). Accordingly, the question to whether the EMU represents an OCA has to be – in strict interpretation of the criteria – neglected. Thus, a reversal of the European "unification process" could be justified.

3 BREAKING-UP THE EURO

According to the previous chapter, the sub-optimal characteristics of the Eurozone as an OCA might give arguments for initiating a break-up of the Eurozone. This chapter aims to disclose strategies for exiting the EMU. Before, a short revisit of the official path towards the Euro is given.

3.1 REVISITED: THE OFFICIAL PATH TOWARDS THE EURO

Whereas two countries of the founding members of the European Union has obtained an opt-out-clause for entering the European Monetary Union, the "official path to the Euro" (Belke & Hebler 2003) does not encounter for this.[1] The entrance to the European Union leads consequently for all candidate countries into the EMU. In the time prior to the European Union, the choice of the exchange rate regime is open but the accession criteria to the European Union, also referred to as the Copenhagen criteria, are to be matched at the end.

Tab. 1: Copenhagen criteria

1	stable institutions that guarantee democracy, the rule of law, human rights and respect for and protection of minorities
2	a functioning market economy, as well as the ability to cope with the pressure of competition and the market forces at work inside the Union
3	the ability to assume the obligations of membership, in particular adherence to the objectives of political, economic and monetary union

Source: http://ec.europa.eu

After the eligibility criteria to the EU are obtained and a country has entered the EU, no fix timetable is given for the entrance into the EMU. But they have to take part at the exchange rate mechanism 2. A country has to align its exchange rate to a minimum of 2 years on a fluctuation margin of 30% (+/- 15%) to the Euro. Also, the Euro convergence criteria, also known as the Maastricht criteria, have to be matched prior to accession. The only way to prevent the entering to EMU is to constantly expulse against the convergence criteria.

Tab. 2: Maastricht criteria

1	Price stability	The inflation rate should be no more than 1.5 percentage points above the rate for the three EU countries with the lowest inflation over the previous year
2	Budget deficit	This must generally be below 3% of gross domestic product (GDP)
3	Debt	The national debt should not exceed 60% of GDP, but a country with a

[1] Only Great Britain and Denmark have received an opt-out-clause.

		higher level of debt can still adopt the euro provided its debt level are falling steadily
4	Interest rates	The long-term rate should be no more than two percentage points above the rate in the three EU countries with the lowest inflation over the previous year
5	Exchange rate stability	The national currency's exchange rate should have stayed within certain pre-set margins of fluctuation for two years

Source: http://europa.eu

3.2 EXITING THE EURO

The literature of costs and benefits of leaving monetary unions is not new (DeGrauwe 1997, Gros & Thygesen 1998) and accompanied the EMU from scratch (Strobel 2005, Brown 2004a, Cornelius & Trimbur 2000, Scott 1998). But the Treaty of the European Union (the "Maastricht treaty") does not stipulate a withdrawal, dismissal or exclusion of a member state (Herdegen 1998). Once entered the EMU, the membership is expected to be permanent and irreversible. But, "in a world of sovereign states… nothing can be regarded as truly irreversible" (Cohen 2000: 2). A serious violation of the Treaty would justify an exclusion (Herdegen 1998).

Independent to whether the break-up is the result of a consensus, unilateral or forced decision (Herdegen 1998), the challenge is, that "no continuity of contract rules for exiting EMU" (Scott 1998: 207) exists. But the outcome of a break-up may depend on some exogenous factors listed in the following.

Tab. 3: Factors for defining EMU break-up

1	Coopartive or non-cooperative The introduction of a new "old" currency depends to whether a smooth collective action among all member states of the EMU is possible. (Small) countries, that unilaterally whish to exit the EMU would face the problem of unofficial Euroization and, hence, the problem for not having the control over money supply. Cooperation with the remaining EMU would help to solve this problem, by for instance introducing a "new" Euro simultaneously to the new old national currency (Scott 1998)
2	Sudden or phased A phased exit strategy could look alike the three staged process towards the Euro. This could take several years but would most likely prevent economic disruption. In case of immediate action, a sudden exit strategy had to be the choice and it "would create windfall losses or gains" (Brown 2004b: 59).
3	Reason for leaving: frustration or economic stress hypotheses The motivation for exiting the EMU can differ considerably and can be pinpoint to two hypotheses: the frustration and economic stress hypothesise (Herdegen 1998) The frustration hypotheses justifies the exit of the EMU because of a constant breach of the stability criteria formulated in the stability and growth pact by other member countries. In contrary, the economic stress hypothesis describes an exit motive because a country cannot fulfil the stability criteria but is compelled to do so. (Eichengreen 2007, Meyer 2009, Herdegen 1998)

4	"Weak" or "strong" economy The effects of leaving the EMU depend strongly on the economic strength of the county wishing to exit. A comparatively weak country is most likely to be expulsed more heavily to negative implications than a comparatively strong country (Boonstra 2010, Scott 1998).
5	Unilateral or complete break-up A unilateral or complete break-up has considerably effects on the scope and scale of the expected economic effects on all countries (Scott 1998, Zeddies 2011, Cliffe 2010).

3.3 TRANSMISSION CHANNEL

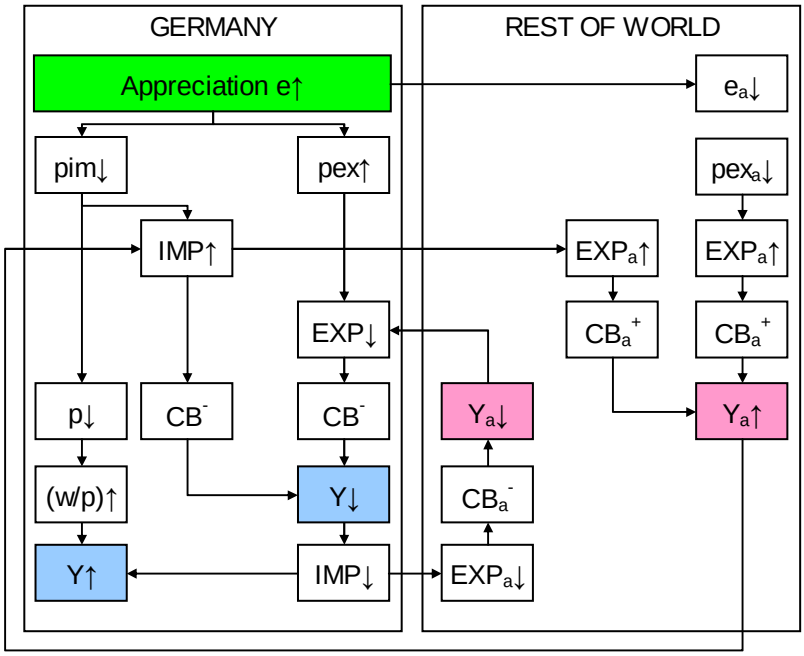
A break-up of the EMU would have considerable effects first and foremost on the exchange rate. The country that has decided upon leaving the EMU would reintroduce its new "old" currency. A price for this currency, the exchange rate, would have to be established. In a flexible system of exchange rate currencies, this price would be bargained on money markets.

In the following, the transmission channel of an exogenous exchange rate alteration is discussed using the example of Germany that introduces a new currency (NDM). It is assumed that Germany, a comparatively strong economy, decides to leave unilaterally the EMU driven by the frustration hypothesis. The exchange rate of NDM towards the remaining Euro would appreciate strongly (KfW 2011, Boonstra 2010, Zeddies 2011, Meyer 2009). This assumption rests on the idea, that investors would be unsure about the future sustainability of the remaining EMU and, hence, would tend to re-sort their portfolio towards a more stable currency – the NDM. This assumption is not far fledged when looking back to what occurred to the Swiss franc during the peak of the Euro crises in fall 2011. The Swiss franc appreciated from April until August 2011 by 40%, alone 20% during July and August 2011 (Kfw 2011).

As can be seen in Graph 1, an appreciation of the NDM would have immediate price effects on import prices and export prices in Germany. The appreciation of the new currency would lower import prices and more goods could be imported. Decreasing import prices would also lower inflaton pressures, leading to a decline in domestic prices which would lead to an increase in real wages. This string in argument would lead to an empowering of domestic demand and, hence, to a positive impulse on overall production. At the same time, increasing import demand would shorten the trade balance which has a lowering impact on overall production. This negative effect on production would be fostered due to the negative implication of the currency appreciation on domestic exports. Increasing export prices would lower the foreign demand for German export goods. The decline in domestic production again would imply lower demand and lower demand for import goods.

The single effects outlined for the country leaving the EMU, would also effect the countries in the rest of the world. All things being equal, the currency appreciation of the NDM implies a depreciation of the currency of all other countries. The effects would be exactly the same as in the appreciating country but with opposite signs. Above that, the trade channel strengthan or weaken the effects in the countries.

Graph 1: Exchange rate transmission channel



Source : own drawing

The outlined transmission channel only holds with uncertainty.

Tab. 4: Uncertainties of the transmission channel

1	Expectations and behavioural changes might change and the exchange rate might develop different than expected.
2	The influence of the exchange rate depends how strong the influence of import and export is on domestic demand. If the price elasticity of export and import goods is low, the price influence is rather high. This is for instance the case for crude oil. At least in the short run, if no substitutable products are available, domestic prices are strongly affected.
3	The ratio between export and import prices is called the terms of trade. They determine whether the effects arising from the decline in export prices exceeds the effects results from decreasing import prices.
4	The reaction of domestic or foreign central banks is not encountered. If the foreign central bank decides upon increasing interest rates, the outflow of capital could be prevented.

4 Quantifying the Return of National Currencies

4.1 Review on Literature

As seen in the previous chapter, the transmission channel is rather complex, leads to opposite effects on total production and is subject to uncertainties. Still, some research has been conducted to quantify the effects of a break-up of the Eurozone. The following table lists some of the results.

Tab. 5: Summary of literature review

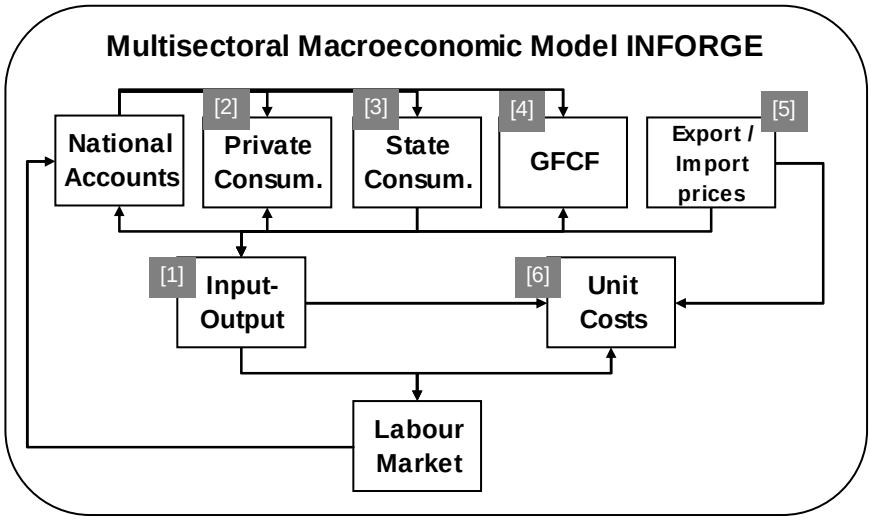
	Scenario	Effects
KfW (2011)	Unilateral break-up Germany	• -2.3%-points of German real GDP growth • -50 to -60 bn Euro to German nominal GDP within two years
Cliffe (2010)	Total EMU break-up	• -4.0%-points of German GDP growth in 2011 • -10%-points of German cumulative GDP growth within three years
Boonstra (2010)	Total EMU break-up	• -8% of German total GDP; equals 200 bn Euro of German nominal GDP in one year
IMK (2011)	Total EMU break-up	• -1.4%-points of German real GDP growth in one year
Zeddies (2011)	Total EMU break-up	• -75 bn Euro of German exports within nine years

The approaches vary considerably in terms of applied methodology, assumption on exchange rate appreciation, considered time horizon and break-up scenario. Consequently, the quantitative effects on GDP differ. The overall conclusion of all reviewed publication remains the same: a break-up of the Eurozone has negative implications for all member countries.

4.2 APPLIED METHODOLOGY

In this paper a macro-econometric simulation model for analysing fiscal policy shocks has been chosen. INFORGE (INterindustry FORecasting GErmany) has been developed by the Institute for Economic Structures Research (GWS) and is a multisectoral macroeconomic forecasting and simulation model for Germany. It belongs to the INFORUM modelling family (Almon 1991) with their two main features: bottom-up and total integration. It uses regression analysis to describe economic behaviour of different economic agents. Interindustry relations are explicitly used and change over time. Accounting consistency is assured at all time; on the production side as well as on the demand side. The bottom-up approach is characterized by a deep disaggregation on the sectoral level, enabling a detailed modelling of industries and goods. The integrated structure of the model allows a complex and simultaneous solution due to the absolute accounting consistency. Input-output tables are fully implemented in the system of national accounts allowing linkages between interindustry interdependencies, distribution of income, redistribution effects of the state and spending of income on goods. Production is determined by demand via the Leontief-equation. All determinants of demand depend on relative prices which again are a function of firm's unit costs and import prices. (Ahlert et al 2009). In Figure 1 a graphical specification with the major driving forces of INFORGE is given

Figure 1: Graphical specification of INFORGE



INFORGE corresponds in many features to standard CGE models (Almon 1991). Similar to them, it solves simultaneously and is dynamic over time. The basic dataset (input-output-tables and national accounts) as well as the non-linear functions coincide. Differences to other CGE-like modelling approaches are situated in the theoretical foundation of the model. CGE-models concentrate on equilibrium positions (West 1995) and follow in most cases neo-classical traditions. The applied model in this paper borrows from the school of evolutionary economics (Nelson & Winter 1982) as features like technological change, imperfect competition and interdependencies, or partially sticky prices are standard characteristics. In INFORGE, parameters and their elasticity values are estimated econometrically with given time series for a large number of variables, whereas most CGE-models calibrate their parameters on a given benchmark or obtain elasticity values from literature (Peichl 2005).

Integral element of input-output-modelling is the determination of intermediate demand between industries. Input coefficients represent the relation of intermediate demand to total production. Technological change is identified by applying variable input coefficients. They are endogenously determined with relative prices and time trend. Using the Leontief-inverse $(I-A)^{-1}$ and by multiplying it with final demand (fd) gives gross production (y) by 59 industries. (A) is the input coefficient matrix for 59 categories of goods and 59 industries. (I) is the identity matrix. In the following equations the notations are as follows: lower case letters are vectors, upper case letters are either times series or matrices. The dimension of vectors and matrices are indicated with subscripts. The subscript *t* indicates time dependency.

[1] $$y_t = (I - A_t)^{-1} \cdot fd_t$$

In many macroeconomic models, private consumption is based on the almost ideal demand system (AIDS) approach (e.g. Kratena & Wüger 2006), which allows the estimation of consumption structures according to utility maximization behaviour and consequently does build upon the assumption of a representative individual (Deaton & Muelbauer 1980). Different to this approach, INFORGE estimates consumption patterns

by 41 purposes of use (c) as a function of real disposable income (Y/P) and relative prices (p/P). For some consumption purposes, trends (T) as proxy for long-term change in consumption behaviour or the number of private households (H) is used as explanatory variable.

$$[2] \qquad c_{l,t} = c_{i,t}\left(Y_t / P_t, p_{l,t} / P_t, T, H_t\right) \qquad l \in [1,...,41]$$

INFORGE differentiates between ten classifications of the functions of governments for modelling state expenditures a final consumption. 90% of total expenditures are solely due to three government functions alone: (i) public administration, military and social security, (ii) education and (iii) health and social welfare. Driving forces for state consumption are disposable income of the government (YG), employment (E) as well as demographic change (B).

$$[3] \qquad g_{k,t} = g_{k,t}\left(YG_t, E_t, B_t\right) \qquad k \in [1,...,10]$$

Gross fixed capital formation is the result of separate modelling of production investment (including other investments in equipment) and building investment. Production investments (i) by 59 industries are determined by industrial production (y). In some industries time lags are explicitly considered.

$$[4] \qquad i_{i,t} = i_{i,t}\left(y_{i,t}, y_{i,t-1}\right) \qquad i \in [1,...,59]$$

In 2011, the trade balance has contributed 0.8% to Germany's real GDP growth and is therefore a major factor for economic growth in Germany. The modelling approach follows a cascade system which we refer to as a Foreign Trade Cascade System (FTCS). It is a step-by-step process which derives German exports by goods and services from GDP-growth projections of 56 trading partners of Germany. Projections of the economic development in Germany's world trading partners are taken from the International Monetary Funds (2011), the European Commission (2011) and the International Energy Agency (2011). By using bilateral trade matrices from the OECD (2011), import shares are derived in total and by product groups giving total export demand for Germany. This information is used for estimating the development of foreign incoming orders for industries which again determine turnover (to) of industries. Finally, nominal exports are computed using the derived information on world trade development.

$$[5] \qquad x_{i,t} = x_{i,t}\left(to_{i,t}\right) \qquad i \in [1,...,59]$$

Basic prices (p) which are decisive for entrepreneurs are the result of unit costs (uc) and mark-up pricing. The extend to which mark-up pricing can be realized depend on the market form prevailing in specific industrial sectors. In industries with monopolistic structures, mark-up pricing is easier to realize than in competitive industrial structures. Price stickiness is obtained by estimating price elasticities lower than 1. Industries that are strong in exports also have to consider import prices (pim) as they are exposed to foreign competitors as well. Thus, the price setting behaviour of firms depends on two factors: (i) on the cost structure of a firm and (ii) on the price pressure caused by competing import goods. When the firm has decided on its sales prices, the demand side reacts accordingly which again affects production output (Meyer & Wolter 2007).

[6] $p_{i,t} = p_{i,t}\left(uc_{i,t}, pim_{i,t}\right)$ $i \in [1,..,59]$

5 SIMULATING GERMANY'S EMU BREAK-UP

5.1 ASSUMPTIONS

This chapter applies the macro-econometric forecasting and simulation model INFORGE for simulating Germany's EMU break-up. A business as usual scenario is used as a benchmark for two simulations that differ in two basic assumptions relating to the future development of the exchange rate and the future economic development of the remaining EMU member countries. The simulations are calculated until 2030 and starts in 2016. The long time horizon gives room for adaptation processes. The following table summarizes the basic assumptions for the exchange rate, main refinancing factor of the central bank and the growth path of the remaining EMU member countries for the baseline scenario and for the two simulations.

Tab. 6: Summary of assumptions

	Exchange rate [to USD]	Interest rate [Central Bank]	GDP nominal growth [EMU ./. Germany]
Baseline			
2016	1.43	2.50	3.7 p.a.
2030	1.33	3.00	
SIM1			
2016	1.43	2.50	3.7 p.a.
2030	1.67	4.00	
SIM2			
2016	1.43	2.50	2.2 p.a.
2030	2.22	4.00	

The baseline projection assumes that the EMU is not falling apart and that the budget crisis is not worsening. This projection assumes a constant depreciation of the Euro towards the Dollar from 1.43 in 2016 to 1.33 until 2030 and a steady increase of the ECB main refinancing rate to 3.00. The remaining EMU member countries are expected to increase by average 3.7% p.a. until 2030. In the benchmark scenario, Germany realizes an average growth increase of nominal GDP by 1.8% per year. Prices are expected to increase steadily with 1% per year, remaining under the inflation target of the ECB leading to an average real GDP increase by 0.9% per annum. The prospected growth rates are mainly driven by private consumption and foreign trade. Whereas in the first years, the impact of foreign trade is the strongest, the growth impact of private consumption is increasing in time.

The first scenario (SIM1) assumes Germany to unilaterally break-up from the EMU whereat the rest of EMU member countries remain at the growth path of the baseline scenario. The exchange rate is expected to increase by 20% with reference to the

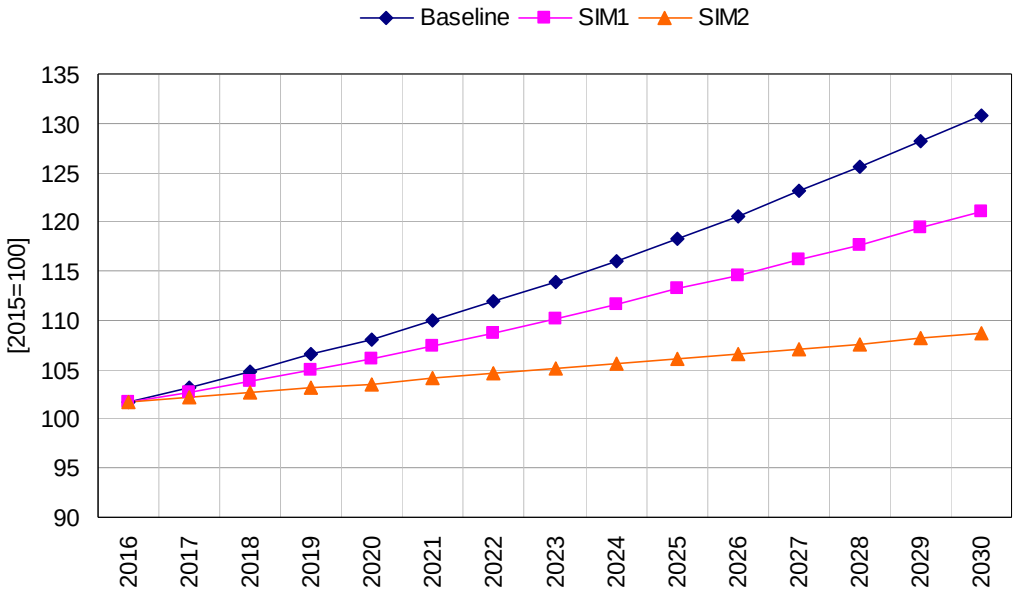
baseline. This leads to a graduate increase in the currency relation between NDM and US-Dollar to 1.67 in 2030. The main refinancing interest rate of the new central bank of Germany (NCBG) is expected to be higher to the reference scenario by 100 base points. The economies of the EMU are expected to remain at their specific growth path from the baseline scenario.

The second scenario (SIM2) assumes also a unilateral break-up of Germany from the rest of EMU but with a worsening of the growth-path in the remaining countries. The central bank's refinancing interest rate is assumed to be higher for Germany in both scenarios as opposed to the ECB interest rate in the baseline scenario. The exchange rate is expected to appreciate by 40% with reference to the baseline. The higher speed in appreciation is expected due to the worsening of the crisis in the remaining Eurozone. It is assumed that investors increasingly transfer their assets to Germany with declining growth perspectives in EMU. This leads to a graduate increase in the currency relation between NDM and US-Dollar to 2.22 in 2030. Parallel, the average growth rate of the Eurozone is lower to the reference by 1.5%-points. Likewise in SIM1, the main refinancing rate of NCBG is expected to be higher to the reference scenario by 100 base points.

5.2 MACROECONOMIC RESULTS

Graph 1 shows the indexed development of nominal GDP of the baseline scenario and SIM1 and SIM2. Both simulations produce lower growth paths compared to the baseline scenario. The positive impacts of the transmission channel (lower prices, lower imports, higher real wages) are outbalanced by the negative impact induced by the export channel. A unilateral break-up of Germany and a simultaneous worsening of the budget crisis in the EMU have a much stronger negative implication for Germany than under the conditions of SIM1. The gradual appreciation of the NDM prevents the emergence of a sudden recession but the force of the exchange rate appreciation is significant. By 2030, nominal GDP is in both simulations considerably lower than projected in the baseline scenario.

Graph 2: Nominal GDP

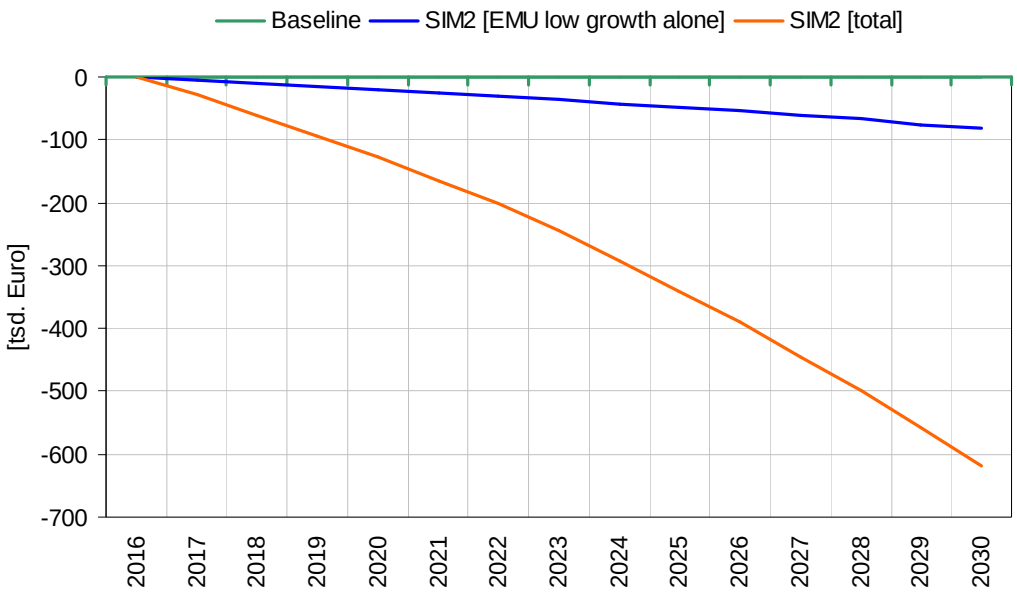


Source: own calculation

In SIM1, the described assumptions initiate a total decline in nominal GDP by nearly 270 bn Euros in 2030. Positive implications from the ease in price developments on real wages are outbalanced. The export channel is hampered due to the currency appreciation. The resulting production slow-down affects employment, wages and salaries and, hence, private consumption. In combination with a decreasing investment cycle, imports are lower compared to the baseline scenario. The overall current account effect is negative with respect to the baseline scenario. The decline in imports does not compensate the decline in exports. State consumption shows a slightly positive deviation due to the activation of the automatic stabilizing factors. A slower price development results in a considerable smaller loss in real GDP compared to nominal GDP.

The negative implication of SIM2 affects Germany much stronger than in SIM1. The additional appreciation impact in combination with a lower growth perspective in the Eurozone lowers nominal GDP with respect to the baseline scenario by 600 bn Euro in 2030. The main impact results from the additional exchange rate appreciation. The slow-down in economic development in the remaining EMU economies has a much lower impact on Germany. Whereas a slower growth path only implies a reduction in nominal GDP by 80 bn Euro in 2030, the 40% appreciation of NDM initiates a nominal GDP difference to the baseline scenario of 530 bn Euro in 2030 (Graph 3).

Graph 3: Absolute deviation from baseline of nominal GDP [SIM2]



Source: own calculation

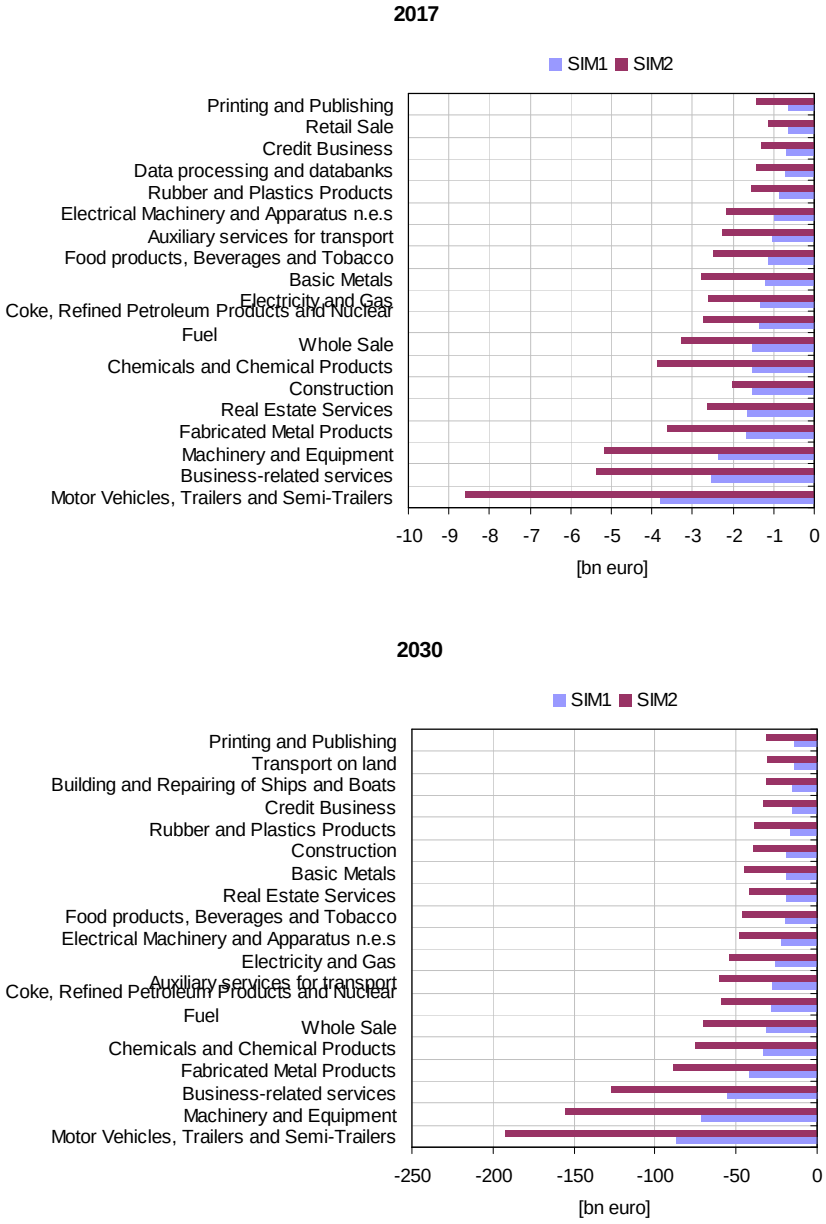
5.3 EFFECTS ON INDUSTRIAL LEVEL

Effects on industrial level are shown for SIM1 and SIM2 in Graph 4 for the first and last year of the impact. As expected, the magnitude of the impact is stronger in SIM2. In average, the amplitude is roughly twice as high in SIM2 as in SIM1. Whereas the order of the strongest negatively exposed industries is the same for both simulations in 2030, the first year of the impact analysis differs between both break-up scenarios. The stronger negative trade implications in SIM2 are shown in the stronger negative impact for export oriented industries. The chemical industry is less negatively affected in SIM1 than in SIM2 which results from its strong direct and indirect export exposure due to its functioning as important producer of intermediate goods.

For SIM1 and SIM2, the most negative implication is observed in the automotive industry which mirrors the strong export exposure of this industry. By 2030, the automobile production reduces by 90 bn Euros in SIM1 and twice as much in SIM2. Machinery industry and business-related services are following as second and third strongest exposed sectors. The strong economic effect on production in the business-related service sector results from labour leasing. Temporary workers are grouped statistically in this economic sector but rely effectively on business cycles in other industrial sectors.

The gradual appreciation of the exchange rate penetrates the machinery industry in the long term stronger and hits faster than in other industries. This observation results from the fast increasing export demand within the machinery sector projected in the baseline scenario. The automobile industry shows a comparatively slower increase in exports. The negative implication of an exchange rate has, hence, stronger impacts on machinery than on car production.

Graph 4: Economic industries – absolute deviation to baseline



Source: own calculation

6 SUMMARY AND CONCLUSION

This paper has analysed the economic effects in Germany resulting from unilaterally exiting the EMU. Two simulations were calculated using the integrated form of a macro-econometric input-output model. The qualitative results resemble the outcome of other work on this subject: In the long run, leaving the EMU would result in a massive loss in GDP and would lead Germany to a slower and lower growth path. Likely positive effects of a break-up are fully compensated by the accompanying negative implications. The overall negative effects on the current account outbalance positive implications of a lower price level, increasing real wages and lower imports. The loss in international competitiveness

due to the appreciation tendency of the NDM would massively reduce export. As the German economy depends strongly on foreign demand, domestic production, investments and, hence, employment and private consumption would be lower compared to the baseline scenario. A worsening of the sovereign debt crisis in Europe would worsen the negative impacts from a unilateral break-up. A faster appreciation combined with a lower growth path in the Eurozone would reduce GDP growth further. The negative implications are the strongest in those industries that depend strongly on exports – like the automobile industry or the producers of machineries and equipment. Service sectors are less affected, except of the business-related service sector. This specific branch of industrial classification depends heavily on business-cycles in the manufacturing industry because temporary workers are grouped in this category.

Such an economic experiment as pursuit in this paper requires strong assumptions. The results are thus to be seen in the light of these boundaries that has been unfold. Especially, the assumption on the likely movement of interest rates, currency exchange rates and the economic development of the remaining EMU economies frames the modelling output. Also, the scenarios did not consider speculative movements that could accompany such break-up scenarios demonstrated in this paper. The likely counteraction of the central bank of other economies is not integrated.

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