Shall the New EU Members Introduce the Euro?

Some Macroeconomic Policy Effects

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Abstract

After the EU enlargement in 2004, there is a clear commitment of the EU and the new member states to aim at an enlargement of the euro zone within the European Economic and Monetary Union (EMU) as well. This might have significant effects on the "old" EMU, the "new members" and even on the global economy. The present paper analyzes some macroeconomic effects and particularly the impact on the effects of stabilization policies when switching to an enlarged euro zone under different assumptions about fiscal and monetary policy regimes in Europe and under alternative types of economic shocks. Also the implications for the USA of different European monetary regimes are evaluated. The results suggest that economic benefits for all countries are rather small. For the Central and Eastern European countries (CEECs) even disadvantages may dominate.

1   Introduction

On May 1, 2004, ten countries, mainly from Central and Eastern Europe (CEECs), became members of the European Union (EU). The enlargement has created a political and economic entity of a size comparable to the USA, which may have important consequences on the global economy. The new members of the EU, although legally already members of the European Economic and Monetary Union (EMU), cannot adopt the common European currency, the euro, immediately, but there is a clear commitment in Europe that their full monetary integration will be a main policy objective during the next few years. According to regulations in effect since the Maastricht treaty, the earliest date for any of these countries to enter the euro zone (i. e., to introduce the euro as legal tender and become fully integrated into the EMU) will be in 2006; all potential new EMU members have announced their desire to enter the euro zone by 2010.

There is a large literature focusing on several macroeconomic aspects of monetary unions, especially the EMU. For example, the specific design (objectives, institutional setup) of macroeconomic policy and in particular of monetary policy in Europe has been discussed intensively; see, among others, Buti and Sapir [1998, 2003], Allsopp and Vines [1998], Eijffinger and de Haan [2000], Neck [2002a; 2002b], Neck and Holzmann [2002], Allsopp and Artis [2003], De Grauwe [2003]. These authors arrive at different conclusions about the "best" strategy for the European Central Bank (ECB) and/or the fiscal policy-makers. More generally, questions of international policy coordination may arise. For instance, Hughes Hallett and Mooslechner [1999] emphasize the strong effects of policy coordination on the overall outcome of economic policy in Europe, and Hughes Hallett et al. [1999] analyze the problems of fiscal policy coordination in the EMU in more detail. Haber et al. [2002] give some hints concerning the choice of intermediate targets and the desirability of policy coordination in a European and global context, whereas in Neck et al. [2004; 2005], special emphasis is put on the enlargement of the EMU. These papers give some indication that in the presence of supply shocks, fixed rules tend to produce better results, while demand-side shocks seem to call for more activist (discretionary) economic policy (contingent rules). In most cases, cooperation seems to dominate non-cooperation in terms of a macroeconomic objective function. The present analysis is an extension of this literature, considering a larger variety of scenarios and focusing on effects of different policy arrangements after a possible EMU enlargement (or CEECs' membership in the EMU; we use these notions as shortcut for "membership in the euro zone" or "adoption of the euro as legal tender") on the present EMU members, the new EU members, and the global economy.

In particular, this paper analyzes some possible consequences of CEECs' membership in the EMU on the effects of macroeconomic stabilization policies under alternative assumptions about fiscal policies of the European governments, monetary policies of the ECB, and fiscal and monetary policies of the USA (where we assume that fiscal and monetary policies in the USA are conducted in a coordinated manner). There are two basic institutional scenarios, one implementing the present EMU with twelve member states (EMU-12) and another one with a hypothetical full-scale monetary union (EMU-12 plus CEECs), which is called "EMU-new". In several simulation and optimization experiments with a macroeconomic model, various shock scenarios are imposed and the effects on the values of an objective (loss) function are evaluated. In a next step, the impact of EMU enlargement for the different

countries or regions (EMU-12, CEECs, and USA) on the effects of stabilization policies is quantified by calculating an "index of welfare effects" of EMU enlargement.

For the ECB, we consider two different intermediate targets, namely a fixed-rule monetary policy (monetary targeting) and a contingent-rule policy of inflation targeting. Regarding fiscal policy variables, we assume that the governments of both incumbent and new members may either refrain from pursuing active stabilization policies or follow either non-cooperative or cooperative activist fiscal policies. The USA implements either passive (no reaction on shocks and on policy changes abroad) or active stabilization policies according to an objective function that is assumed to be the same for the US government and the Fed. In order to keep the analysis as simple as possible and in view of weak international spillover effects, no other countries are assumed to pursue active policies.

2   Methodological Approach

For the calculations in this paper, the McKibbin-Sachs Global Model (MSG2 Model), a dynamic, intertemporal, general-equilibrium model of a multi-region world economy, is applied (version MSGR44A). Based upon microeconomic foundations by assuming that economic agents maximize intertemporal objective functions, the model exhibits a mixture of classical and Keynesian properties: partly rational expectations in combination with various rigidities allow for deviations from fully optimizing behavior. In particular, nominal wages are assumed to adjust slowly in the major industrial economies. Nevertheless, the model solves for a full intertemporal equilibrium. McKibbin and Sachs [1991] describe the original version of the model in full detail. Additional resources concerning the up-to-date model versions are available on the web (http://www.msgpl.com.au/).

The long run of the global economy is driven by a neoclassical growth model, with exogenous technical progress and population growth. Keynesian rigidities in the goods and labor markets in the short run and optimal decisions, conditional on expected future paths of the world economy, drive the short run of the model. The model captures long-run effects of shocks and short-run dynamics towards these long-run outcomes, with expectations formation providing a link between the long-run outcome and the short-run adjustment.

The model version used here contains the following countries and regions: the United States, Japan, Germany, the United Kingdom, France, Italy, Austria, the rest of the former European Monetary System (REMS), the rest of the OECD (ROECD), Central and Eastern European economies (CEEC), non-oil developing countries, oil-exporting countries, and the former Soviet Union. Institutional differences are taken into account. For the simulation and optimization experiments described in this paper, the original MSG2 Model had to be modified by implementing the European System of Central Banks (ESCB) for the EMU. Money supply in all current ("full") EMU member countries (twelve countries in reality, five regions in the model) is no longer available as a policy instrument, but monetary policy is conducted by the ECB in an independent way. Therefore a single monetary authority is assumed in the EMU (the ECB) and several national fiscal policy makers inside the EMU (and one in the CEECs).

In order to evaluate the political ("welfare" in the sense of economic policy objectives) effects of different strategies followed by European and US monetary and fiscal policy-makers, it is necessary to define a normative measure of the economic outcomes of different simulation runs. Economic welfare losses caused by various (transitory) shocks are calculated by assuming a standard additively separable quadratic objective ("welfare loss") function. The welfare losses in each period are equal to the sums of the weighted quadratic differences between the actual values and the optimal values for each of the target variables. Next, the welfare losses in each future period are discounted to their present values (using the rate of time preference of the policy makers, which is assumed to be 10 percent) and summed up over the time horizon (infinity in theory, 97 years in the simulations) to obtain the measure of total welfare loss.

The welfare losses should be interpreted in an ordinal sense, i.e. in terms of a ranking or by identifying an improvement or deterioration of the values of the objective function. To compare policy effects of switching from the present EMU-12 monetary union to an enlarged "EMU-new", we define an "index of welfare effects" of EMU enlargement. As we consider eight exogenous shocks in this paper, the index is calculated as the difference of the number of shock scenarios for which an improvement of the social welfare function can be identified, and the number of scenarios where the stabilization effects of the policy makers are less desirable (giving worse results in terms of the values of the welfare loss

function). Thus, the index can range from –8 to +8, where e.g. +8 means that for all eight shock scenarios, stabilization is more successful in the enlarged "EMU-new".

For the countries or regions for which a welfare loss (objective) function is specified (Germany, France, Italy, Austria, REMS, CEEC, USA), the assumed target variables are the inflation rate, real GDP, the current account and the fiscal deficit (of general government). All targets are given equal importance. The desired (benchmark) values of the target variables are set at their baseline (reference) values because the baseline simulation run represents a stable path towards a long-run equilibrium of the model. European objective function values are calculated as weighted averages of the respective country-specific values, with country weights derived from values of GDP at market prices.

3   Institutional Scenarios

The first dimension of the scenarios arises from different fiscal and monetary policy setups. Let us first consider alternative possibilities of fiscal policy design. When a country is assumed to pursue an "active" (i. e., optimizing) economic policy, the four economic target variables mentioned above enter the objective function of this country. In these cases, nominal government consumption is an instrument for each "active" country. All other countries are assumed not to react upon shocks and policies implemented by the "active" countries. In scenarios with active policy in the USA, US monetary and fiscal policy-makers are assumed to optimize a joint objective function of the same type as the ones for the "active" European countries (with the respective US target variables, of course).

INSERT TABLE 1

In a scenario "F-NOP" ("F" means "fiscal policy" and "NOP" means "no (active) policy reaction"), there is no active fiscal policy at all; only monetary policy may be conducted in an active way. When only European fiscal policy is active, the scenario is denoted "F-EUR", while "F-USA" denotes the opposite (only US fiscal policy is active, but there is no active European fiscal policy). "F-NC" ("NC" mean "non-cooperative") is an empirically highly relevant scenario, in which both European and US fiscal policies are actively used in a non-cooperative way. Finally, in scenario "F-EUR-C" European fiscal and monetary policies are jointly optimized (full cooperation of all national fiscal policy makers and the

ECB) and the ECB gets the same weight in the common objective function as all national fiscal policy makers together. This shall mimic the realistic feature of a rather strong (and in a certain sense truly "independent") central bank in Europe, which nevertheless cooperates with the national governments. For additional fiscal scenarios, see Neck et al. [2004; 2005].

For European monetary policy in the EMU, on the other hand, we assume that it is set independently by the ECB according to an intermediate target. Again, different "institutional scenarios" with alternative ECB strategies (intermediate targets or policy rules) are considered. Two different policy rules for the ECB are analyzed here: The "no (active) monetary policy/monetary targeting" ("MON/NOP") rule leaves the monetary instrument (money supply) of the ECB at its baseline values. Under this policy rule, the ECB targets money supply according to a more or less fixed rule (therefore it is also called "MON"). Due to its particular implementation in the MSG2 Model (not to be discussed in detail), this (intermediate) target can be reached exactly, thus we have a strict assignment of the monetary policy instrument to the monetary intermediate target for all MON scenarios. Alternatively, the policy rule of inflation targeting (INF) is implemented by modeling the ECB as a player in a dynamic game. Also in these cases the ECB has one single target assigned; hence it is always able to reach this target exactly in the non-cooperative cases. Monetary targeting and inflation targeting serve as models for elements of the ECB's "two-pillar" strategy. Alternative intermediate monetary policy targets for the ECB are analyzed in Neck et al. [2004; 2005].

For all scenarios considered, the effects of enlarging the EMU are the main point of interest. Therefore, it has to be decided how to deal with CEECs' monetary policy, because with a small EMU-12 monetary union, the CEECs can in principle pursue independent monetary policies, while this is no longer possible if they are part of the euro zone. For reasons of comparability, the CEECs are assumed not to implement an active monetary policy in scenarios in which they do not belong to the EMU. Rather, they keep their money supply at the baseline values, adjusting money supply in order to follow a long run stable growth path of the national economy as if there were no exogenous shock at all.

In the non-cooperative scenarios, the players minimize their respective welfare loss functions subject to the dynamic model and given the optimizing behavior of the other players (dynamic feedback Nash-

Cournot equilibrium). In the cooperative scenarios, a joint welfare loss function, which is a weighted sum of the individual objective functions, is minimized subject to the dynamic model (collusive solution). The cooperative solution can be interpreted as the result of an agreement between the ECB and the fiscal policy-makers (the governments) of the six European countries/regions. A hypothetical scenario with full cooperation between all national fiscal policy makers in Europe, the ECB, and the USA may not seem to be a realistic possibility at present, so it is skipped here. To avoid time-inconsistency problems, all non-cooperative simulations are carried out by calculating a closed-loop feedback (Markov-perfect) equilibrium solution of the dynamic policy game under consideration. The NOP/MON (ECB) scenarios in combination with the F-NOP (fiscal policy) scenarios, which correspond to fixed rules for both macroeconomic policy instruments, are not time-consistent and can therefore be carried out only if strong elements of self-commitment are enforced.

4   Shock Scenarios and Their Impact

For all scenarios considered, we calculate the effects of a temporary negative supply (total productivity) shock and a temporary negative demand (autonomous consumption) shock. See Table 2 for a systematic overview of the abbreviations used throughout the paper. "Y" denotes the supply shock, while "C" denotes the demand shock.

INSERT TABLE 2

The negative productivity shock can be interpreted as a temporary inward shift of the production possibility frontiers of the countries affected. Total factor productivity is assumed to fall by 2 percent in the first year, 1.5 percent in the second year, 1 percent in the third year, and 0.5 percent in the fourth year as compared to the baseline of the model. A negative demand shock shifts the aggregate demand curve to the left. Here, we simulate the consequences of a temporary exogenous decrease of real private consumption. In these simulations, autonomous real private consumption is assumed to fall by 6 percent in the first year, 4.5 percent in the second, 3 percent in the third, and 1.5 percent in the fourth year as compared to the baseline of the model.

For both types of shocks, we distinguish between a CEEC shock (affecting the CEEC block in the model – "A" for "accession countries"), an EMU-12 shock (affecting the "old" EMU-12 – "O" for "old"),

an "EMU-new" shock (affecting the EMU-12 and the CEEC block simultaneously – "N" for "EMU new"), and a global shock (affecting all fully modeled regions in the model – "X"). This allows for the assessment of various possibilities for asymmetric shocks as well as for symmetric European or global shocks.

The negative supply shock causes the well-known stagflation dilemma: GDP decreases while the price level increases. Dealing with this type of shock is non-trivial, as expansionary policy measures would also increase inflation, while restrictive economic policy would further reduce real output. The demand shock does not raise this issue, as the price level decreases in this case. These well-known effects occur in the reference case where no policy is conducted at all. The other scenarios considered differ with respect to the interventions by the policy-makers, who try to counteract lower output and higher prices. Here we report only about the results of selected simulation, optimization and dynamic game runs, as the emphasis of the analysis is on the welfare effects and the power of stabilization policies rather than the exact values of the instrument and objective paths.

5   Effects for the EMU-12 (Present Euro Zone)

In order to get some hints on the advantages or disadvantages of enlarging the EMU (the euro zone), the index of welfare effects is calculated for each of the fiscal and monetary scenarios. In a first step, the figures for the four demand shocks and the four supply shocks are calculated separately, giving a range from –4 to +4 for the index. Remember that a positive index means that in the majority of shock scenarios, the enlargement of the monetary union increases the positive effects of the stabilization policy instruments. Table 3 shows the results, separated by the type of the shock. In each cell in the table, the first number corresponds to the demand shock scenarios, the second to the supply shocks. The overall results for both shocks are shown in Table 4. It is worth noting that in reality it is not easy to forecast even the type of shock (demand or supply side) prevailing in the next period. Thus, for practical policy purposes, the figures in Table 4 may be more useful than the decompositions presented in Table 3. On the other hand, it might be interesting from the theoretical point of view whether there are significant differences between supply and demand shocks with respect to the advantages or disadvantages of an EMU enlargement.

INSERT TABLES 3 AND 4

If only the USA pursues an active fiscal policy, the larger EMU is mostly beneficial for the EMU-12 both for the demand and for the supply shocks. Note that there is no fiscal regime in which for both types of shocks, the larger euro zone would be worse in the majority of cases. Considering the overall figures of Table 4, the enlargement would put the EMU-12 in a less favorable position in the inflation targeting scenarios with no fiscal policies and with active fiscal policy in the USA only: the number of cases with lower welfare effects of the economic policy instruments is higher than the number of the cases with advantageous EMU enlargement effects.

If the ECB considers its money supply as the intermediate target variable, this represents a rather stable framework from an overall perspective with respect to the benefits of the euro zone enlargement. In this case, advantages can be observed regardless the specific fiscal policy setup. In this case, active fiscal policy in the USA (F-USA and F-NC) improves the welfare effects index. In all scenarios with active fiscal policies in Europe (F-EUR, F-NC, F-EUR-C), the index is non-negative for both monetary policy rules (monetary and inflation targeting). Even in the presence of the regulations on fiscal policies due to the European Stability and Growth Pact (SGP), which tend to limit the possibilities of the national governments of using fiscal policies in an arbitrary manner, it is highly unrealistic to assume the complete absence of active (the presence of purely rule-based) fiscal policies in Europe. Therefore, there is a clear indication that the enlargement of the monetary union could on average increase stability for the EMU-12, although in some cases the performance of stabilization policy instruments might deteriorate.

Considering the most realistic case of non-cooperative active policies in Europe and in the USA (F-NC), another interesting result can be seen from the analysis: with inflation targeting behavior of the ECB, the EMU enlargement is always beneficial for the present EMU (+4) when the economy faces demand shocks. In the presence of supply shocks, inflation targeting implies clear welfare losses except in the case of a supply shock limited to the new EMU member states. Note that the preference ordering is the opposite for monetary targeting (MON/NOP) in this fiscal scenario.

6   Effects for the CEECs

The results for the CEECs can be found in Tables 5 and 6. In contrast to the EMU-12 welfare effects, some of the scenarios differ quite a lot in terms of the welfare effects. With only one exception (the fully cooperative European scenario F-EUR-C), in all cases the average or overall stabilization policy performance of the CEECs is reduced by the EMU enlargement (Table 6). This result is triggered by the fact that spillovers to the CEECs are stronger when they are members of the euro zone. If there is no active fiscal policy in Europe including the CEECs (F-NOP and F-USA), the negative effects of the EMU enlargement are most obvious (welfare effects index values: –8 for monetary targeting and –6 for inflation targeting).

INSERT TABLES 5 AND 6

In the more realistic scenarios with active European fiscal policy (F-EUR and F-NC), there is no clear preference in the case of money supply targeting, while for inflation targeting there is a slight disadvantage associated with the enlarged EMU (the index values are –2 and –1, respectively). The separate figures for demand and supply shocks (Table 5) show that in the most realistic non-cooperative scenario with active fiscal policies in Europe and in the USA, the stabilization policy performance under demand shocks is nearly unchanged on average for the CEECs' economies, while the enlargement tends to impose welfare reductions in the presence of supply shocks.

These results are somewhat surprising at first sight, because in the political discussions taking place all over Europe many people argue against the EMU enlargement by claiming that such an effort could destabilize the present EMU economies but improve the policy outcomes of the new member states. In fact, our analysis gives a clear indication against this point, as its findings suggest that the new member state do not gain from a euro zone enlargement in terms of improving effects of stabilization policy instruments. These results are, however, in line with some empirical literature on the EU accession of the CEECs, which estimates that there are some economic effects associated with the EU enlargement, but these are not sufficiently high to be the main reason for this European unification process; instead, there may be more important political reasons which cannot be measured on an economic scale.

7   Effects for the USA

There are also some macroeconomic effects of an EMU enlargement for the USA. In some of the scenarios, virtually no changes in the values of the objective function can be observed, but a few other scenarios show significant differences. The interesting point in this part of the analysis is the fact that there is a substantial difference for the USA regarding the monetary regime in Europe.

INSERT TABLES 7 AND 8

If the ECB follows a monetary targeting regime or (in our framework equivalently) no active monetary policy (MON/NOP), exchange rate reactions under the flexible exchange rate regime of the USD versus the EUR virtually isolate the US macro economy from the European. This helps neutralizing negative spillovers of European fiscal policies on the USA. For supply shocks, the EMU enlargement even improves the stabilization policy effects of the US policy instruments. If the USA does not pursue activist fiscal and monetary policies and the European governments also refrain from such a strategy, the USA still gain from a larger EMU. For the demand shocks, there is only one case (F-EUR) in which there is a small reduction in the welfare effects index. When putting together the results for the different types of shocks, there are on average benefits from the EMU enlargement for the USA, although they are quantitatively small.

In the more realistic setup with European inflation targeting, the scenarios with active European fiscal policies tend to reduce the decoupling effects of the flexible exchange rate by counteracting the shock in Europe. Now deteriorations of US stabilization policy effects can be observed (index values –5 and –4, respectively). This tendency holds not only for the overall effects but also for the separate analysis of supply and demand shocks. From the US perspective, the strengthening of the euro zone tentatively increases spillovers to the USA and reduces the ability of the USA to lean against the wind in the presence of negative macroeconomic shocks, originating both from the demand side and the supply side. The US economy becomes more vulnerable to all these kinds of shocks.

8 Conclusions

Putting together the results for the EMU-12 and the CEECs, Figure 1 shows a summary of the stabilization policy effects of an EMU enlargement: On the horizontal axis, there is the stabilization policy welfare effects index for the EMU-12 region, on the vertical axis are the values for the CEECs. A graphical inspection easily reveals that there are no data point in the upper right-hand part of the panel which represents an area in which there are advantages for both the CEECs and the EMU-12. Only the European non-cooperative active policy scenarios (F-EUR and F-NC) in combination with (the less realistic case of) monetary targeting (MON) are neutral from the point of view of the CEECs.

INSERT FIGURE 1

The analysis shows that the advantages and disadvantages of an extension of the euro zone to the CEECs with respect to welfare effects of stabilization policies strongly depend on the nature and scope of the shocks the economies are faced with and on different institutional setups regarding monetary policy targets on the European level and fiscal policy design in a global context. There are also important differences with respect to the international spillovers of shocks and feedbacks from policies. Previous results on the advantages of fixed rules as an answer to supply shocks and more activist policies against demand shocks are supported by the present results for the European countries, but not for the USA. Cooperation is not necessarily better than non-cooperative activist policy-making.

In most of the scenarios, the EMU enlargement does not lead to significant welfare effects for the present members of the EMU. Thus, additional macroeconomic noise resulting from the CEECs' membership does not seem to be too much of a problem for the present members of the EMU-12. On the other hand, no advantages for the CEEC countries can be identified. For the accession countries, EMU membership provides a significant improvement of the effects of macroeconomic policy instruments in one single case only. The results for the USA are not substantially affected by including the CEECs in the EMU, which may lead to conjecturing that global effects of the EMU enlargement will also be minor. At present, it seems as if the decision about the EMU membership of the accession countries need not too much be influenced by macroeconomic policy considerations.

Acknowledgement

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Table 1:
Fiscal Policy Institutional Scenarios

Fiscal Policies Europe	No Policy	EMU-12 and CEEC Active	No Policy	EMU-12 and CEEC Active	EMU-12 and CEEC Active
Fiscal Policies USA	No Policy	No Policy	Active	Active	No Policy
Cooperation	–	Non-cooperative	Non-cooperative	Non cooperative	Cooperative
Scenario Abbreviation	F-NOP	F-EUR	F-USA	F-NC	F-EUR-C

Table 2:
Shock Scenarios

	Scope of the Shock	CEECs	EMU-12 ("old EMU")	EMU-new	World
Type of the Shock	Supply (Productivity)	YA	YO	YN	YX
	Demand (Consumption)	CA	CO	CN	CX

Table 3:
Effects for the EMU-12 (Separated by Demand and Supply Shocks)

(Demand / Supply)	F-NOP	F-EUR	F-USA	F-NC	F-EUR-C
MON/NOP	0 / 0	−1 / +1	+4 / +2	−2 / +4	+2 / −2
INF	0 / −2	+4 / −2	0 / −1	+4 / −3	+3 / −1

Table 4:
Effects for the EMU-12 (All Shocks)

	F-NOP	F-EUR	F-USA	F-NC	F-EUR-C
MON/NOP	0	0	+6	+2	0
INF	–2	+2	–1	+1	+2

Table 5:
Effects for the CEECs (Separated by Demand and Supply Shocks)

(Demand / Supply)	F-NOP	F-EUR	F-USA	F-NC	F-EUR-C
MON/NOP	–4 / –4	+2 / –2	–4 / –4	+2 / –2	+2 / +2
INF	–2 / –4	0 / –2	–2 / –4	0 / –1	0 / 0

Table 6:
Effects for the CEECs (All Shocks)

(Demand / Supply)	F-NOP	F-EUR	F-USA	F-NC	F-EUR-C
MON/NOP	–8	0	–8	0	+4
INF	–6	–2	–6	–1	0

Table 7:
Effects for the USA (Separated by Demand and Supply Shocks)

(Demand / Supply)	F-NOP	F-EUR	F-USA	F-NC	F-EUR-C
MON/NOP	0 / +1	–1 / +1	0 / +1	0 / +1	– / –
INF	+1 / –1	–2 / –3	0 / 0	–1 / –3	– / –

Table 8:
Effects for the USA (All Shocks)

(Demand / Supply)	F-NOP	F-EUR	F-USA	F-NC	F-EUR-C
MON/NOP	+1	0	+1	+1	– / –
INF	0	–5	0	–4	– / –

Figure 1:
Scenario Overview: EMU-12 and CEEC Stabilization Performance