

## The Single Market Review Series

### Subseries VI - Aggregate and Regional Impact

# AGGREGATE RESULTS OF THE SINGLE MARKET PROGRAMME

## Summary

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## Executive Summary

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## Background

The present study deals with the overall appraisal of the macro-economic implications of the European Union (EU) Single Market Programme (SMP). The SMP, as introduced by the Single European Act, involved a large list of measures aiming at implementing the Single Market, by the end of 1992. The Single Market Programme involved a series of measures aiming at affecting the European Economy in the following areas:

- Liberalisation of trade of goods, through elimination of border and fiscal formalities and abolition of technical barriers to trade.
- Liberalisation of cross border public procurement.

- General deregulation and more active enforcement of competition policy in all sectors.
- Liberalisation of trade of factors, through among others abolition of capital mobility controls.
- Liberalisation of cross border service provisions and abolition of restrictions to establishment.

## **Objective and Scope**

The objective of the present study is to evaluate the SMP effects in an ex-post manner by conducting simulations with an updated and adapted version of the **GEM-E3** model<sup>(1)</sup> an applied multi-country, multi-sectoral dynamic computable general equilibrium (CGE) model of the 12 EU member states.

- The ex-post character of this evaluation is conceived in a twofold manner:
- The study should use the actual performance of the EU economies, during the SMP implementation period, while

the primary effects of the SMP measures, as quantified by the sectoral studies <sup>(2)</sup> in an ex-post manner, should provide the input to the CGE-based evaluation.

The study solely focuses on the Computable General Equilibrium modelling methodology. A multitude of other CGE modeling analyses on the SMP effects, as reported in the literature, estimated the ex-ante implications of SMP. The present study is the first one, attempting to carry out a global ex-post evaluation, in the sense defined above.

## **"Monde" and "anti-monde" related to the SMP**

To evaluate a policy in an ex-post manner, one must be able first to reproduce the reality (the observations), by using the model, and then to simulate a counterfactual scenario that excludes the measures under evaluation, in the present case the SMP measures. In the following we use the term "monde" for the historical simulation and "anti-monde" for the counterfactual one.

Apart from the difficulty of deriving quantitative assumptions, at the level of detail demanded in terms of the model, from the often qualitative or aggregate information provided by the sectoral studies, the study had to circumvent two major obstacles for the ex-post analysis:

- The first was a conceptual difficulty: the "monde" occurred as such not only because of the measures under evaluation but also because of a multitude of other changes. If the measures had not taken place, the "monde" would be different, still not observable, but also some of the other changes would perhaps be different as well. It is certain, therefore, that the ex-post evaluation cannot avoid some degree of arbitrariness related to the separation of changes in a part that will be attributed to the SMP and a part that will be considered as non-attributable to the SMP. A transparent decision had then to be made regarding this distinction. For example, the following observed changes in 1985-1992 period, were assumed as non related to SMP completion: changes of tastes of

consumers, as the shifts in favour of automobiles, services, communications and health care, shifts in the propensity of trade that cannot be explained by relative price changes and SMP measures, most of the observed technical progress, government policy, monetary indicators and price evolution in the rest of the world.

- The second was a technical challenge: achieving a good replication of the observed economic statistics within a model run, termed "dynamic calibration" of the model. In the literature, there is no formal method proposed for dynamic calibration of CGE models. In the context of this study such a procedure was designed and followed. Additional limitations arise, however, from the poor statistical information, at the level of detail required by the model, as available by EU statistical sources(3).

### **The SMP measures in the model runs**

The study attempts to quantitatively evaluate the implications of the "anti-monde", i.e. the impact of the non application of the SMP measures. The measures and primary effects assumed in this study to form the SMP, were considered as follows:

1. Non tariff barriers (NTB) associated to delays in custom control formalities involving losses in trade transactions. Formulated as iceberg-type losses in export volumes, they range from 1% to 2.5% of trade flow costs.
2. Extra trade costs necessary for compliance with foreign non harmonised standards, labelling and packaging. Represented through ad valorem rates, of the order of 0.3% to 0.6% of trade costs, they also involve activity for market services associated to exports.
3. Costs of transports and banking activity associated to trade flows, also represented through ad valorem rates. They are likely to decrease because of efficiency gains in international transport and banking services supporting exports, entailing 0.1% up to 0.2% lower trade costs, differing by country.
4. The single market measures and the Commission's initiatives in pursuing liberalisation of sectors that were not included in the Single Market White Paper (e.g. insurance, telecommunications, air transports), incited economic agents to anticipate higher competition in all markets and achieve productivity gains. Based on sectoral studies, this has exerted particularly important effects on gains in the domain of X-inefficiencies in the banking and telecommunication sectors. For these sectors, an ad-hoc higher productivity of labour and capital reaching 2.5% and 5%, respectively, in terms of fixed cost requirements, was introduced as primary SMP effect.
5. Harmonisation of standards and regulations, and generally the completion of the single market, make consumers to perceive EU and domestic commodities as more homogenous than before, minimising distinctions in preferences over the geographic origin. This SMP effect is represented by a switch in the nesting of the consumers' preference structure reflecting market integration (in contrast to market segmentation, that prevailed before the SMP completion) and a subsequent increase in the price sensitivity of the consumers in their choice of EU products to reflect increasing homogeneity.
6. The realisation of the SMP increases the number of different commodity

varieties that are available to EU consumers, for final demand, intermediate consumption, investment building or public procurement. It is assumed that efficiency gains are derived from the increased possibility of choice for the consumers. These gains, that permeate the whole economy are endogenously modelled only in one of the "monde" variants simulated with the model. Instead in other "monde" variants, because of analytical reasons that will be explained below, an exogenous improvement of total factor productivity (reaching 0.1% in all sectors) is assumed to be induced by the SMP. This improvement is considered to implicitly include some of the efficiency gains from increasing availability of varieties, but may also include additional effects of accelerated technology progress facilitated by the enlarged market. In any case, the variety effect acts through consumption, while the total factor productivity effect acts through production.

The study does not cover the analysis of other SMP issues, such as tax harmonization, structural funds, international capital mobility, labour mobility and public procurement. For the last two issues, sectoral studies indicated that they have induced little effects over the study period. Also, mainly because of lack of sectoral data, the present model version does not include a split of labour in different skills and a corresponding representation of household classes. Such a model extension would allow for improved insight of social distributional effects of the SMP.

## **Modelling methodology**

The extended model, GEM-E3-SM, follows the standard methodology of computable general equilibrium frameworks, involving economic agents, producers and consumers, that compete through their demand and supply functions over a set of simultaneous markets of commodities and primary production factors, operating within a Walras economy (in which all economic transactions sum to zero, in equilibrium).

In addition, the extended model formulates a number of economic sectors (intermediate and equipment goods industries, banks and telecommunications) as being able to perform economies of scale and compete within an oligopolistic market regime. Firms operating in these sectors produce commodity varieties that are assumed not to be perfect substitutes in consumption. Bilateral EU trade flows, involving NTB and service-related trade costs, ensure a pan-European equilibrium. The model is dynamic, as simulating a time-dependent sequence of static equilibria depending on the updating of capital stock from endogenous investment.

The modelling framework simulates (and numerically calibrates) a mechanism through which market enlargement and the related increase of competition within the EU, can induce real growth effects.

Firms, perceiving more competition in the enlarged market, readjust their size, reduce price-cost margins and exploit economies of scale potential. This acts as a release of resources for the economy that become available for consumption and investment, entailing real growth effects.

Efficiency gains in exports and autonomous efficiency improvement in production act in a similar way: they allow for trade creation and a price fall.

Additional efficiency gains for the consumer (final or intermediate), as he can choose from an increased variety of commodities within the enlarged market, add real growth effects.

Foreign trade, involving the EU and the rest-of-the-world (RW) re-adjusts, through relative price changes. In a model variant(4), this has been restrained by fixing the current account (as a % of EU GDP) and letting the real interest rate to adjust domestic activity, while in other model variants the current account of the EU could freely vary, allowing for possible terms-of-trade effects.

## Design of Model Runs

<b>Title of simulation</b>	<b>Explanation</b>
<b>Constraint Case</b>	The current account as a % of GDP is assumed fixed in each member-state. The real interest rate by country can adjust. A total factor productivity assumption, related to the SMP, is included.
<b>Flexible Case</b>	Trade is freely adjusting in bilateral intra-EU trade and with respect to the rest of the world. The current account can freely vary, but real interest rates remain fixed. The EU can adjust its terms of trade vis-à-vis the rest of the world. A total factor productivity assumption, related to the SMP, is included.
<b>Efficiency Case</b>	As in "flexible case", regarding current account and the interest rate, but inclusive of endogenous efficiency gains coming from the increased variety of EU commodities in the enlarged market. No exogenous factor productivity gains are assumed.

The evaluation of the ex-post effects of the SMP is based on dynamic model runs (and sensitivity tests) over the period 1985 to 1991 (period observed) extended to 1994 (not observed). The baseline scenario is identical to the "monde" as this was dynamically calibrated. The "anti-monde" simulation is defined as the removal of the SMP measures described above.

Three main "anti-monde" scenarios were constructed and simulated with the model, as shown in the table. The "constraint case" does not allow for possible terms-of-trade effects in the EU economies (in the sense of implying net inflow of resources from the RW to the EU), when comparing the "monde" to the "anti-monde" simulations. The scenario assumes that in these two simulations, the level of current account by country as a % of GDP is kept unchanged, and to obtain this result, the economies can vary their real interest rates, so as to adjust their domestic activities in investment and consumption. That sort of "external sector" closure rule, often used in CGE modelling, allows to evaluate the effects of a policy in the domestic economy only, as a result of the new allocation (of sectors, investment, consumption, etc.) induced by the policy. In this sense, the analytical benefit from constructing the "constraint case" simulation, is the evaluation of the pure internal effects of the SMP policy in each country, abstracting from any global gain or loss coming from the external sector. Of course, the intra-EU trade and the trade with the RW change, under the SMP in the "constraint case", but this operates in such a way that the surplus or deficit (as a % of GDP) of each country with their trade partners remains unchanged.

The "flexible" and the "efficiency" simulation cases, remove the assumption about the external sector constraint and let the current account change in level and in % of GDP in all EU countries, as an indirect consequence of the SMP. Hence, there is no need to vary the real interest rate, that is assumed to remain unchanged in the simulations. These two simulation cases, accept by construction that terms-of-trade effects (for example net inflow from the RW), induced by the economy adjustment under the SMP, are possible in all the EU member-states. The allocation of activities and resources, induced by the SMP, has therefore more freedom to adjust, than in the "constraint case", by redirecting transfers to more attractive countries both for the EU and the RW.

In a sense, the "flexible" and the "efficiency" cases provide results about the SMP that are more likely to have occurred as a consequence of the SMP, than in the "constraint case". For example, empirical sectoral studies, within the "Single Market Review 1996" programme, confirmed that the SMP has implied net inflow of investment from the RW to the EU. Nevertheless, it can be also argued that these two simulation cases do not account for the possible re-adjustment of the rest-of-the-world attitude who may react as well, in view of the terms-of-trade changes with respect to the EU. Therefore, we consider that the range of results obtained from the "constraint" and the other two simulation cases is more valid than the individual results of any simulation case alone.

The "flexible" and the "efficiency" cases differ only in the representation of technical efficiency progress that has been partly induced by the SMP. The "flexible" case (and the "constraint case") considers that the acceleration of technical progress, as a consequence of the SMP, occurs in the production side of the EU economies. It is assumed (and confirmed by many specialised studies) that, as producers face increased competition, they accelerate the incorporation of innovations in their production process and their products, while under the enlarged market, they can choose among a bigger variety of commodities for their production and investment. In both cases, they improve in production efficiency. Given the complexity of this process and the lack of empirical evidence, it is assumed in the two simulation cases that the SMP induced in all sectors an exogenous gain in total factor productivity.

The "efficiency case" puts emphasis on the consumption side and only considers efficiency gains resulting from the increase in commodity varieties under the enlarged single market. Firms, in intermediate consumption and investment, private consumers and the government benefit from the availability of larger variety and can achieve efficiency gains, in the volume and costs of their consumption. In this simulation case, technical progress due to the enlargement of the market, is endogenously modelled, as an indirect consequence of the variety effect. The comparison of results from the "efficiency case" with those from the "flexible case", gives analytical insight about the role of the variety effect mechanism, in the SMP evaluation. As it will be shown below, it widens the range of numerical results about the impact of the SMP, hence improving robustness of conclusions. Of course, the "efficiency case" does not include the total factor productivity assumption, since if added on top of the variety effect, double counting errors would have been introduced in the analysis.

The analysis is completed by a set of sensitivity simulation tests. For example, the study constructed a set of simulations assuming that in the "anti-monde" there has been partial removal of SMP measures, as for example only regarding

border controls and not competition intensification. Such partial "anti-mondes" are built for analytical reasons, serving to evaluate isolated effects of individual measures. Additional sensitivity tests, for example regarding full capital mobility in the EU, or analysis of robustness of results regarding the assumptions in the numerical calibration of imperfect competition sectors, have been also undertaken.

Additional analysis effort was devoted, in the study, to the evaluation of long run properties of the results about the impact of the SMP. The question was to estimate, through model runs, which of the overall SMP effects are transitory and which are likely to leave permanent traces on the EU economy. For this purpose, the "efficiency case" was simulated over a longer time period, in fact over 20 years, so as to approach a steady state solution of the model.

### **Results: evaluation of the SMP**

- The results and sensitivity tests generally suggest that the SMP has induced real activity gains and augmented the volume of intra-EU trade. According to the model results, and by considering the range estimated from the three main simulation cases, as mentioned above:
- EU GDP in 1994 is estimated to have been 1.1%-1.5% higher due to the Single Market leading to a cumulative net gain ranging from 174 to 207 billion ECU in the period 1988-1994.
- Real GDP increase is supported by a higher level of investment, increasing by 2.5%-4.5% and consumption increasing by 0.8%-1.6%.
- Employment is also higher indicating the creation of 320-620 thousand new jobs, in 1985-1994, which represents, however, a small increase in total employment (0.25%-0.49%).
- The volume of trade has increased significantly, intra-EU trade for example, is found 4%-5% higher in 1994. Trade creation is also observed in the relations with the rest of the world.
- In the manufacturing sectors the increase in intra-EU trade is even higher (7%-8%) accompanied by higher industrial concentration and falling price/cost margins (0.8%-0.9%) because of increasing competition. Equipment goods, construction and building materials are found to gain more from the SMP, than intermediate (metals, chemicals) and consumer goods. This is related to investment that boosts significantly more than private consumption.
- Among the service sectors, noticeable is the performance of telecommunication and banking services that achieve 12%-18% higher intra-EU trade and 4.0%-6.0% lower fixed costs.
- Relative to a non-EU foreign numeraire, the SMP induces a general decrease in domestic prices (reaching -0.6% down to -1.1% in 1994), as a result of the combined effects of efficiency gains in trade and production that overcompensate pressures on prices from the higher level of activity.

The main effects of the SMP are summarised in the following table.

<b>Effects of the SMP on EU-11</b>	<b>Constraint Case</b>	<b>Flexible Case</b>	<b>Efficiency Case</b>
GDP	+1.10%	+1.26%	+1.46%
Private Consumption	+0.82%	+1.53%	+1.60%

Total Investment	+2.67%	+4.52%	+4.53%
Total Intra-EU trade	+3.99%	+4.63%	+4.74%
Employment	+0.25%	+0.48%	+0.49%
Labour productivity	+0.32%	+0.77%	+0.97%
Consumer Price Index	-1.19%	-0.74%	-0.65%
Real Wage Rate	+1.43%	+1.67%	+1.87%
Average Mark-up	-0.79%	-0.92%	-0.92%
Current account as percent of GDP	0.00%	-0.68%	-0.62%

**Note:** Numbers indicate percent changes between "monde" and "anti-monde" except current account which is absolute difference. The figures presented in this table refer to the last year of the simulation (i.e. 1994) of the three full "anti-monde" scenarios.

If the current account as a % of GDP is not constrained in the simulations, as in the "flexible case" (and the "efficiency case"), the EU economy is attractive for exporters from the rest of the world who bring resources in the EU contributing to increase activity, which boosts from the realisation of the SMP. In this case, investment also increases, allowed to take its full amplitude. Gains from terms-of-trade effects, coming from the RW, are obtained in this case, and these are added to the gains from the SMP.

If the current account as a % of GDP is restrained from varying as a consequence of the SMP, as in the "constraint case", the real interest rate increases to discourage investment and consumption so as to limit the needs for support of domestic activity from the rest of the world. Obviously this reduces real growth effects but also contributes to lowering domestic prices. Terms of trade effects vanish, but real activity gains that are due to the better allocation of resources induced by the increased competition under the SMP remain.

As explained, "the constraint case" measures the effects of the SMP on the domestic EU economy alone, as a consequence of domestic readjustments. The results are suggesting clearly positive "pure" effects of the SMP for domestic activity and prices. Terms-of-trade gains from the RW largely explain the additional GDP effects, found in the "flexible case", compared to the "constraint case".

The "efficiency case", includes the "pure" gains from the SMP (as in the "constraint case"), the additional gains from terms-of-trade (as in the "flexible case") but also an amplification of positive growth effects, as it induces efficiency gains through consumption, for which a bigger variety of commodities is available in the enlarged EU market. To avoid double counting, the "efficiency case" does not include the total factor productivity assumption, that has been introduced in the other two cases. Regarding the representation of the technical progress induced by the SMP, the "efficiency case" simulation is considered as an alternative to the simulations that accept an ad hoc total factor productivity assumption. The variety effect, endogenously present in the "efficiency" scenario only, acts in favour of moderating the upwards pressures on prices limiting the need for imports from the RW and releasing more domestic resources for consumption and investment.

The distributional impact of the SMP on the EU economic sectors are also worth mentioning. Given that investment is found to boost more than consumption, as a consequence of the SMP, sectors related to investment, such as equipment goods, construction and building materials, benefit more from the policy, in terms of activity and efficiency gains. EU production of consumption and agricultural goods is found stable, while chemicals and metal products slightly lose their share in the EU market. The activity of service sectors, albeit losses in activities related to the support of trade, progresses under the SMP and an internal EU trade market for services is found to be emerging.

The partial "anti-monde" runs indicate that the removal of border controls and the efficiency in trade costs, if taken alone, mainly induce trade creation effects, leading to 2.6% more intra-EU trade, accompanied by a reduction of prices. GDP effects are positive but very small.

The enlargement of the market, higher competition and the increased substitutability among the EU commodities also contributes to trade creation (less than the border controls), but constitutes the main cause of real GDP, employment and investment growth effects.

Efficiency gains in the production side (X-efficiencies in sectors and total factor productivity gains) explain a small part of the achieved GDP growth: they account for 0.2% of extra GDP, in the "flexible case". The "efficiency case" explaining technical progress from the variety effects on efficiency gains, leads to a similar, even higher, performance.

The trade creation effects were found robust in all sensitivity tests. The results about real GDP growth, higher employment and higher investment effects from the SMP were also found robust in the tests. However, these results were found to vary in magnitude, though in the positive side, depending on the numerical calibration of imperfect competition sectors and the model's closure rule.

The long run simulation that approaches the steady state of model dynamics, suggests that although the effects through foreign trade of the EU with the RW tend to re-equilibrate, indicating that the terms-of-trade effects are transitory, there are permanent effects from the SMP that remain in the EU economy in the long term, regarding GDP growth, investment, employment, production cost efficiency and the intra-EU trade. The long run effects are found to be even more favourable for the evaluation of the SMP.

## Limitations of the Study

First there is a fundamental limitation, arising from the fact that economics is not an experimental science. Since we cannot "see" the "anti-monde" experiment, our separation of changes into SMP-induced and non-SMP-induced effects involves a certain degree of arbitrariness.

A second limitation comes from the poor statistical observation of the "monde" that decreases the reliability of the dynamic calibration. Perhaps structural changes not encountered in the statistically incomplete view of the EU could lead to a different quantitative ex-post appraisal of the SMP, although unchanged in qualitative terms. The quantitative evaluation could be also more accurate, if updated engineering cost information on the imperfect competition sectors were available.



One of the issues that are incompletely covered in this study, regards the effects of the SMP on price convergence. This is due to the particularities of standard CGE models, as they are calibrated on a single base year, for which they assume unit prices in all sectors and countries. Therefore information about initial differentials in prices across countries and sectors, is not basically incorporated into the model information, except those related to economies of scale potential in the imperfect competition sectors. These only contribute to price convergence, which has been also confirmed in the study results.

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(1) The GEM-E3 model was constructed by a collaborative project team, partially financed by the Joule Programme of the European Commission (DG-XII/F1, directed by P. Valette), and involved NTUA as a co-ordinator, KUL/CES, University of Toulouse, University of Mannheim, University of Strathclyde and CORE.

(2) Such studies were commissioned by the European Commission within the "Single Market Review 1996" programme of DG-XV and DG-II.

(3) This mainly concerned time series and Input-Output tables for the EU member-states, covering the post 1985 time period.

(4) Such a modelling choice corresponds to the model's closure rule regarding the external sector.



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