

THE EFFECT OF DIRECT PAYMENTS OF THE OECD COUNTRIES IN WORLD AGRICULTURAL MARKETS. EVIDENCE FROM PARTIAL AND GENERAL EQUILIBRIUM FRAMEWORKS

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Abstract: The effect of decoupled payments granted to Oecd farmers on world agricultural markets is one of the controversial issues surrounding the Doha Development Agenda. The paper aims at providing additional evidence on the range of effects that such payments may determine under general and partial equilibrium assumptions. Simulations are run on a modified version of the model of the Global Trade Analysis Project (GTAP). Scenarios hypothesise the removal of decoupled payments only, and of all domestic support in Oecd countries; they are run on a baseline referred to year 2004. Results indicate that only few developing countries would gain substantially from the removal of decoupled payments and of domestic support in general; rather, few major exporters may gain substantially, including some of the Oecd countries themselves. Impact is sensitive to the modelling approach, and the partial equilibrium closure rule produces systematically a higher impact than the general equilibrium one in both the scenarios. Results are compared to those of other quantitative assessments, particularly the evidence recently produced by the Co.Si.Mo. project, run jointly by the Oecd and FAO.

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* The opinions and judgements expressed in this paper only reflect those of the author, while they do not reflect those of FAO or its member governments.

1. Introduction

The effect of the so-called decoupled payments on agricultural markets is one of the controversial issues surrounding the Doha Development Agenda, which is generating considerable discussion both in the negotiation and in the technical literature (Cahill, 1997; Beard and Swinbank, 2001; Dewbre *et al.*, 2001; OECD 2001a; 2001b; 2004; Young, and Westcott, 2000; Gohin *et al.*, 2000; Burfisher and Hopkins, 2003; Sckokai and Moro, 2002; Guyomard *et al.*, 2004; Andersson, 2004; FAO, 2005a).

In the negotiations, a number of countries have more or less directly expressed worries about the possibility that the distortionary effects of such payments may be higher than what it is implied by the current WTO rules, for instance by proposing to place a cap on the “green box” measures, as the G20+ group did in 2003.

Given that payments require fiscal capacity whereas tariffs do not, a danger is for the WTO to be wrongly perceived as a club in which those who can afford payments are allowed to distort markets by substituting border protection with decoupled transfers, while those who cannot are just forced to reduce tariffs.

In fact, much is likely to depend on the particular policy mix which is enacted, and the matter is mostly an empirical one: the judgement on the extent to which a particular payment does affect producer’s behaviour depends the data, the parameters utilized, the type of the analytical approach employed, and the modelling of the payments.

The paper aims at contributing to the debate by providing additional evidence: (i) on the range of effects of decoupled payments under general and partial equilibrium assumptions; (ii) on their interaction with coupled payments; and (iii) by comparing the evidence generated with similar results generated by other quantitative assessments. Particularly, results are compared with those produced by the Co.Si.Mo. project, run jointly by the OECD and FAO (2005a).

The potential effects of Oecd decoupled payments in world agricultural markets is studied here through a set of simulations performed with a modified version of the model of the Global Trade Analysis Project (GTAP) (Hertel, 1997). The two policy scenarios considered include, respectively, the removal of the decoupled types of subsidies only, and both the coupled and the decoupled payments. These are assessed against a baseline referred to year 2004, which includes recent agricultural policy developments in a number of countries, including the Eu, the Us and China.

Each of the two policy scenarios is simulated both with a general equilibrium and with a partial equilibrium model closure. Some key parameters are modified to take into account empirical evidence on factor’s market provided by OECD (2001b), and results are subject to a systematic sensitivity analysis with respect to key parameters, allowing to estimate a mean and a standard deviation of the value of endogenous variables through repeated model solutions.

The paper is organized as follow. A brief recall of the literature results is presented in next section, which also introduces the logic of the scenarios simulated. The following section describes briefly the model, and the modifications implemented in the version employed, together with the main choices undertaken in the construction of the baseline, while section 4 reports the results of the simulations. In this part, a sub section is devoted to the comparison with the results of FAO (2005a). The last section contains few concluding remarks.

2. Decoupled payments: from the technical debate to the WTO negotiation

A useful categorization of all direct payments has been produced by the OECD (2001a; 2001b; Dewbre *et al.*, 2001; Anton, 2004). This includes 1. input price support, 2. market price support, 3. payments based on land, 4. payments based on historical entitlements, and 5. payments based on individuals characteristics not related to farming. Among these, the first two are commonly referred to as coupled measures, while the following four are referred to as more or less de-coupled payments. They are listed above according to a increasing degree of de-coupling.

While there is consensus upon the idea that types 3. 4. and 5. are likely to be less distortionary than 1. and 2. types, there is less consensus on the extent to which the former three groups of measures do in fact affect production decisions. Their effect has been studied starting from two extreme cases: the one in which measures are “fully coupled”, and the one in which measures are “fully de-coupled”. Full coupling is somehow easier to define, as payments directly affect the price effectively received and /or paid by farmer and consumers; therefore these agents will fully take into account the policy in their decisions. Two definitions are available for the other extreme (OECD, 2001a):

- a strong one – full de-coupling - which implies that supply and demand schedules do not change when the payment is introduced, a condition which is virtually impossible to observe in a world characterized by market imperfections and frictions;
- a weak one – *effective* full de-coupling –which implies that supply does not exceed the level that would materialize without the policy, although the shape of supply and demand curves may be different before and after the policy is implemented¹.

In between these two extremes there are the four types of measures listed above - payments based on land, payments based on historical entitlements, and payments based on individuals characteristics not related to farming - whose adoption implies that supply exceeds the level that would exist without them, but does not exceed the level that would materialise if they were fully coupled measures. Assessing their impact is inherently an empirical issue.

Existing de-coupled payments are deemed to affect supply in at least four different ways (OECD, 2001a). Firstly, despite weaker, all the four types of payments listed above may have some degree of direct and cross product subsidization effect, however smaller than output and input payments, as only pure lump sum transfers do not have such effect. For input payments, it has been noted that those granted on the basis of land use have a limited effect on output, because the supply elasticity in the land market is usually small, whereas payments granted to intermediate inputs, such as e.g. fertilizers, can affect supply even more than output subsidies. Hence payment based on land are placed in a different category from payments to factor use in general (Anton, 2004).

Secondly, de-coupled payments imply an income effect. It has been shown that with an imperfect labour market, farmers would reduce labour supply in agriculture, and delay exit decisions beyond the level that would induce exit in absence of the policy (Guyomard *et al.*, 2004). Through exit decisions, payments may also affect the distribution of support across firms, and keep in production land which would be otherwise sold or idled (de Gorter, 2004).

Thirdly, decoupled payments affect the risk profile of agricultural activities, through a wealth effect and an insurance effect. The increase in wealth induced by the payments implies that farmers are willing to accept a higher degree of risk, if preferences are of the Decreasing

¹ This weaker definition implies that only equilibrium quantities and prices are unchanged with the introduction of the measure, and that a supply-reducing policy can be considered fully de-coupled (OECD 2001a).

Absolute Risk Aversion (DARA) type (OECD 2001a, Sckokai and Moro, 2002). Moreover, the payments reduce the level of uncertainty that farmers face, thereby acting as an insurance.

Fourthly, de-coupled payments imply a number of dynamic effects. The willingness of farmers to invest may increase if capital markets are not perfect, so that investment and consumption decision are not totally separated. Moreover, farmers can anticipate the future evolution of policies when taking their production decisions, at least to the extent to which they mature expectations on the persistence of policies through time. Both these effects depend upon the benchmark conditions: the perspective on future support and the level of investment may decrease if there is a switch from a less to a more de-coupled policy, while they may increase if there is a switch from a more to a less de-coupled policy.

On the basis of all these potential effects, three major points have been acknowledged: (i) that the assessment about the degree of decoupling of a measure needs to be context-specific, given that it depends on a number of parameters, on technologies and on factor mobility; (ii) that the modelling of payments should take into account as much as possible these four elements, not only de-coupled payments, but for all types of direct payments; and (iii) that the assessment of the degree of decoupling has to be conducted with reference to specific policy packages rather to single measures, as there may be significant interactive effects (Gohin, 2004).

Much work in this area has followed the major policy changes occurred in the Eu - from the McSharry reform, to the Agenda 2000 reform, and to the 2003 Fishler reform - in the US, with the FAIR Act and the FSRI Act, in Mexico, with the PROCAMPO programme. Measurements of the degree of decoupling, or policy scenario analyses involving changes in de-coupled payments, have been conducted within three main types of framework: (i) structural form econometric applications, sometimes run on farm-level data; (ii) aggregated reduced form models; (iii) aggregated reduced form models based on parameters derived by other more detailed models. An updated and comprehensive review can be found in Andersson (2004).

In the first group – examples are Moro and Sckokai (1999); Gohin *et al.* (2000); Young and Westcott (2000); Sckokai and Moro (2002) - land allocation and input demands are explicitly derived from a profit maximization problem which includes the decoupled payments and their access conditions. Behavioural parameters are estimated with respect to both prices and the payments, and the risk attitude of farmers is taken into account.

In the second type of exercises – those based on aggregated reduced form models, often larger in size – the partially decoupled nature of payments has been taken into account in two different ways: either by directly scaling down the effect of the payments, or by considering de-coupled payments as subsidies to primary factors use. The first of these two strategies employs direct observation and expert judgements to infer an overall percentage of decoupling (Westhoff, 2004), which is meant to subsume the difference in impact with an equivalent fully coupled payments. The second strategy, which is employed in the GTAP model and database (Hertel, 1997) has the advantage that the degree of de-coupling of payments is not fixed; however, its accuracy depends upon the modelling of the primary factor market, the related assumptions, and the accuracy of the parameters.

Examples of the third type of exercises are found in Burfisher and Hopkins (2003), in OECD (2004), and in FAO (2005a). Burfisher and Hopkins (2003) is based on a three-level analytical framework, in which: (i) farm level data on land ownership and rental, consumption, saving, investments, on-farm and off-farm labour force participation are employed to study the pattern of allocation of direct payments; (ii) the impact of decoupled payments on farm

households is estimated on the basis of cross section data; and (iii) the sectoral impact of decoupled payments is analyzed within a general equilibrium dynamic model.

OECD (2004) work is based on two models; the PEM (Dewbre *et al.*, 2001; OECD, 2001a) – a partial equilibrium framework which includes an extensive representation of the land market – is employed to estimate the extent to which decoupled payments affect production; results are plugged into the simulation with the larger size AGLINK model, assuming scenarios on the fixed “degree of decoupling”, and including a fixed risk factor derived from estimation of a truncated price probability distribution². The analysis run with the Co.Si. Mo. model (FAO, 2005a) is based on the same setting.

Results of the quantitative exercises show an overall impact on price formation ranging between few percentage points and about 10 percent. For instance, in a recent evaluation of the work undertaken to assess the effect in the EU of the 2003 CAP reform, Heckeley (2004) indicates an average range of projected price impact of about 2 to 4 percentage points for cereals, with few exceptions for some coarse grains; for beef, the same change would range between zero and 8 percent. Similar figures are reported by studies that have analyzed the international effects of decoupling; FAO (2005a) indicates around a 10% change in world price as the maximum impact projected, should all de-coupled payments be considered fully coupled. Van der Mensbrugghe and Beghin (2004) and Bouët *et al* (2005) show that on a global scale the distortionary effect of domestic support in general is small compared to the one arising from tariff protection in world agriculture.

Altogether, comparative analyses of the results of different modelling exercises show that (i) outcomes do not seem to be systematically different across partial and general equilibrium frameworks (Heckeley, 2004); (ii) rather, they appear to vary significantly with the benchmark of the simulations, and with the parameters employed (Gohin, 2004). Efforts have been undertaken at OECD (2001b) to discuss and organize the parameters available in the literature, highlighting the advantages of sensitivity analysis.

Given the importance of the topic in the ongoing negotiation within the Wto Doha Development Agenda, it is interesting to consider how this technical debate is related to the policy reform process. On this matter, it can be observed that the negotiation may benefit especially from reliable *ex ante* definitions of the degree of decoupling of each measure, allowing to classify them into the “boxes” set up during the Uruguay Round. That system, in fact, is aimed at cataloguing measures according to their distortionary effect.

The WTO (2004) Framework on the modalities in agriculture has indicated the need to monitor green box measures - in order to ensure that they really imply a minimum trade-distorting effects - and to review the eligibility criteria. This outcome can be considered as a compromise between two of the negotiating positions expressed in the months before the Framework was approved: that of the G20 group, which was proposing to place a cap on the Green box, and that of the EU and the US, that was proposing to stick to the present green box criteria. Few developments have taken place since July 2004; recently the G20 group has reaffirmed the need for more clarity on decoupling, and the need to avoid “box shifting”.

The exercise presented in this paper is based on the idea that identifying boundaries can be useful for the debate on domestic support and for the negotiation. Evidence on the overall distortionary potential can help identifying countries and products in which the actual policy mix which may determine a high level of distortion, and also to address countries’ concerns about the relative effects of different types of measures.

² Details are in the last Annex of OECD (2004); farmers are considered to face a price probability distribution truncated at the level at which intervention prices or other price-based safety nets are located.

The model employed here is fairly simplified compared to several others, but it allows to run experiment of a large size scale and to distinguish subsidies which are certainly coupled to production from those which are likely to exhibit some degree of decoupling, without predetermining a fixed level of decoupling.

3. Model and baseline

The simulation presented in this work are based on a modified version of the model provided by the GTAP, which is a perfectly competitive comparative static general equilibrium computable framework (Hertel, 1997). The structure of demand and supply, which is homogenous across regions and products, is built upon the Social Accounting Matrices of individual countries and regions, while parameters are mostly drawn from the literature and calibrated on the reference database period.

The model assumes the presence of representative consumers and producers together with a government sector, and all incomes are assumed to accrue to a single “regional” household. Therefore, distributional aspects are overlooked, and consumers are assumed to purchase all goods. By the same token, government costs and revenues do not need to balance, as it is assumed that any discrepancy accrues directly to the single “regional” household. Government’s consumption behaviour is endogenous, while policies are exogenous (Hertel, 1997).

Substitutability among primary factors and with intermediate consumption is modelled through a set of nested Constant Elasticity of Substitution systems, while the production of final goods is aggregated through a fixed coefficient function of the Leontiev type. On the demand side, the representative agent allocates income among savings, government and private consumption through a *Cobb-Douglas* utility function, while allocation across different private goods is modelled through a Constant Difference of Elasticity demand system (Hanoch, 1975).

Bilateral trade flows are modelled through products differentiation on the demand side, with the assumption of imperfect substitutability between similar goods produced in different countries and regions (Armington, 1969). Transaction costs are also accounted for in the model, as transport services are explicitly considered among the activities in the economy.

The model adopts the Walrasian closure rule, by which investment at the global level is adjusted to global saving, and the balance of payments is endogenous in individual countries and regions.

Decoupled payments are represented in the model as *ad valorem* subsidies to primary factor use, and particularly to land use for crops, and to capital use for livestock. This approximates decoupled support, and allows to distinguish it from those subsidies granted on output and on the use of intermediate inputs – type 1 and 2 in the OECD (2001a) classification - which are likely to affect more directly production decisions.

For the EU, the blue box payments reported in version 6 of the database are crop-specific - since this was their nature in the reference period, which is 2001 – and apply on land use for cereals and oilseeds, and on capital use for livestock. In fact, the operation of these payments implied that their level was reduced if actual cultivation would exceed a reference (“base”) area, or if the livestock inventory would exceed a maximum reference size. This was a financial stabilization mechanism, aimed at discouraging farmers to overinvest in the activities for which the payments were granted, and at limiting the effects of such subsidies in terms of market distortion. In order to take into account this mechanism in the model, we

added a condition by which the expenditure in each crop specific payment is exogenously fixed at the level of the base period, while the unit (*ad valorem*) subsidy is endogenously adjusted on the basis of the changes in output.

Full decoupling of direct payments in the EU – introduced by the 2003 Fishler reform - was represented in the model by introducing an homogeneous subsidy to land use, captured by an additional variable, whose level is determined endogenously on the basis of the expenditure arising in the baseline from granting crop-specific subsidies. With decoupling, such crop specific subsidies are eliminated, while the expenditure that they generate in the baseline is transformed in an homogenous subsidy to land, employed solely in agricultural activities, whose level is endogenous³.

The most recent available database version – known as version 6 – includes data up to a maximum of 87 regions and countries, 57 industries and 5 endowments, and is referred to 2001 as a base period. Among these, land and natural resources are assumed to be employed exclusively by agricultural and food production, while capital is assumed to be fully mobile among countries and regions.

The database was adjusted for this application to include 47 regions, 15 products and 5 endowments (Table 1). The attempt was made to maximize the number of WTO members, of countries classified as Least Developed Countries (LDCs), and/or Low-Income-Food-Deficit Countries (LIFDCs) explicitly included in the analysis.

The CEEC aggregate includes all the ten countries which became members of the EU in 2004. Lack of consistent data forced to include seven residual areas (Table 1) plus a wider and even more heterogeneous “rest of the world”. Products were chosen with emphasis on agriculture and food, attempting also to strike a balance between those more directly of interest for the major agricultural economies and to the low and middle income countries. For some products data is available at different processing stages; this is the case of rice, oilseeds, and dairy.

Since the database is referred to year 2001, a number of shocks have been implemented to update the baseline to year 2004. GDP, population, labour force and total factor productivity were shocked up to the levels reported and/or projected for year 2004⁴. A number of policy shocks were also implemented to build the 2004 baseline, accounting for some of the most important changes occurred in agricultural since 2001, particularly concerning direct payments.

The Common Agricultural Policy of the EU was considered, which has undergone significant modifications over this period: in 2001 only two thirds of the “Agenda 2000” reform was implemented, while in 2003 the so called Fishler reform was introduced. Moreover, the enlargement of the EU, and the related extension of the CAP to ten new members was taken into account. We included a simplified representation of the market measures of the US FSRI Act, which was introduced in 2003, and changes in the PROCAMPO programme implemented in Mexico in 2003. China’s introduction of direct payments in 2003 was also

³ The Commission has left member countries room to decide the extent to which and the time horizon over which payments - to cereals, oilseeds, the beef slaughtering premium, and the other payments for beef – have to fall within the unique farm level payment. Most countries have so far indicated that will decouple the vast majority of the subsidies, therefore it was assumed that all of them would opt for full decoupling. New member countries do not have such option.

⁴ Change in GDP are retrieved from the World Bank World Development Indicators projections, adjusted by the USDA/ERS with the projections of the Oxford Economic Forecasting, DRI-WEFA, and of the Project Link; Changes in the population are those published by the United Nations. Agricultural labour force is taken from FAOSTAT. Total factor productivity is supplied by Hertel and Martin (2000) on the basis of a literature review on the topic.

included. Details of the policy shocks employed in the building of the baseline are reported in Table 2.

Changes in the Eu intervention prices for rice, cereals, and dairy products have been approximated through changes in the corresponding import taxes. Output quotas for milk have been modelled by setting production exogenously at the level of the base period, and checking after model runs, that this limit was effectively binding⁵. Shocks aimed at representing the enlargement of the EU to the new ten Member States include the removal of all import tariffs between the EU and the CEECs, and the alignment of all export, output and input subsidies and taxes reported in the database. Concerning the extension of direct payments, they were introduced in the CEECs in terms of 25% of the level of the Eu 15, as scheduled for the year 2004⁶. Since payments are determined in nominal terms, they were deflated at a 2% per year rate, in order to take into account their reduction in real terms.

Concerning other countries' policies, some of the provisions of the FSRI Act, which was implemented in the US in 2002, were included in the baseline. Policy shocks were introduced following mostly Bouet *et al.* (2005). A reduction in land productivity was introduced to take into account the increase in the acreage conservation program. Output subsidies were increased for cereals - taking into account a 3% increase for coarse grains and a 6% increase for wheat - and for dairy products, by 3%. A 4% decrease was implemented for soybeans.

Also the decoupled payments of the PROCAMPO program in Mexico have been increased in 2004, by 3% and by 9% respectively for farmers with more and less than five hectares of land (FAO, 2005b). A weighted average increase has been considered, based on Eastwood *et al.* (2004). Finally, the recent introduction of direct payments in China was also taken into account, by considering a reference of about US\$ 36 per hectare in 13 provinces, which are among the most important for grains production (FAO, 2005b). An *ad valorem* subsidy to land use in cereals, rice, and oilseeds was introduced, taking into account the share of the 13 provinces in total arable land.

On this baseline, two policy simulation scenarios were run. The first, named "decoupled payments only", includes the removal of subsidies on land and capital use and those related to historical payments or historical land uses in the EU. The second scenario, named "coupled and decoupled payments" includes the removal of both the above subsidies and of output subsidies.

Since the functioning of factor markets is key in determining the effect of de-coupled payments, these two policy scenarios were combined with two different closure rules: a general equilibrium (GE) one, and a partial equilibrium (PE) closure which excludes non agricultural goods and factor markets, and neglects the Walras Law. This last setting was chosen also to facilitate the comparison with the result of agricultural PE models.

Parameters were modified following indications reported in OECD (2001a). Particularly, the elasticity of transformation for land, which takes into account the frictions in switching land from one crop to another, was set at a starting value of -0.5, while the elasticity of substitution between value added and intermediates was set at 0.5 for agricultural products and at 0.75 for food products.

Model results were subject to systematic sensitivity analysis with respect to key parameters, to yield a measure of their reliability. The procedure involved solving the model several times with parameters varying by 50% above and below their starting values, according to a

⁵ This prevents the quota to act as a minimum rather than as a maximum constraint on output.

⁶ The calculation of the equivalent subsidy in *ad valorem* terms was approximated on the basis of the Co.Si.Mo. and the GTAP databases.

uniform probability distribution. Given the size of the model, the Stroud Gaussian Quadrature was employed to reduce the number of runs⁷. The parameter involved in the analysis are: the elasticities of substitution between domestic and imported goods, i.e. the so-called Armington elasticities; the elasticities of transformation of land, the elasticity of substitution between value added and intermediate goods in production, the expansion and the substitution parameters of the demand schedule.

The many limitations of the analysis performed in this paper are highlighted by the comparison between the complexity of potential effects of decoupled payments, highlighted in the previous section, and the simplified representation proposed in the model. Dynamic effects, risk effects, wealth effects, and distributional effects are not taken into account.

4. Results

4.1. The impact on factor markets, product markets and welfare⁸

With the GE closure, one of the more evident outcomes of the removal of decoupled payments in Oecd countries is the reduction of land prices (Table 3), which is consistent with the expectations of a reduced rent for land and capital owners. As subsidies to land and capital use in agriculture are eliminated, the use of these endowments becomes more expensive for producers, while returns to landowners become less rewarding. Therefore land is relocated across agricultural activities, while capital and labour – both skilled and unskilled – substitute for land to some extent, and migrate towards non agricultural activities. In the simulations, this determines a substantial decrease in the prices of land in the Oecd countries – where subsidies are removed - while the prices of other primary factors increase marginally. New Zealand is an exception, since it grants no subsidies to land use in the baseline, and therefore behaves exactly like non Oecd countries. In most non-Oecd countries, land prices exhibit an increase reaching 1% as a maximum, arising from the increased demand from farmers. When also the output subsidies are removed, land prices changes according to the extent to which the reallocation of production across more or less subsidized sectors decreased or increases the demand for land. However, the additional effect on land price is small in most instances.

In the product market, average world import prices decrease as expected (Table 4), but there are substantial differences between the results generated with the PE and GE closure, and between the two policy scenarios. Particularly, the GE experiments systematically indicate a smaller impact on world prices, with minor exceptions in the scenario in which all domestic subsidies are eliminated. In the GE setting, instead, changing conditions in the factor market, together with the constraint of the Walras Law and the presence of non agricultural activities reduce the overall effect on agricultural prices. With the PE closure, results of the two scenarios are quite similar, as it can be expected given that most subsidies in the Oecd countries are partially decoupled, and hence reported in the Gtap database as subsidies to land and capital use.

More insights on the difference between the results generated with the PE and the GE closures can be gained by looking at changes in supply, and at how production changes are distributed across activities (Tables 5 to 8).

⁷ A Gaussian quadrature is a procedure based on the optimal choice of the best possible shocks in N simulations given the distributions of M exogenous variables allowing to minimize models runs necessary to estimate a mean a standard deviation. Stroud's quadrature involves approximation of the simulations' results through a third-order polynomial.

⁸ The Tables attached to this section only report a selection of the results of the simulations. In the text, reference is made from time to time to other results, which are not in the Tables, but are available upon request.

The extent to which the removal of Oecd subsidies on land and capital use - both with the GE and the PE closures - results in a decrease or in an increase of production depends upon the distribution of such subsidies across products, and on the distribution of coupled subsidies; with the GE closure, a third determinant becomes the substitution among primary factors and the resulting changes in their relative price.

The effect on supply is concentrated mainly on cereals and oilseeds, and to a lower extent on plant based fibres, rice and the fruits and vegetables sector. Most of the wider changes take place within Oecd countries, while spillover effects to other countries are smaller in size in most cases.

In the “decoupled payments only” scenarios (Tables 5 and 6), with the GE closure the prices of capital and labour in other activities increase, particularly in the secondary sector, because both of them substitute for land in agriculture. This reallocates production both within agriculture, especially towards more extensive productions, and across other activities, especially in the manufacturing sector. With the PE closure, instead, substitution among primary factors is not taken into account and their price is fixed, nor it is taken into account factors migration toward non agricultural activities; all the impact of the reduced land subsidization is distributed within the agricultural sector, and therefore the effect is generally wider.

For instance in the EU, where most of the subsidies are enclosed in the homogenous fully decoupled payment implemented in the baseline, the impact is also quite homogenous. With the PE closure the impact is generally negative for virtually all sectors, while with the GE the impact is equally homogeneous although very small, as labour and capital substitute for land - whose return diminishes - to a homogenous extent across agricultural activities, and there is a small increase of production in the secondary sector.

In the Usa, instead, where the decoupled payments reported in the baseline are more diverse across products, their removal determines less homogeneous results. With the GE closure, oilseeds production increases, since substitution among the primary factors together with a specific output subsidy reported in the baseline, drive more land into the cultivation of these crops. With the PE closure this is not the case, and land employed in oilseeds production decreases.

In non Oecd countries, production generally shows an increase with the removal of decoupled payments, and once more the impact is larger within the PE setting compared to the GE one. Product-wise, the increase materializes mainly for cereals, but also for oilseeds, fruits and vegetables, rice and plant based fibres, especially with the PE closure rule. Output would increase especially in Latin America, and to a smaller extent in Asian countries. Developing countries of Sub Saharan Africa show relatively small gains, while the Northern Africa would fare better, together with the South African Custom Union. China and India show negligible effects – at least in percentage terms - from the removal of decoupled payments in the Oecd countries. Output of cereals in Argentina and Brazil would increase by 2 percent in the GE setting, which would amount to a substantial change, while the increase in fruits and vegetables production in North Africa does not appear to be significantly different from zero.

The impact in Australia and New Zealand is similar - as it was the case for land prices - to that of non Oecd countries: agricultural production increases with both the PE and the GE closure, with the exception of dairy products, whose output is reduced in all scenarios.

The removal of both coupled and decoupled forms of support (Tables 7 and 8) implies, as expected, a larger impact on supply, particularly for oilseeds - whose production would diminish in the Usa with both the PE and the GE closure - but also for cereals, rice and the

group of plant based fibres. As a consequence, output growth in non Oecd countries would be far more substantial, and far more widespread. For instance production of oilseeds in China would be 3 percent higher in the GE setting, and paddy production would be almost 2% higher in India. Output of plant base fibres would increase substantially in a number of developing countries, including Sub Saharan Africa and South Asia. The fruits and vegetable sector, instead, would not experience less marked changes, especially with the GE closure, probably because direct payments in general, and input subsidies in particular, are less common. The behaviour of trade flows, as expected, is largely consistent with the changes observed in supply.

Coming to welfare effect, this is decomposed following Huff and Hertel (2000), into two major components, which are referred to the changes in factor allocation, and to changes in the terms of trade respectively. This break down is reported in Table 9, where information on individual countries is organized following the major groups which have emerged in Wto negotiations⁹.

Total welfare increases with all closures and scenarios only in the USA, Canada, Argentina, and Australia, and in the world as a whole. The gain of USA Canada and Argentina are due both to an improved allocation of resources, and to more favourable terms of trade. Australia, instead, appears to have no margins to improve efficiency, so it only gains through its terms of trade (Table 9).

The procedure in Huff and Hertel (2000) allows to relate the changes in each of the four component mentioned above to products and to the type of tax or subsidy which determine them. This allows to gain more insights on the outcomes for individual countries.

In the case of China, for instance, the simulation shows that when both coupled and decoupled subsidies are eliminated, the allocative efficiency component is negative, due to the emergence of the distortionary impact of trade protection, which prevents consumers to benefit from lower import prices. The terms of trade component, instead, is positive only with the GE closure, and when input payments only are eliminated in the Oecd. The negative outcome arising from the terms of trade – which is due to export prices of cereals, oilseeds and rice increasing more than the corresponding export prices – is more than offset by a positive performance in the manufacturing. By definition, this cannot happen with the PE closure, and therefore the outcome is a worsening of the terms of trade. Similar reasons determine the welfare results for India, for which both the allocative component and the terms of trade effects are positive only in the GE framework.

Other Latin American and Asian countries show negative welfare results, particularly Taiwan, Indonesia, Malaysia and the Philippines, Colombia, Venezuela, Peru and the “rest of the Andean Pact” which includes Ecuador and Bolivia (Table 9). In many of these countries the terms of trade effect is frequently larger than the allocative one: this indicates that the advantage in terms of increasing world prices is mostly captured by few large agricultural economies, such as Argentina, Brazil, and by some Oecd countries such as Canada and Australia. In more than one case - particularly Brazil – the potential gain only arises under the GE setting. Africa is virtually unaffected under all scenarios, with the exception of the South African Custom Union, which gains marginally in the GE setting.

The EU is the only country in which a welfare gains arises with the PE closure rule, while a loss arises in the GE setting, due to both the terms of trade and the allocative components (Table 9). In this latter component, the reduction arises because the positive effect due to the

⁹ Note that the database only allows to approximate the total results for each group, as many countries are not explicitly taken into account, and many aggregates include countries belonging to different groups.

reduced subsidies on land and capital use is more than offset by the negative effect arising from reduced consumption. Total consumption expenditure decreases because the change in relative prices determines a growth in consumption of agricultural goods which is more than compensated by a decreased consumption of manufactured goods, and of services. With the PE closure, the decrease in total consumption does not appear, and therefore the change in the allocative welfare component is positive, and larger than the negative terms of trade one.

Finally, considering the country groups which have been relevant in the Doha negotiations (Table 9), it is clear that the only group which would definitely gain from the policy scenarios are the Oecd countries themselves, with the exceptions of Japan and South Korea. All the other groups show widespread losses, and even in the Cairns group the total outcome is positive only under the GE setting, and only for Brazil, Argentina, Chile and the South African Custom Union.

4.2. A comparison with the results of the Co.Si. Mo. model

Some of the results generated with the PE closure can be compared with the results of a somehow similar assessment of the effect of decoupled payments that was preformed on the basis of the Co.Si.Mo. model (FAO, 2005a). Co.si.mo. is a recursive dynamic partial equilibrium framework, partly built on the basis of the AGLINK model of the Oecd. Decoupled payments which are granted in the Oecd countries are modelled as in (OECD 2004): they are included in the definition of an effective producer price, in which they count as a fixed share of the value of the payment - derived by estimations conducted with the PEM model (OECD, 2001a) - and a risk factor. The scenario analysis in FAO (2005a) is aimed at exploring the range of potential impact under two polar assumptions, against a base projection in which policies are assumed to be fully decoupled, and therefore have no impact on model's results by definition.

The two scenarios are the following: 1. payments are partially decoupled, as defined in OECD (2004); and 2. payments are fully coupled, and hence modelled exactly like an output subsidy, with both the share and the risk parameter equal to one. Those two scenarios are employed in Co.Si.Mo. to assess the range of the potential impact in terms of changes in world prices, supply and trade.

Some of the results presented in FAO (2005a) appear quite similar in terms of order of magnitude, to those generated in this work. This is the case of the “decoupled payments only” scenario, run with the PE closure here, and of the second scenario run with Co.Si.Mo., particularly for changes in world prices¹⁰. For rice, price projected by the Co.Si.Mo. indicate a 3.5 percent change, which is not far from the 4.6 percent reported in Table 4 for paddy. For oilseeds Co.Si.Mo. projects a 3.7 percent change, which is not far from the 4 percent reported in Table 4; the same applies to dairy products and livestock, for which the simulation with Co.Si.Mo. projects a 2 to 3 percent change in world prices.

The “worst case” scenario run with the Co.Si.Mo. model (FAO,2005a) generates results which are similar to what is obtained here with the PE closure by removing only subsidies which are deemed to be at least partially decoupled. This may be only an apparent contradiction: if primary factor markets are not considered - as it is the case in the two experiments under comparison - the “degree of decoupling” is approximated through a fixed

¹⁰ Note that the direction of the world price changes is reverted compared to the experiments run in this paper, because the scenarios are reverted: in FAO (2005) it is simulated the introduction rather than the removal of decoupled payments. The results are symmetrical in both models.

effect, given by the change in the share of land and capital values in total costs that follow from the removal of subsidies. This change must fully affect production decisions.

However, two *caveat* should be made concerning this comparison. Firstly, prices which appear in Table 4 are not, as in the case of the Co.Si.Mo. model, equilibrium prices. Rather, given the Armington assumption adopted in the Gtap, they are a trade-weighted averages of bilateral import (cif) prices in all countries. Secondly, the results of Co.Si.Mo. are referred to year 2010 - since in that (dynamic) framework it is assumed that the adjustment of endogenous variables is completed by that year - whereas the results of this paper are referred to a counterfactual scenario in year 2004, as the model is comparative static.

5. Concluding remarks

The type of modelling approach appear to account for significant differences in the results: lack of consideration of primary factors markets and non agricultural products overstates the distortionary impact of direct payments in general, and the GE approach appears to provide more complete information despite its larger requirements in terms of data and simplifying assumptions. Despite exactly the same parameter set was used, lack of consideration of factors markets, of non agricultural markets, and the absence of the overall constraint provided by the Walras Law result in an amplification of the impact on agriculture, and in an increase of the estimated distortionary impact of decoupled payments on world prices and in developing countries markets.

In this respect, the GE approach appears to provide a more complete assessment, notwithstanding its higher complexity and its wider requirements in terms of data and simplifying assumptions. The benefits of considering economy wide effects appears even more evident for developing countries, where inter sectoral linkages and budget constraints are key ingredients of any development strategy.

In terms of size of the distortionary effects, the exercise presented here appears not to be far from the order of magnitude found in other quantitative assessments. In the case of the Co.Si.Mo. model results (FAO, 2005a), changes in world market prices projected by that model under the assumption that decoupled payments are fully coupled are similar to those projected here with the PE closure, assuming that decoupled payments only are removed. This outcome appears consistent, since once factor markets are not considered, changes in land and capital prices may fully affect production decisions: the “degree of decoupling” of subsidies to land use is only given by the low elasticity of this particular factor. This appears, indeed, as one more element in favour of the GE approach.

Considered together, coupled and decoupled payments can result in a high overall level of distortion, despite the separate effects of the types of subsidies may be small. This is shown by the difference in the impact observed between the scenarios: removing all coupled and decoupled subsidies together often implies a different direction of the change in market prices and supply compared to the removal of decoupled subsidies only, together with wider changes.

Decoupled payments granted to the Oecd agricultural producers are most probably distorting world markets to some – most probably limited - extent, but apart from few exceptions, most developing countries do not appear to be those which are suffering more from this distortion, and therefore very few of them appear set to gain substantially from increased discipline in this area. Rather, the removal of the whole set of direct payments appears to make a significant difference, particularly in products and countries in which the combination of coupled and decoupled measures results in a high level of support. If any, in the hypothetical scenarios in which all - decoupled and/or coupled - payments would be eliminated in Oecd

countries, winners could be few major exporters like Argentina, Brazil, together with the Oecd countries themselves.

Finally, it is worth highlighting that the results have confirmed the extent to which the distinction between less and more distortionary policy tools in the Wto can be substantial. The potential effects of decoupled payments on world markets are significantly different from those of coupled measures, despite this distinction may *de facto* appear to discriminate against poor countries that lack the budget resources and the administrative capacity to implement these kind of measures.

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Table 1. Countries, regions, products and endowments

country/regions	products	primary factors
China	paddy rice	land
Japan	processed rice	skilled labour
South Korea	other cereals	unskilled labour
Taiwan	oilcrops and products	capital
Indonesia	vegetable oils	natural resources
Malaysia	vegetables and fruits	
Philippines	pland based fibers	
Thailand	other primary products	
Vietnam	sugar cane, beet and products	
Bangladesh	livestock products	
India	raw milk	
Sri Lanka	milk and dairy	
Rest of Asia	other food products	
USA	secondary sectors	
Mexico	services	
Canada		
Colombia		
Venezuela		
Peru		
Rest of the Andean Pact		
Argentina		
Brazil		
Chile		
Uruguay		
Rest of South America		
Central America		
Rest of FTAA		
Rest of the Caribbean		
European Union 15		
Ceec		
Turkey		
Russian Federation		
Rest of the Middle east		
Morocco		
Tunisia		
Rest of North Africa		
S. African Cust Union		
Tanzania		
Mozambique		
Other Southern Africa		
Madagascar		
Uganda		
Malawi		
Rest of S- Saharan Africa		
Australia		
New Zealand		
Rest of the world		

Table 2. Policy shocks for the 2004 baseline

policy measure	shock	sources of shock calculations
reduction in the cereals intervention price (residual of the application of Agenda 2000 reform)	import tariff reduction	corresponding to market price reduction as a % of intervention price reduction in Van Meijil and Van Tongeren (2002)
increase in the (semi-decoupled) payment per hectare to cereals producers (residual application of Agenda 2000 reform)	increase in the subsidy to land use	+5% (one third of change from 54 to 63 Euro/ton)
reduction in the intervention price of butter and smp (Fishler reform 2003)	import tariff reduction	-22% as trade weighted average of butter and smp
50% reduction in the intervention price of rice (Fishler reform 2003)	import tariff reduction	-50%
increase in direct payments to rice producers	increases in subsidies to output and to input use	37% output subsidy and 96% increase in subsidy to land use
abolition of bilateral tariffs and export subsidies between the Eu15 and the ceec		
equalization of all input and output subsidies between the Eu15 and the ceec		
equalization of all bilateral tariff and export subsidies toward the rest of the world		
full decoupling of direct payments in Eu 25 between the Eu15 and the ceec	reduction of crop specific subsidies to land and capital use, introduction of a homogenous subsidy to land use	
increase in output subsidies to cereals (FSRI Act)		weighted average of 6% for wheat and 3% for coarse grains (Bouet et al, 2005)
reduction in the output subsidy to soybeans (FSRI Act)		-4% (Bouet et al, 2005)
increase in output subsidies to dairy (FSRI Act)		3% (Bouet et al, 2005)
increased land set aside (FSRI Act)	reduction in the productivity of land for wheat	-5% (Bouet et al, 2005; ERS website)
direct payments to cereals and oilseeds in China	subsidy to land use	13% (FAO data and Gtap database)
increase in direct payments to land use in Mexico		7% (Eastwood et al 2004)

Table 3. Percentage change in land prices of Oecd countries

	decoupled payments only		coupled & decoupled payments	
	μ	μ/σ	μ	μ/σ
Japan	-12.8	-0.1	-13.4	-0.1
South Korea	-6.5	-0.1	-5.8	-0.1
USA	-40.1	0.0	-47.8	0.0
Mexico	-16.2	-0.1	-18.8	-0.1
Canada	-54.8	0.0	-53.7	0.0
European Union 15	-73.0	0.0	-74.9	0.0
Ceec	-26.8	-0.1	-25.5	-0.1
Australia	-7.6	-0.1	-4.0	-0.3
New Zealand	0.9	0.2	3.0	0.3

source: own calculations

Table 4. Percentage change in import prices

	decoupled payments only				coupled & decoupled payments			
	GE		PE		GE		PE	
	μ	μ/σ	μ	μ/σ	μ	μ/σ	μ	μ/σ
paddy rice	1.0	8.3	4.6	15.4	11.1	8.5	12.0	5.7
processed rice	0.3	26.0	0.4	7.8	1.4	20.1	1.1	10.1
other cereals	2.6	8.0	11.0	22.4	4.1	12.1	12.9	19.3
oilcrops and products	-0.5	-3.1	4.0	28.6	8.6	23.8	11.3	11.7
vegetable oils	0.1	11.0	0.7	37.0	1.7	34.8	2.0	17.9
vegetables and fruits	-0.1	-0.8	4.3	48.0	0.3	2.9	4.8	43.5
pland based fibers	-0.2	-2.7	2.3	38.5	2.9	12.3	5.2	13.9
other primary products	0.0	-1.0	2.0	99.5	0.7	9.0	2.7	90.3
sugar cane, beet and products	0.3	29.0	0.5	23.0	0.6	29.0	0.5	12.3
livestock products	0.2	6.3	1.8	88.0	0.4	8.6	2.0	65.7
raw milk	0.2	7.7	1.7	14.2	0.7	13.6	1.8	11.5
milk and dairy	0.3	26.0	2.0	196.0	0.5	17.0	2.3	225.0
other food products	0.2	19.0	0.8	83.0	0.5	23.0	1.1	36.0
secondary sectors	0.2				0.2	17.0		
services	0.1				0.2	7.5		

source: own calculations

Table 5. Percentage change in supply. Decoupled payments only scenario. GE closure

	paddy rice		processed rice		other cereals		oilcrops and products		vegetable oils		vegetables and fruits		pland based fibers		other primary products		sugar cane, beet and products		livestock products		raw milk		milk and dairy		other food products		secondary sectors		services		
	μ	μ/σ	μ	μ/σ	μ	μ/σ	μ	μ/σ	μ	μ/σ	μ	μ/σ	μ	μ/σ	μ	μ/σ	μ	μ/σ	μ	μ/σ	μ	μ/σ	μ	μ/σ	μ	μ/σ	μ	μ/σ	μ	μ/σ	
China	0.0	0.0	0.0	2.0	0.5	3.1	-0.4	-2.5	0.1	2.7	0.0	0.0	-0.1	-4.0	-0.1	-2.5	0.1	3.7	0.0	1.0	0.0	2.0	0.4	3.5	0.0		0.0		0.0		
Japan	-0.8	-4.0	-0.2	-1.1	-2.7	-3.9	-4.7	-3.5	0.0	-0.3	0.0	-2.2	-2.0	-6.3	-0.5	-5.0	-0.2	-5.3	-0.5	-4.4	-0.3	-3.1	0.0	0.3	-0.1	-11.0	-0.1	-7.0	0.0		
South Korea	-0.1	-0.9	0.0	-1.0	1.9	3.5	-1.2	-3.4	0.4	3.0	-0.3	-2.4	-0.8	-3.4	-0.4	-4.3	-0.1	-3.0	-1.5	-4.1	-0.5	-6.0	-0.1	-2.0	-0.4	-5.3	0.1	4.5	0.0	3.0	
Taiwan	0.0	-3.0	0.0	-3.0	3.2	3.2	5.0	3.7	-0.8	-5.1	-0.1	-2.6	-0.6	-3.6	-0.2	-3.8	0.2	1.8	-0.1	-2.8	0.1	1.3	0.3	2.5	-0.4	-6.5	0.0	0.0	0.0		
Indonesia	0.0		0.0		1.3	3.8	-0.7	-3.0	-0.1	-4.0	0.0	-3.0	-0.5	-4.3	-0.2	-5.0	0.0	2.0	0.0	1.0	0.2	3.6	0.7	3.5	0.0		0.0	0.0	0.0		
Malaysia	0.1	3.0	0.2	3.2	1.6	3.8	-0.8	-3.4	-0.3	-2.3	-0.1	-4.0	-0.2	-5.0	-0.2	-4.8	0.7	3.8	0.1	2.0	0.0	-2.0	-2.1	-3.7	0.0	2.0	0.0	4.0	0.0		
Philippines	-0.1	-4.0	0.0	-3.0	1.8	3.7	-0.3	-1.9	-0.5	-3.3	-0.1	-1.6	-0.4	-3.2	-0.2	-5.0	-0.1	-5.5	-0.1	-3.0	-0.3	-4.3	-0.7	-3.2	-0.3	-8.3	0.0	1.0	0.0		
Thailand	0.1	4.0	0.1	3.5	2.4	3.9	-0.7	-3.2	0.1	3.7	-0.1	-2.7	-0.5	-4.5	-0.2	-4.4	0.5	3.8	0.0	0.6	0.5	4.2	0.7	3.6	0.0		0.0	-2.0	0.0		
Vietnam	0.1	3.0	0.1	3.0	2.3	3.7	-1.1	-3.2	0.1	3.0	-0.2	-2.7	-0.3	-4.3	-0.2	-4.6	0.1	4.0	0.0	4.0	0.0	1.0	0.5	2.9	0.1	6.5	0.0	-1.0	0.0		
Bangladesh	0.0		0.0		1.0	3.3	-0.1	-1.7	0.0	1.5	0.0	-2.0	-0.3	-5.4	0.0		0.0	4.0	0.0		0.0	1.6	3.5	-0.1	-12.0	-0.1	-9.0	0.0			
India	0.0		0.0		0.2	2.9	-0.1	-2.5	-0.1	-2.3	-0.1	-2.5	-0.1	-4.3	-0.1	-3.5	0.0			0.0		0.0	4.0	0.0		0.0		0.0			
Sri Lanka	0.0	-1.0	0.0	-0.5	3.1	3.4	-0.6	-3.6	0.1	0.8	0.0	-2.0	-0.5	-3.8	-0.1	-4.3	0.1	2.6	-0.1	-4.0	0.0	-1.0	1.2	2.4	0.0	-3.0	0.1	3.5	0.0		
Rest of Asia	0.4	3.6	-0.1	-1.7	0.3	3.1	-0.2	-2.8	-0.1	-3.0	0.0	-4.0	-0.3	-5.0	-0.1	-3.5	0.0	-2.0	0.0	-1.0	0.0		0.1	3.3	0.0		-0.1	-6.0	0.0		
USA	-0.3	-2.4	-0.5	-3.4	-7.6	-4.9	4.7	3.7	0.5	4.1	1.2	3.0	0.7	2.3	1.4	4.0	0.2	3.0	0.2	2.5	0.1	1.1	0.0	2.0	0.0		-0.1	-7.0	0.0		
Mexico	-1.9	-5.1	0.0	-1.5	-2.8	-4.0	-7.6	-4.6	0.1	1.2	0.1	0.4	-0.9	-4.1	0.0	0.2	0.0	0.1	-0.2	-3.8	-0.2	-2.0	-0.1	-1.5	-0.2	-5.7	0.1	6.0	0.1	5.0	
Canada	12.4	4.2	1.5	5.4	2.0	2.8	-6.7	-4.2	-0.6	-4.3	-0.5	-3.0	-3.4	-3.6	-0.4	-4.3	3.5	3.0	-0.1	-0.7	1.0	4.0	0.6	3.6	-0.1	-9.0	0.0	-2.0	0.0		
Colombia	-0.1	-2.5	-0.1	-2.0	3.4	3.7	-0.5	-3.2	-0.4	-3.5	-0.2	-3.0	-0.3	-2.8	-0.6	-4.4	-0.2	-3.6	0.0	-3.0	0.0	-4.0	0.0	-1.0	-0.1	-12.0	0.1	3.0	0.0		
Venezuela	0.1	6.0	0.4	3.0	0.5	3.6	-0.5	-2.5	0.0	1.0	0.0	-2.0	-0.1	-1.3	-0.1	-2.0	0.0	4.0	0.0	2.0	0.0	0.0	0.0		0.0		-0.1		0.1		
Peru	0.0	-4.0	-0.1	-1.8	1.3	3.5	-0.1	-2.8	-0.1	-2.6	-0.2	-2.7	-0.3	-2.8	-0.1	-3.5	0.0	-3.0	0.0	-3.0	0.0	-3.0	0.0	2.0	-0.1		0.0	-2.0	0.0		
Rest of the Andean Pact	-0.1	-7.0	0.0	-0.8	2.7	3.6	-0.5	-3.5	-0.4	-3.3	-0.3	-3.1	-0.4	-3.3	-0.5	-4.6	-0.1	-4.5	0.0	-1.0	0.0		0.0	2.0	-0.1		0.1	2.5	0.0		
Argentina	-0.2	-2.3	0.0	-2.0	1.9	3.9	-1.1	-3.3	-0.1	-0.8	-0.3	-3.2	-0.5	-4.2	-0.4	-4.6	-0.1	-3.3	-0.1	-2.0	-0.1	-2.3	-0.1	-1.7	-0.1	-12.0	-0.2	-20.0	0.0		
Brazil	0.0	0.0	0.0		2.5	3.4	-1.0	-3.2	0.0	-4.0	-0.3	-3.2	-0.3	-4.6	-0.3	-3.9	0.1	1.7	-0.1	-2.5	0.0		0.0		0.0		-0.1	-8.0	0.0		
Chile	0.0	0.0	0.0	1.0	2.1	3.3	-0.6	-2.6	0.0	1.0	-0.4	-2.5	-0.2	-3.4	-0.2	-4.4	0.0	2.0	0.0	-0.7	0.0	-1.0	0.0	1.0	0.0	2.0	0.0	-3.0	0.0		
Uruguay	0.1	3.0	0.2	3.5	0.3	3.0	-0.6	-2.9	0.0	2.0	-0.1	-3.7	-1.0	-3.2	-0.2	-3.8	0.0	0.0	-0.1	-1.3	0.1	5.0	0.1	6.0	0.0		-0.1	-3.5	0.0		
Rest of South America	0.2	3.0	0.0	-0.3	2.4	3.7	-0.4	-2.7	-0.4	-2.9	-0.1	-3.3	-0.4	-3.7	-0.2	-4.0	-0.4	-4.2	0.0	-0.5	0.0	-2.0	0.0	1.5	-0.1	-11.0	0.0	1.5	0.0		
Central America	0.4	3.3	-0.2	-1.8	4.1	3.6	-1.2	-3.2	-0.6	-3.5	-0.6	-3.1	-0.3	-2.5	-0.5	-5.0	-0.2	-3.2	-0.1	-2.0	0.0	-2.0	0.0	1.0	-0.2	-15.0	0.1	4.3	0.0		
Rest of FTAAs	0.0	-0.6	-0.5	-3.4	3.6	3.6	-0.6	-2.8	-0.1	-2.8	-0.3	-2.5	-0.3	-2.8	-0.4	-3.6	-0.3	-2.9	-0.1	-1.4	-0.1	-3.0	0.0	-2.0	-0.1	-10.0	0.0	-3.0	0.0		
Rest of the Caribbean	0.0	-2.0	-0.2	-3.0	0.6	3.2	0.0	-1.3	-0.1	-2.3	-0.1	-3.0	0.0	-2.0	-0.1	-3.3	0.0	2.0	0.0	-1.0	0.0	-1.0	0.0	-1.0	-0.1		-0.1	-7.0	0.0		
European Union 15	0.2	2.1	0.1	0.9	1.7	3.6	-0.4	-2.2	-0.1	-4.0	-0.2	-2.3	-0.2	-1.3	-0.1	-3.0	-0.1	-1.7	0.0	-0.6	-0.1	-1.8	-0.1	-1.0	-0.1		0.4	35.0	-0.1		
Ceec	-1.9	-5.3	-0.3	-8.0	-6.6	-5.8	-10.4	-5.0	-0.6	-6.2	0.9	1.8	-2.9	-4.5	0.0	-0.1	-0.3	-4.9	-1.5	-4.3	-0.5	-2.5	-0.3	-1.6	-0.5	-15.0	0.6	8.7	0.0	-1.0	
Turkey	0.3	3.1	0.5	2.7	1.1	3.4	-0.2	-2.3	-0.2	-3.3	-0.1	-3.3	-0.1	-2.0	-0.2	-4.0	0.0		0.1	2.0	0.0	1.0	0.0	1.0	-0.1	-5.0	-0.1	-5.0	0.0		
Russian Federation	0.0	0.5	0.0	3.0	0.5	3.5	-0.4	-2.6	-0.1	-2.0	0.0	-1.5	-0.3	-3.3	-0.1	-3.5	0.0	1.0	0.0	-0.7	0.0	1.0	0.0	1.0	0.0	2.0	-0.1		0.0		
Rest of the Middle east	0.0	1.0	0.1	3.3	2.2	3.1	-0.3	-2.8	-0.2	-2.7	0.0	-2.0	-0.3	-3.1	-0.1	-3.3	-0.1	-3.0	-0.1	-3.0	0.0	4.0	0.2	3.5	-0.1	-11.0		0.0			
Morocco	-0.1	-3.5	-0.1	-3.3	0.9	3.4	-0.6	-2.7	-0.4	-2.4	-0.2	-2.9	-0.1	-2.3	-0.2	-3.6	-0.1	-3.0	0.0	-2.0	0.0	-3.0	-0.2	-2.5	-0.2	-8.5	-0.1	-6.5	0.0	0.0	
Tunisia	1.0	4.0	1.1	3.6	2.1	3.3	-1.1	-2.9	-1.1	-2.9	0.2	4.0	-0.5	-2.6	-0.1	-3.0	0.1	2.5	0.0	3.0	0.1	2.0	0.1	3.0	0.0	-2.0	-0.1	-7.0	0.0		
Rest of North Africa	-0.2	-1.3	-1.9	-3.3	1.2	3.5	-0.4	-2.3	-0.3	-2.3	0.1	2.5	-0.4	-2.7	-0.1	-2.7	-0.1	-5.0	0.0	-0.5	0.0	-1.0	-0.2	-2.7	-0.1	-4.5	-0.2	-5.3	0.0	0.0	
S. African Cust Union	0.0	0.3	0.0	2.0	2.8	3.4	-0.5	-2.1	-0.1	-1.8	-0.4	-2.7	-0.7	-3.2	-0.2	-3.2	0.2	3.7	0.0	-1.0	0.0	3.0	0.1	3.0	0.0	-2.0	-0.1	-8.0	0.0		
Tanzania	0.1	3.0	0.1	3.7	0.3	2.5	-0.2	-2.3	0.0	-1.0	-0.1	-2.7	-0.6	-3.6	-0.1	-2.8	0.0		0.0	-1.0	0.0	0.0	4	3.5	0.0		0.0	-1.0	0.0		
Mozambique	0.1	2.0	0.0	0.5	0.4	3.1	-0.6	-2.4	-0.1	-1.8	-0.1	-1.8	-0.1	-5.0	-0.4	-3.2	-0.1	-2.7	-0.2	-0.9	0.0	-2.0	0.1	2.0	0.6	3.2	-0.1	-13.0	-0.1	-3.0	0.0
Other Southern Africa	0.0	2.0	0.1	2.3	0.3	2.9	0.0	-3.0	0.0	-2.0	-0.1	-4.5	-0.4	-4.2	-0.2	-3.3	-0.1	-6.0	0.0	2.0	0.2	3.8	0.5	3.4	0.0		0.0	-1.0	0.0		
Madagascar	0.0	1.0	0.0	1.0	0.2	1.8	-0.1	-3.0	-0.1	-2.8	-0.1	-3.5	-0.1	-4.3	0.0	-1.0	0.0		0.0		0.0	0.1	2.0	0.0		0.0	0.0	0.0	0.0		
Uganda	0.0	-4.0	-0.3	-3.1	0.5	3.0	-0.1	-2.3	-0.4	-3.5	0.0		-0.7	-4.1	-0.3	-5.0	0.0		0.0	-1.0	0.0	-1.0	0.0	-1.5	-0.1		-0.1	-4.0	0.0		
Malawi	0.1	2.3	0.2	2.4	0.2	2.4	0.1	2.5	0.2	2.7	0.1	2.5	-0.1	-4.5	-0.3	-4.1	0.4	2.3	0.0	0.0	0.1	2.5	0.1	1.1	0.0	0.0	0.2	4.2	0.0	-1.0	
Rest of S- Saharan Africa	0.0	3.0	0.0	3.0	1.0	3.4	-0.6	-2.9	-0.2	-4.3	-0.1	-3.7	-0.7	-3.6	-0.2	-3.2	0.0		0.0	-2.0	0.0	-1.0	-0.1	-5.0	-0.1		0.0	0.0	0.0		
Australia	0.6	4.6	0.2	3.2	4.5	4.1	-0.1	-0.5	-0.2	-2.9	0.8	3.6	2.6	5.2	0.5	5.1	-2.4	-3.9	0.0	0.4	-7.8	-6.6	-5.4	-4.0	0.0	-1.0	-0.1	-2.0	0.0		
New Zealand	0.1	2.3	0.0	-1.0	1.1	3.1	-1.2	-2.7	0.0		-0.3	-2.0	-0.1	-2.7	-0.3	-4.3	0.2	3.0	-0.2	-1.2	0.8	4.2	0.9	4.2	0.1	2.5	-0.1	-3.0	0.0		
Rest of the world	0.0	0.0	0.0	1.0	0.5	3.5	-0.2	-1.8	-0.1	-3.5	-0.1	-2.7	-0.3	-3.0	-0.1	-2.2	0.0	0.0	0.0	1.5	0.0	4.0	0.1	3.3	0.0		0.0		0.0		

source: own calculations

Table 6. Percentage change in supply. Decoupled payments only scenario. PE closure

	paddy rice		processed rice		other cereals		oilcrops and products		vegetable oils		vegetables and fruits		pland based fibers		other primary products		sugar cane, beet and products		livestock products		raw milk		milk and dairy		other food products	
	μ	μ/σ	μ	μ/σ	μ	μ/σ	μ	μ/σ	μ	μ/σ	μ	μ/σ	μ	μ/σ	μ	μ/σ	μ	μ/σ	μ	μ/σ	μ	μ/σ	μ	μ/σ	μ	μ/σ
China	0.3	3.4	0.1	2.5	2.3	3.5	2.1	3.6	0.0	-0.8	0.3	2.9	0.4	3.6	0.6	3.0	0.3	3.4	0.4	3.0	0.2	3.0	1.3	3.5	0.2	2.4
Japan	-1.1	-3.1	-0.4	-1.0	5.0	5.6	-3.0	-2.4	-1.2	-6.1	-0.5	-0.8	-2.1	-7.4	-0.1	-1.0	-0.3	-5.8	-0.1	-0.4	-1.1	-7.9	-0.1	-0.9	-0.3	-30.0
South Korea	-0.7	-1.7	-0.5	-1.1	2.2	4.3	-0.4	-0.9	-1.9	-4.6	-0.8	-1.3	-2.2	-5.1	-0.5	-2.7	-0.3	-10.7	-1.8	-4.2	-1.3	-6.9	-0.2	-1.7	-1.0	-7.1
Taiwan	0.0	0.0	0.0	-1.3	9.4	3.8	-1.0	-2.8	-3.0	-5.5	0.9	2.8	3.7	5.0	1.3	2.9	0.2	1.7	0.2	0.9	0.2	0.8	0.6	2.2	-0.9	-12.1
Indonesia	0.2	1.3	0.1	0.7	4.7	5.9	2.4	4.0	1.2	4.0	0.5	2.9	2.2	5.8	1.9	4.2	0.2	2.5	0.6	2.9	0.8	3.5	2.5	3.3	0.1	2.0
Malaysia	2.2	3.3	-0.7	-2.7	7.2	5.3	4.3	3.9	2.7	3.4	3.1	3.7	3.6	4.0	2.7	4.2	2.0	3.3	3.5	3.6	0.4	3.5	0.2	0.8	0.8	3.3
Philippines	0.1	1.0	0.1	0.9	5.8	5.5	5.0	4.5	2.8	3.4	1.2	3.2	1.9	4.0	0.7	2.4	-0.1	-1.2	0.0	0.5	-0.5	-4.6	-0.7	-3.8	-0.5	-10.2
Thailand	2.0	3.2	1.5	3.2	9.6	5.3	3.2	3.6	0.4	2.7	1.8	3.1	2.8	3.7	3.2	3.6	1.5	3.2	3.1	3.3	1.7	3.6	1.8	3.2	0.8	3.3
Vietnam	0.6	2.9	0.5	2.6	8.3	4.9	4.8	5.7	0.5	3.8	2.3	3.7	2.6	4.2	3.5	4.4	0.6	2.9	0.7	2.9	0.5	2.2	1.3	2.9	1.0	3.3
Bangladesh	0.0	2.0	0.0	-0.5	4.5	4.8	1.3	3.5	-1.3	-4.4	0.6	3.1	1.1	4.5	0.0	1.3	0.0	2.0	0.1	2.0	0.1	2.6	2.1	3.5	-0.1	-1.7
India	0.6	3.1	0.1	3.0	1.1	3.3	0.4	3.3	0.4	2.8	0.6	3.3	0.6	3.9	0.6	3.0	0.1	1.8	0.4	3.3	0.1	1.6	0.1	2.6	0.3	3.2
Sri Lanka	0.1	0.4	0.0	0.0	9.6	6.5	4.1	7.3	0.6	2.3	0.3	2.0	4.6	6.2	3.0	4.4	0.5	2.7	-0.1	-2.0	-0.1	-1.8	1.3	1.7	0.3	2.0
Rest of Asia	1.3	3.9	0.0	-0.3	1.0	3.6	0.9	3.6	0.1	1.5	0.3	3.3	1.0	4.0	0.5	2.8	0.2	2.9	0.3	2.9	0.1	2.2	0.5	2.9	0.2	2.7
USA	-10.7	-4.6	-1.7	-3.5	-16.0	-6.9	-5.4	-4.3	-1.0	-5.4	-4.8	-3.0	-6.8	-4.9	-4.0	-4.0	-0.3	-5.0	-0.8	-4.4	-3.4	-14.3	-0.8	-4.8	-0.3	-26.0
Mexico	2.5	8.2	-0.7	-4.1	-1.0	-0.9	-8.0	-7.8	-2.0	-5.3	0.4	0.5	0.8	1.2	-0.3	-1.3	-0.7	-5.9	-0.3	-1.5	-2.0	-7.2	-0.5	-3.7	-0.8	-13.2
Canada	-4.6	-4.1	-6.0	-66.3	-8.6	-4.0	-17.1	-5.6	-3.2	-4.9	-8.5	-4.2	-5.2	-4.9	1.1	4.0	-2.1	-2.9	-8.0	-4.1	-4.7	-7.5	-2.2	-4.1	-1.5	-4.5
Colombia	0.7	3.9	-0.4	-1.5	12.2	4.6	1.7	3.2	-0.3	-2.6	3.5	3.2	3.1	3.5	5.0	4.7	-0.3	-4.8	0.4	2.2	0.5	2.6	0.3	2.2	0.0	-0.8
Venezuela	0.7	5.3	1.5	3.2	1.6	3.9	3.7	3.7	0.0	0.3	0.6	3.2	2.3	4.2	0.8	3.5	0.2	3.1	0.4	3.0	0.3	3.3	0.1	2.6	0.1	3.0
Peru	0.5	3.1	-0.4	-1.7	5.2	3.8	0.8	2.9	0.4	2.7	2.4	3.1	2.4	3.8	1.3	3.0	0.2	2.7	0.5	2.9	0.3	2.7	0.2	2.7	0.2	2.1
Rest of the Andean Pact	1.3	3.7	0.1	0.3	11.7	4.1	3.6	3.1	0.0	0.4	7.6	3.6	5.9	3.7	4.9	4.2	0.4	2.2	0.6	2.4	0.8	2.9	0.4	2.5	0.6	2.6
Argentina	3.9	3.1	1.7	2.8	15.0	4.1	7.6	3.4	2.1	3.7	6.1	3.0	3.4	2.9	3.9	3.2	1.1	2.7	1.7	2.8	1.5	3.0	1.1	2.8	0.7	3.4
Brazil	0.8	3.5	0.1	2.3	15.0	3.7	9.8	3.8	0.6	4.3	5.8	3.2	2.9	3.1	4.0	3.3	0.8	3.1	2.6	3.2	1.1	3.5	0.1	2.8	0.6	3.4
Chile	0.9	2.8	0.3	2.1	12.2	3.2	7.9	3.3	0.7	3.7	6.5	3.1	1.5	2.7	3.2	3.4	0.7	3.3	1.5	2.7	1.5	3.0	0.5	2.7	0.6	3.6
Uruguay	0.9	6.0	1.1	3.3	1.8	2.7	4.0	3.5	0.5	3.5	4.3	3.2	6.5	4.0	2.5	3.1	0.3	2.9	3.8	3.4	2.3	3.2	2.5	3.2	0.5	3.0
Rest of South America	14.1	4.5	1.0	3.5	17.6	4.4	8.4	3.7	0.1	3.5	3.6	2.9	6.5	3.5	3.9	2.9	1.4	3.0	2.3	2.7	2.0	2.9	1.5	2.9	0.8	3.1
Central America	9.0	4.1	-0.6	-1.3	14.2	4.0	9.5	3.4	1.3	2.6	9.1	3.3	5.2	3.0	7.5	3.2	0.1	0.5	1.4	2.5	1.5	2.8	0.9	2.3	0.2	1.2
Rest of FTAA	3.6	3.3	-2.0	-3.8	12.6	4.0	3.4	3.2	0.6	2.9	4.3	3.1	2.8	3.1	2.9	3.2	0.8	2.6	0.9	2.7	1.2	3.0	1.0	2.6	0.1	1.3
Rest of the Caribbean	1.2	3.9	-1.3	-3.5	11.4	4.4	1.2	2.9	0.3	1.9	1.6	3.0	0.8	3.0	2.5	3.4	-1.2	-3.7	1.1	2.9	1.0	2.9	1.7	2.9	0.3	2.3
European Union 15	-20.8	-5.1	-3.3	-4.2	-16.2	-5.5	-19.0	-5.4	-1.0	-5.5	-7.2	-3.4	-14.0	-4.2	-4.4	-4.0	-1.2	-4.4	-2.1	-4.3	-5.9	-10.5	-1.9	-4.2	-0.8	-7.4
Ceec	6.7	7.1	-0.3	-4.7	-7.4	-6.4	-13.6	-5.8	-0.6	-3.9	-1.3	-1.8	-4.0	-3.8	-1.0	-3.8	-0.8	-5.2	-2.7	-4.5	-1.8	-4.3	0.7	1.5	-1.0	-7.6
Turkey	3.6	4.9	2.0	3.1	7.0	3.5	2.6	3.2	1.3	3.2	2.5	3.1	0.9	2.9	3.0	3.3	0.1	1.8	1.6	3.2	0.6	2.5	0.6	2.8	0.2	1.9
Russian Federation	5.4	6.3	-0.1	-2.5	5.0	3.3	4.6	4.0	0.9	4.4	0.9	2.9	2.0	3.4	1.9	4.6	0.2	2.1	1.1	3.0	0.3	2.4	1.0	3.1	0.5	3.0
Rest of the Middle east	0.2	2.3	-0.3	-5.8	9.3	3.6	1.8	3.3	0.1	0.7	0.7	3.0	2.6	3.7	0.9	3.6	-0.5	-3.9	0.2	1.1	0.5	2.5	2.7	3.0	-0.2	-5.0
Morocco	35.1	4.7	-0.8	-6.0	7.3	3.8	2.2	3.0	-1.1	-12.4	5.3	3.1	0.5	2.2	2.5	3.1	-0.4	-8.2	0.7	2.1	1.0	2.7	1.5	2.1	-0.1	-0.9
Tunisia	11.5	4.2	4.6	4.0	12.3	3.5	8.0	3.8	7.3	3.7	3.0	3.3	3.0	3.0	2.1	3.7	0.4	1.9	1.1	2.5	1.2	2.4	1.0	2.2	0.5	2.3
Rest of North Africa	15.9	12.5	-5.7	-4.5	4.9	3.9	1.6	3.0	0.0	0.1	0.9	3.0	1.6	3.3	0.5	2.8	-0.2	-4.0	0.2	1.8	0.6	2.9	1.1	2.2	-0.1	-3.5
S. African Cust Union	5.1	5.5	0.0	0.0	11.0	3.2	7.5	3.4	0.3	3.0	10.1	3.3	3.9	3.1	2.5	3.5	1.0	3.2	1.3	2.9	0.8	3.2	0.7	3.2	0.5	3.2
Tanzania	0.7	3.2	0.5	2.8	1.9	2.9	2.3	3.3	0.4	2.8	1.1	3.2	3.9	4.0	2.0	3.1	0.2	2.8	0.4	2.7	0.9	3.0	4.0	3.2	0.2	2.8
Mozambique	0.6	4.0	0.6	3.4	1.6	3.4	9.8	4.2	0.3	4.5	0.5	2.9	4.4	5.3	1.1	2.9	1.9	3.2	0.2	2.4	0.7	3.2	1.7	3.4	0.5	2.8
Other Southern Africa	1.1	4.4	0.3	4.1	1.8	3.1	0.8	3.0	0.5	3.2	3.5	3.1	2.5	3.6	3.6	3.6	2.3	3.2	1.0	3.0	0.9	3.3	1.8	3.2	0.4	3.2
Madagascar	0.1	2.3	0.1	1.8	8.2	4.2	0.9	3.5	0.8	3.2	3.9	3.2	2.8	4.6	1.2	3.1	0.2	2.7	0.2	2.9	0.1	2.4	1.2	3.3	0.5	3.1
Uganda	0.3	4.7	-1.7	-3.4	2.6	3.5	1.7	3.3	1.4	4.6	0.2	2.6	4.3	5.1	5.7	3.7	0.4	3.1	0.8	3.1	0.2	1.9	1.1	2.9	0.6	3.1
Malawi	0.9	2.5	0.5	2.6	1.7	2.5	1.8	2.7	1.0	2.1	2.2	2.8	5.5	3.3	9.9	3.5	2.2	3.1	0.5	2.8	1.4	3.1	0.6	3.0	0.2	2.7
Rest of S- Saharan Africa	0.8	3.6	0.2	1.3	4.9	3.9	5.4	3.6	0.9	3.5	4.3	3.2	5.0	4.1	2.7	3.4	0.1	1.6	0.4	2.1	0.2	1.1	3.0	2.7	0.2	1.8
Australia	6.1	4.0	0.4	4.3	15.1	5.0	9.7	4.6	0.6	3.4	1.9	3.2	7.3	4.2	2.7	3.5	-2.2	-4.2	3.5	3.3	-6.7	-11.1	-3.9	-4.8	0.4	2.9
New Zealand	8.6	4.1	0.9	3.5	10.9	3.1	11.9	3.3	0.6	3.1	9.2	3.2	0.6	2.6	4.4	3.4	0.8	3.0	8.6	3.2	7.7	3.2	7.9	3.2	1.4	3.3
Rest of the world	1.0	4.4	0.4	3.1	3.6	3.3	3.4	3.5	1.0	3.2	1.3	3.2	2.7	3.7	2.2	3.3	0.5	3.3	1.4	3.2	1.0	3.2	1.9	3.0	0.6	3.0

source: own calculations

Table 7. Percentage change in supply. Coupled and decoupled payments scenario. GE closure

	paddy rice		processed rice		other cereals		oilcrops and products		vegetable oils		vegetables and fruits		pland based fibers		other primary products		sugar cane, beet and products		livestock products		raw milk		milk and dairy		other food products		secondary sectors		services	
	μ	μ/σ	μ	μ/σ	μ	μ/σ	μ	μ/σ	μ	μ/σ	μ	μ/σ	μ	μ/σ	μ	μ/σ	μ	μ/σ	μ	μ/σ	μ	μ/σ	μ	μ/σ	μ	μ/σ	μ	μ/σ	μ	μ/σ
China	0.3	2.9	0.1	1.1	0.9	3.5	3.8	3.4	-0.5	-3.4	0.0	-4.0	0.6	5.2	0.0	-1.5	0.1	3.3	-0.1	-2.8	0.0	0.8	3.6	-0.1	-10.0	-0.1	-3.5	0.0	0.0	
Japan	-1.8	-2.3	-0.7	-0.9	0.3	0.8	-22.1	-3.4	-1.3	-5.7	-0.4	-1.6	-1.6	-7.1	1.6	5.2	-0.1	-3.5	-1.4	-5.1	-1.9	-5.0	-0.2	-3.1	-0.1	-5.0	-0.1	-13.0	0.1	
South Korea	0.0	-0.6	-0.1	-1.3	2.6	4.1	6.6	4.8	-3.3	-5.1	-0.3	-1.9	0.1	0.4	-0.3	-3.4	-0.2	-5.0	-1.8	-4.2	-0.6	-4.4	0.0	0.1	-0.6	-4.8	0.1	6.0	0.0	2.0
Taiwan	0.0	0.7	0.0	0.3	4.6	3.6	-12.9	-6.5	-2.8	-5.4	0.0	0.3	2.2	5.8	-0.2	-5.5	0.3	2.3	-0.3	-3.4	0.2	0.7	0.5	2.2	-0.6	-7.1	0.0	3.0	0.0	0.0
Indonesia	0.0	-0.7	0.0	0.0	1.8	4.7	4.4	4.2	2.1	3.6	-0.1	-2.5	0.4	2.8	0.0	-0.3	0.0	0.0	-0.1	-1.5	0.3	3.1	1.1	3.2	-0.1	-2.7	-0.2	-3.8	0.0	-2.0
Malaysia	4.8	3.9	-0.4	-1.3	1.7	5.2	6.3	5.4	6.3	3.2	-0.5	-2.6	1.4	7.9	0.0	-0.1	0.2	2.1	-0.4	-2.1	-0.1	-5.5	-3.1	-4.0	-0.2	-2.2	-0.2	-3.2	-0.1	-7.0
Philippines	0.0	-0.7	0.1	1.6	2.5	4.4	6.4	4.2	5.1	3.3	-0.1	-0.6	0.8	5.5	-0.1	-3.0	-0.2	-3.8	-0.1	-3.7	-0.5	-4.1	-1.0	-4.1	-0.4	-5.4	-0.3	-4.3	-0.1	-2.5
Thailand	0.9	4.3	0.2	0.9	3.5	4.8	4.9	5.0	-0.1	-1.1	-0.1	-1.8	0.7	5.3	-0.2	-2.4	0.7	4.1	0.0	-0.2	0.7	3.8	1.0	3.5	0.0	1.5	-0.1	-5.5	0.0	0.0
Vietnam	0.5	3.4	0.3	3.2	3.3	4.2	9.0	5.5	0.4	3.3	-0.1	-1.0	2.9	6.3	0.2	1.8	0.0	2.0	-0.1	-0.8	0.1	1.6	0.9	3.0	0.1	2.8	-0.3	-6.3	0.0	0.0
Bangladesh	0.0	-1.0	0.0	-1.0	1.9	3.9	3.5	3.2	-0.5	-1.7	0.0	0.0	0.9	5.2	0.0	-1.3	0.1	2.3	0.0	-0.7	0.0	0.5	1.5	3.5	-0.1	-6.5	-0.2	-3.5	0.0	1.0
India	1.8	2.7	0.1	1.7	0.3	3.3	0.6	3.1	0.7	3.9	-0.1	-1.2	0.2	4.3	-0.1	-1.0	0.0	-1.0	0.1	2.7	-0.1	-2.3	0.0	-0.5	0.0	-0.7	-0.3	-4.5	0.0	-0.5
Sri Lanka	0.4	2.1	0.1	1.7	4.3	4.0	7.5	6.7	1.0	2.8	-0.1	-3.0	6.0	7.4	0.2	2.3	0.2	4.2	-0.2	-5.7	-0.1	-3.3	0.7	2.2	0.0	0.8	-0.1	-2.8	0.0	-2.0
Rest of Asia	2.2	3.8	-0.2	-1.3	0.3	3.1	1.3	3.7	-0.3	-2.1	-0.1	-2.4	0.3	3.6	-0.1	-2.0	-0.1	-2.0	-0.1	-2.0	-0.2	-3.2	0.0	-0.4	-0.1	-1.8	-0.2	-4.8	0.0	0.0
USA	-50.9	-4.4	-1.4	-3.4	-10.3	-6.3	-17.3	-5.9	-2.5	-7.2	-0.8	-1.8	-0.7	-1.4	0.6	1.4	0.0	0.3	0.4	1.8	-3.0	-6.3	-2.6	-6.1	-0.2	-10.0	0.0	0.7	0.0	4.0
Mexico	0.7	0.1	-0.3	-1.7	-7.5	-4.6	-33.6	-6.9	-3.1	-4.7	1.3	3.3	1.1	3.7	0.2	2.6	-0.1	-1.1	-0.1	-4.0	-0.1	-0.2	0.7	2.8	-0.5	-10.4	0.1	5.5	0.1	7.0
Canada	35.4	5.2	-4.1	-4.3	-0.8	-1.7	4.9	2.7	-0.7	-3.0	-0.8	-2.8	-1.7	-2.2	1.1	3.9	3.7	3.1	-2.5	-4.0	0.3	1.3	0.6	2.9	-0.3	-5.7	-0.1	-5.0	0.0	0.0
Colombia	0.5	15.3	-0.2	-1.4	4.9	4.2	2.7	4.2	1.2	2.7	-0.2	-1.5	0.8	3.8	0.0	-0.2	-0.3	-4.0	-0.1	-3.5	-0.1	-5.5	0.1	1.8	-0.2	-9.5	-0.1	-2.8	0.0	-2.0
Venezuela	1.6	12.5	1.6	2.9	0.8	4.1	7.1	3.6	0.2	3.0	0.0	0.0	2.3	5.5	0.2	3.0	0.1	4.5	0.0	0.5	0.1	3.5	0.0	1.0	0.1	5.0	-0.1	-13.0	0.0	0.0
Peru	0.1	2.6	-0.2	-1.4	2.1	3.9	1.2	2.8	1.1	2.9	0.0	-0.2	0.8	3.8	0.1	1.2	0.0	1.0	0.0	1.0	0.0	0.5	0.2	2.5	-0.1	-5.0	-0.1	-5.0	0.0	0.0
Rest of the Andean Pact	0.5	7.1	0.0	0.0	4.0	4.2	4.6	4.3	1.9	2.9	-0.3	-1.6	2.0	5.6	0.0	0.1	-0.2	-3.6	0.0	-1.5	-0.1	-4.5	0.1	3.0	-0.3	-3.8	-0.2	-3.8	0.0	-1.0
Argentina	3.1	5.4	-0.8	-2.7	1.6	4.4	5.8	5.0	-4.2	-2.4	-0.9	-3.0	0.5	1.9	-0.6	-3.4	-0.4	-4.7	-0.5	-3.5	-0.5	-3.4	-0.1	-1.1	-0.3	-10.0	-0.7	-12.3	0.1	9.0
Brazil	0.3	2.4	0.0	0.0	2.3	4.0	14.6	3.9	-0.4	-1.4	-0.7	-2.0	1.2	4.0	-0.5	-2.0	-0.5	-6.4	-0.6	-2.9	0.2	1.8	0.0	0.0	-0.1	-2.7	-0.7	-8.0	0.1	2.5
Chile	0.6	2.9	0.4	2.6	3.2	3.6	10.0	4.1	0.1	0.5	-0.1	-0.2	0.5	2.3	0.1	1.3	0.1	10.0	0.0	0.0	0.1	1.8	0.3	3.3	0.1	3.0	-0.2	-3.6	0.0	0.0
Uruguay	3.2	3.8	1.5	3.6	0.6	3.3	3.7	3.6	0.1	0.7	-0.3	-3.1	5.1	4.8	0.2	2.8	0.1	4.5	-0.1	-0.7	0.6	4.1	0.8	4.4	0.1	5.0	-0.4	-5.3	0.0	1.0
Rest of South America	22.1	6.2	1.0	3.4	0.3	0.8	5.8	4.7	0.6	1.5	-0.9	-2.4	-0.8	-1.0	-0.9	-3.7	-2.5	-4.4	-1.0	-2.5	-1.0	-2.9	-0.1	-0.7	-0.9	-3.5	-1.4	-5.8	-0.2	-2.1
Central America	21.6	12.0	-1.1	-1.6	5.3	4.0	11.9	4.4	2.4	3.3	-0.7	-1.9	0.4	1.6	-0.4	-2.2	-1.3	-4.0	-0.3	-2.7	-0.3	-3.1	0.4	2.3	-0.6	-6.2	-0.2	-2.3	-0.1	-2.5
Rest of FTAA	13.4	4.1	-1.9	-2.6	5.0	4.2	4.5	3.9	0.6	3.0	-0.4	-1.6	0.8	3.8	-0.3	-1.9	-0.6	-2.9	-0.2	-1.9	-0.2	-2.2	0.1	2.0	-0.2	-4.3	-0.2	-4.0	0.0	-1.0
Rest of the Caribbean	2.7	4.0	0.4	2.5	0.9	3.8	2.1	3.2	0.5	2.5	-0.1	-1.7	0.9	4.7	0.3	2.5	0.2	2.5	0.0	-0.4	0.0	-0.8	0.1	1.7	-0.1	-3.3	-0.2	-11.5	0.0	1.0
European Union 15	-39.4	-4.7	-5.7	-4.0	3.0	3.6	-31.9	-5.4	-1.4	-4.7	0.3	2.5	-55.1	-5.5	-1.6	-4.7	0.0	0.4	0.0	-0.2	-0.1	-0.6	0.1	0.8	-0.2	-5.7	0.5	50.0	-0.1	-10.0
Ceec	22.5	6.4	0.8	2.7	-7.7	-5.6	3.0	2.7	0.5	2.2	1.4	2.5	6.4	5.7	1.6	5.1	-0.1	-1.3	-0.8	-2.7	-0.9	-3.8	-0.1	-0.7	-0.5	-11.3	0.5	10.2	0.0	-3.0
Turkey	7.4	6.2	0.5	1.1	1.5	3.9	4.2	3.1	2.6	3.1	-0.1	-2.2	1.2	3.7	0.1	1.6	-0.1	-5.0	-0.2	-3.4	-0.1	-2.0	0.0	-0.5	-0.3	-8.7	-0.2	-5.0	0.0	-1.0
Russian Federation	8.7	7.4	-0.1	-0.7	0.7	3.8	7.3	3.9	1.1	4.3	-0.1	-1.3	1.1	5.0	0.3	2.8	0.1	1.4	0.0	0.0	0.0	1.0	0.1	2.8	0.1	3.0	-0.1	-13.0	0.0	3.0
Rest of the Middle east	1.6	2.5	0.5	2.4	3.7	3.4	4.1	3.3	1.1	2.7	0.0	0.0	4.6	4.4	0.2	2.8	-0.2	-3.2	-0.1	-2.6	0.0	1.0	0.3	2.5	-0.2	-5.7	-0.1	-12.0	0.0	1.0
Morocco	73.0	4.3	0.1	1.0	1.4	3.7	4.5	3.7	2.7	2.5	-0.2	-2.4	0.9	4.4	0.4	3.6	-0.1	-4.0	-0.1	-2.0	0.1	2.0	-0.3	-4.2	-0.2	-5.0	-0.3	-5.5	0.0	-1.5
Tunisia	24.3	3.5	2.3	2.9	2.8	3.5	12.0	3.7	11.2	3.6	0.5	4.0	-3.1	-9.1	0.3	3.4	0.2	3.0	0.1	1.8	0.1	2.0	0.2	2.9	0.1	2.3	-0.4	-7.8	0.0	-0.5
Rest of North Africa	26.5	8.0	0.0	-0.1	1.7	3.9	3.0	3.1	1.1	2.4	0.1	2.5	2.8	4.7	0.1	2.3	-0.1	-3.7	0.0	-0.5	0.1	2.3	-0.2	-4.4	-0.1	-5.5	-0.3	-6.0	0.0	-1.0
S. African Cust Union	7.9	8.8	1.5	2.7	4.3	3.6	11.6	3.5	1.2	2.9	-0.4	-1.8	2.1	4.2	0.4	3.2	0.4	3.9	0.0	1.0	0.1	2.7	0.1	2.6	0.1	3.0	-0.2	-6.7	0.0	3.0
Tanzania	1.3	3.3	0.1	1.0	0.4	3.0	3.4	3.4	0.0	-1.3	-0.1	-3.3	4.6	5.0	0.0	0.8	0.0	-1.0	0.0	-1.0	-0.1	-1.3	0.2	1.6	-0.1	-1.7	-0.7	-4.6	-0.2	-3.0
Mozambique	1.6	3.9	0.6	3.0	0.6	3.5	17.5	3.8	1.7	3.7	-0.1	-2.0	9.6	6.3	0.1	1.2	-0.3	-1.0	-0.1	-2.3	0.1	2.4	1.1	3.7	-0.3	-4.2	-0.7	-6.3	0.0	-1.5
Other Southern Africa	3.2	3.2	0.9	2.7	0.4	3.2	1.2	2.8	0.9	3.3	-0.2	-2.1	2.8	4.5	0.6	3.4	0.1	0.5	0.1	3.7	0.2	3.3	0.5	3.2	0.0	2.0	-0.3	-5.4	0.0	2.0
Madagascar	0.1	3.3	0.1	3.5	0.0	0.4	1.7	2.8	2.6	2.9	-0.2	-5.0	7.1	5.4	0.2	4.3	0.0	1.0	0.0											

Table 8. Percentage change in supply. Coupled and decoupled payments scenario. PE closure

	paddy rice		processed rice		other cereals		oilcrops and products		vegetable oils		vegetables and fruits		pland based fibers		other primary products		sugar cane, beet and products		livestock products		raw milk		milk and dairy		other food products	
	μ	μ/σ	μ	μ/σ	μ	μ/σ	μ	μ/σ	μ	μ/σ	μ	μ/σ	μ	μ/σ	μ	μ/σ	μ	μ/σ	μ	μ/σ	μ	μ/σ	μ	μ/σ	μ	μ/σ
China	0.7	3.5	0.1	1.6	2.7	3.5	5.7	4.0	-0.4	-3.7	0.3	2.7	1.0	4.9	0.6	3.0	0.3	3.1	0.4	2.6	0.2	3.0	1.7	3.6	0.1	1.6
Japan	-2.6	-2.8	-0.9	-0.9	9.0	6.2	-21.1	-3.2	-2.3	-6.1	-0.3	-0.5	-1.8	-5.9	2.5	4.5	-0.3	-6.0	-0.8	-4.6	-2.7	-10.6	-0.3	-2.1	-0.3	-8.7
South Korea	-0.7	-1.7	-0.5	-1.2	2.8	5.1	6.5	5.0	-5.1	-5.9	-0.6	-1.1	-1.1	-2.5	-0.3	-2.1	-0.4	-18.5	-1.8	-4.6	-1.3	-5.7	-0.1	-0.5	-1.1	-10.4
Taiwan	0.0	0.8	-0.1	-1.3	12.4	3.7	-16.9	-10.6	-5.3	-5.8	1.2	2.9	6.6	5.7	1.1	2.6	0.0	-0.1	0.0	0.1	0.1	0.2	0.6	1.9	-1.3	-10.8
Indonesia	0.3	1.4	0.2	0.8	5.8	6.1	7.3	5.1	2.9	4.4	0.6	2.9	3.8	6.6	2.5	4.2	0.2	1.8	0.7	2.7	1.0	3.6	3.0	3.4	0.1	1.7
Malaysia	8.7	4.2	-1.3	-2.2	9.4	5.1	12.6	5.4	8.0	3.7	4.3	3.6	7.0	4.8	3.5	4.2	2.5	3.0	4.4	3.4	0.5	3.3	-0.3	-2.2	0.8	3.4
Philippines	0.3	1.7	0.3	1.6	7.3	5.8	12.0	5.0	8.9	3.5	1.5	3.3	3.5	4.6	1.0	2.4	-0.1	-1.0	0.0	0.3	-0.6	-4.9	-0.9	-5.0	-0.6	-15.5
Thailand	3.6	3.6	2.1	4.0	12.2	5.2	9.0	4.9	0.2	0.8	2.3	3.1	4.9	4.3	4.0	3.5	1.7	3.1	3.6	3.3	2.1	3.6	2.2	3.2	1.0	3.2
Vietnam	1.2	3.2	0.8	3.2	11.0	4.7	14.4	9.2	0.8	4.3	3.1	3.6	6.2	5.5	4.8	4.4	0.8	2.8	0.9	2.7	0.6	2.1	1.8	2.9	1.3	3.4
Bangladesh	0.1	1.8	0.0	0.0	5.1	5.2	3.3	3.7	-2.0	-7.3	0.6	3.3	2.2	5.3	0.1	1.2	0.0	0.3	0.2	2.0	0.2	2.9	1.9	3.5	0.0	0.1
India	2.8	3.4	0.1	1.8	1.3	3.2	1.3	3.2	1.2	3.3	0.8	3.2	1.2	4.3	0.9	3.0	0.1	1.4	0.7	3.2	0.1	1.6	0.2	2.3	0.4	3.3
Sri Lanka	0.6	2.2	0.1	1.3	11.9	6.8	10.6	14.3	1.7	2.6	0.4	1.8	10.9	9.0	4.0	4.4	0.5	2.7	-0.2	-1.6	-0.2	-1.4	1.3	1.3	0.5	2.1
Rest of Asia	3.6	4.1	-0.1	-0.6	1.3	3.6	2.4	4.0	0.2	2.1	0.5	2.8	2.0	4.4	0.6	2.8	0.3	2.5	0.4	3.0	0.2	1.8	0.6	2.7	0.2	2.6
USA	-57.6	-4.8	-3.2	-4.3	-21.4	-7.0	-26.7	-6.0	-4.4	-6.5	-8.6	-3.3	-10.3	-4.9	-6.4	-4.0	-0.7	-5.7	-1.3	-4.7	-7.3	-11.0	-3.7	-6.0	-0.6	
Mexico	-3.7	-0.4	-1.2	-3.6	-5.5	-3.0	-34.1	-7.8	-5.3	-5.0	1.4	1.2	2.9	2.4	-0.2	-0.9	-1.0	-7.0	-0.4	-1.8	-2.2	-6.5	-0.2	-0.8	-1.3	-16.6
Canada	6.5	3.3	-9.7	-8.3	-8.9	-4.4	-9.2	-4.6	-3.3	-4.9	-7.6	-4.1	-2.7	-4.5	3.4	4.1	-1.6	-2.9	-9.6	-4.3	-5.2	-8.2	-2.1	-3.9	-1.7	-4.9
Colombia	1.1	5.6	-0.4	-1.3	15.3	4.7	4.5	4.3	1.1	2.3	4.3	3.1	4.8	3.8	6.8	4.7	-0.4	-4.2	0.4	2.2	0.7	2.7	0.4	2.2	0.0	-0.6
Venezuela	1.7	24.1	2.2	3.3	2.1	4.0	12.2	3.7	0.1	1.5	0.7	3.3	4.6	4.9	1.1	3.6	0.3	3.3	0.5	3.0	0.5	3.4	0.2	2.6	0.2	2.8
Peru	0.7	3.2	-0.4	-1.6	6.1	4.0	1.9	3.0	1.3	3.2	3.2	3.0	3.9	3.9	1.9	3.0	0.3	2.7	0.6	2.9	0.5	2.9	0.3	2.5	0.3	2.4
Rest of the Andean Pact	2.0	4.2	0.1	0.5	14.5	4.2	8.3	4.0	1.7	3.0	9.2	3.5	9.7	4.1	6.7	4.3	0.5	2.3	0.7	2.4	1.0	2.9	0.6	2.6	0.8	2.7
Argentina	8.6	4.5	2.3	2.8	18.9	4.0	17.5	4.4	1.5	10.0	7.6	2.9	6.4	3.2	5.6	3.3	1.5	2.7	2.2	2.7	2.3	3.0	1.8	2.8	0.9	3.4
Brazil	1.6	3.4	0.2	3.0	18.7	3.5	27.4	4.1	1.0	5.5	7.6	3.1	6.6	3.4	6.0	3.2	1.1	2.9	3.6	3.1	2.1	3.7	0.2	3.0	0.9	3.5
Chile	1.6	2.7	0.6	2.4	15.7	3.0	20.1	3.6	1.1	4.4	8.3	3.0	2.5	2.8	4.3	3.4	0.9	3.3	1.8	2.6	2.0	2.9	0.9	2.8	0.8	3.8
Uruguay	2.4	5.9	2.1	3.9	2.2	2.7	10.7	4.3	1.0	4.5	4.6	3.1	13.1	4.7	3.6	3.1	0.3	3.1	4.4	3.3	3.5	3.3	3.9	3.3	0.6	3.2
Rest of South America	43.4	8.1	2.7	4.0	24.0	4.0	21.4	4.1	2.3	3.1	5.2	2.8	14.4	3.9	6.8	2.9	1.8	2.7	4.0	2.6	3.6	3.0	2.3	2.8	1.5	3.0
Central America	26.8	19.3	-1.1	-1.2	18.8	3.9	26.6	4.1	4.9	3.2	11.9	3.2	8.3	3.2	10.7	3.2	-0.3	-1.3	1.9	2.4	2.2	2.8	1.5	2.4	0.1	0.4
Rest of FTAA	18.1	4.6	-3.1	-3.2	16.9	3.9	9.6	3.6	1.5	3.5	5.4	3.0	5.1	3.2	4.0	3.1	0.9	2.5	1.1	2.6	1.7	3.0	1.5	2.7	0.1	1.2
Rest of the Caribbean	3.1	4.8	-0.7	-2.2	12.6	4.4	2.7	3.3	0.8	2.9	1.8	3.0	1.7	3.9	3.4	3.6	-1.6	-3.3	1.2	3.0	1.2	3.0	2.0	2.9	0.4	2.5
European Union 15	-52.4	-5.9	-8.1	-5.0	-16.5	-5.3	-42.9	-6.2	-2.2	-5.9	-7.4	-3.3	-58.4	-6.1	-6.7	-4.1	-1.4	-4.4	-2.4	-4.3	-6.3	-10.4	-1.9	-4.2	-1.0	-8.2
Ceec	19.9	21.6	0.5	4.4	-8.2	-6.8	-4.1	-3.1	0.6	2.2	-0.3	-0.5	3.3	8.7	1.2	3.2	-0.5	-5.3	-1.7	-4.1	-1.8	-3.5	1.4	2.1	-0.9	-9.7
Turkey	8.1	8.2	3.0	3.0	8.0	3.6	6.6	3.4	3.9	3.5	2.7	3.0	2.1	3.3	4.0	3.3	0.0	0.5	1.5	2.9	0.6	1.9	0.6	2.7	0.0	0.4
Russian Federation	11.1	14.1	-0.1	-1.4	5.7	3.3	11.2	4.7	1.8	5.7	1.0	2.9	3.5	4.1	2.3	4.7	0.2	2.2	1.2	3.0	0.4	2.5	1.2	3.2	0.6	3.2
Rest of the Middle east	1.9	2.8	0.0	-0.4	10.6	3.8	5.4	3.7	1.0	2.4	0.8	3.0	7.2	4.3	1.2	3.7	-0.7	-4.4	0.1	0.7	0.5	2.2	3.0	3.0	-0.1	-1.7
Morocco	99.9	6.0	-0.7	-6.4	8.2	3.8	6.1	4.1	0.6	1.0	5.7	3.0	1.4	3.2	3.6	3.1	-0.5	-7.8	0.8	2.1	1.2	2.7	1.7	2.0	0.0	-0.2
Tunisia	32.0	4.4	5.7	3.9	13.9	3.5	20.9	4.3	19.4	4.1	3.6	3.3	1.6	1.1	2.8	3.8	0.5	1.7	1.2	2.4	1.4	2.3	1.2	2.2	0.6	2.3
Rest of North Africa	30.3	15.7	-5.1	-4.6	5.8	4.0	4.4	3.5	1.0	2.0	1.0	3.0	4.6	4.3	0.7	3.0	-0.3	-4.0	0.3	1.7	0.8	3.0	1.2	2.1	-0.2	-2.5
S. African Cust Union	9.4	9.3	0.9	5.7	14.0	3.2	19.7	3.6	1.1	3.1	11.0	3.2	7.2	3.5	3.5	3.6	1.1	3.4	1.4	2.9	0.9	3.2	0.8	3.2	0.6	3.3
Tanzania	2.0	3.5	0.9	3.3	2.2	2.8	6.4	3.4	1.0	3.4	1.3	3.2	9.5	4.9	2.8	3.1	0.2	2.8	0.5	2.6	1.1	2.9	4.5	3.2	0.2	2.8
Mozambique	2.0	4.4	1.4	4.6	1.9	3.4	26.7	4.6	1.3	4.2	0.6	2.9	13.3	7.8	1.5	2.9	2.3	3.1	0.3	2.4	0.9	3.3	2.4	3.4	0.7	2.8
Other Southern Africa	4.0	3.6	0.8	3.6	2.1	3.0	2.0	3.1	1.3	3.4	3.8	3.1	5.7	4.3	5.1	3.6	2.7	3.2	1.1	3.1	1.0	3.3	1.9	3.2	0.5	3.1
Madagascar	0.2	3.2	0.2	3.0	8.7	4.2	2.3	3.4	2.8	3.4	4.1	3.2	9.2	6.4	1.6	3.2	0.3	2.8	0.2	2.7	0.2	2.3	2.4	3.6	0.6	3.1
Uganda	0.6	5.5	-1.5	-2.9	3.0	3.5	4.7	3.4	3.5	7.5	0.2	2.3	10.7	6.8	8.2	3.8	0.5	3.2	0.9	3.1	0.2	1.8	1.7	3.0	0.7	3.1
Malawi	2.8	2.6	0.9	2.9	2.1	2.4	3.7	2.9	2.2	2.4	2.7	2.8	10.2	4.0	13.2	3.5	2.5	3.1	0.7	2.7	1.7	3.2	0.7	2.9	0.2	2.9
Rest of S- Saharan Africa	1.5	5.0	0.5	2.0	5.7	4.0	14.8	4.2	2.5	4.4	4.6	3.1	11.4	5.1	3.9	3.4	0.2	2.0	0.5	2.0	0.2	1.1	3.1	2.6	0.2	2.0
Australia	21.2	10.3	1.1	3.7	18.6	5.1	28.4	5.8	2.1	3.9	2.5	3.2	12.7	4.7	4.2	3.7	-2.0	-4.3	4.7	3.3	-5.8	-13.8	-2.9	-5.1	0.7	3.1
New Zealand	12.7	5.2	2.1	3.7	13.6	3.1	34.0	3.5	1.0	3.3	10.9	3.2	1.1	2.9	7.8	3.6	1.0	3.1	10.2	3.2	10.1	3.2	10.5	3.2	2.0	3.4
Rest of the world	2.1	5.1	0.7	3.3	4.2	3.3	8.7	3.7	2.1	3.6	1.5	3.2	7.4	4.6	3.0	3.4	0.7	3.3	1.7	3.3	1.3	3.3	2.3	3.0	0.8	3.1

source: own calculations

Table 9. Total welfare effect for individual countries and for (proxies of) countries and regions groups
(million US \$)

	allocative efficiency				terms of trade				total			
	decoupled only		coupled & decoupled		decoupled only		coupled & decoupled		decoupled only		coupled & decoupled	
	GE	PE	GE	PE	GE	PE	GE	PE	GE	PE	GE	PE
proxy for the <i>G-20</i>												
China	55	22	-254	-138	114	-399	-209	-681	99	-622	-436	-1,097
Indonesia	0	4	-5	8	7	-99	-40	-167	-3	-67	-46	-120
Philippines	0	8	-22	16	-25	-78	-30	-108	-24	-92	-49	-119
Thailand	2	17	-7	22	14	-53	14	-87	9	-21	11	-43
India	23	-62	-5	-105	38	-38	79	-62	57	-218	72	-312
Mexico	114	-3	191	65	-74	-349	-397	-685	35	-435	-199	-722
Rest of Asia	0	-10	-15	-18	-6	-54	-59	-119	-5	-116	-72	-201
Venezuela	1	-7	-3	-9	4	-95	-22	-125	5	-117	-25	-153
Rest of the Andean Pact	0	-7	1	-9	-5	-5	3	-6	-5	-5	3	-6
Argentina	14	100	52	159	67	30	339	61	81	108	390	193
Brazil	29	-7	38	-15	29	5	413	49	66	-108	496	-100
Chile	1	17	-1	22	3	-9	12	-11	2	-1	9	1
SACU	10	7	15	9	19	-24	28	-34	26	-8	43	-11
total	248	77	-16	8	186	-1,168	133	-1,974	343	-1,700	197	-2,688
proxy for the <i>Least Developed countries</i>												
Bangladesh	-1	0	-2	1	-1	-25	-28	-39	-1	-40	-31	-58
Mozambique	0	0	1	1	0	0	0	0	0	-3	1	-3
Tanzania	0	0	0	0	-1	-2	4	-2	-1	-6	6	-7
Madagascar	0	0	0	0	0	0	2	-1	0	-2	2	-3
Malawi	0	1	1	2	-1	2	2	2	-2	3	3	4
Uganda	0	0	0	0	0	0	4	1	0	-2	8	-3
Rest of S-Sahar.Africa	2	-12	-2	-11	-16	-128	54	-142	-14	-189	65	-215
total	1	-11	-3	-8	-19	-153	38	-181	-17	-239	53	-284
proxy for the <i>Net Food Importing Developing countries</i>												
Sri Lanka	0	-2	0	-3	-10	-17	-9	-20	-10	-22	-9	-26
Rest of Asia	0	-10	-15	-18	-6	-54	-59	-119	-5	-116	-72	-201
Rst of the Caribbean	3	-7	3	-9	2	-18	1	-21	7	-48	6	-60
Rest of FTAA	4	-12	-1	-15	-5	-75	-15	-107	0	-121	-14	-165
Peru	-2	-5	-5	-6	-6	-26	-13	-33	-8	-40	-18	-49
Venezuela	1	-7	-3	-9	4	-95	-22	-125	5	-117	-25	-153
Morocco	0	-42	-3	-46	-1	-69	-8	-82	-1	-120	-11	-140
Tunisia	2	-17	3	-16	0	-38	-2	-47	3	-63	1	-73
Rest of North Africa	2	-9	-5	-10	-38	-297	-83	-362	-34	-338	-86	-413
total	9	-111	-28	-132	-58	-689	-209	-916	-42	-984	-229	-1,279
proxy for <i>developed countries</i>												
Australia	27	-10	23	-21	59	169	201	192	85	99	224	96
New Zealand	1	0	3	-1	12	-10	39	-27	11	-13	37	-29
Japan	188	-357	192	-294	196	-1,091	-50	-1,515	312	-1,809	112	-2,244
South Korea	39	-35	-73	-127	-21	-184	-136	-280	9	-268	-193	-462
Canada	62	463	78	407	167	683	329	659	210	1,087	399	996
United States	566	3,482	1,545	4,747	850	2,990	2,132	5,107	1,667	4,030	3,591	6,768
EU-15	-1,156	7,789	-648	8,318	-1,399	649	-2,467	605	-2,591	10,401	-3,150	11,154
CEEC	88	119	77	114	-86	152	-61	101	-33	372	-27	322
total	-185	11,452		13,143	-221	3,358	-13	4,842	-330	13,899	993	16,600
proxy for the <i>Cairns Group</i>												
Argentina	14	100	52	159	67	30	339	61	81	108	390	193
Australia	27	-10	23	-21	59	169	201	192	85	99	224	96
Brazil	29	-7	38	-15	29	5	413	49	66	-108	496	-100
Canada	62	463	78	407	167	683	329	659	210	1,087	399	996
Chile	1	17	-1	22	3	-9	12	-11	2	-1	9	1
Colombia	-4	-22	-12	-30	-22	-48	-26	-62	-26	-86	-38	-112
Indonesia	0	4	-5	8	7	-99	-40	-167	-3	-67	-46	-120
Malaysia	9	-13	2	-20	-1	-121	5	-162	-3	-44	20	-63
New Zealand	1	0	3	-1	12	-10	39	-27	11	-13	37	-29
Philippines	0	8	-22	16	-25	-78	-30	-108	-24	-92	-49	-119
SACU	10	7	15	9	19	-24	28	-34	26	-8	43	-11
Uruguay	2	3	6	3	1	-2	2	-3	4	-4	9	-6
total	150	549		537	317	495	1,273	388	429	870	1,496	728
other countries												
Russian Federation	11	-61	-9	-73	39	-160	22	-194	42	-216	18	-256
Rest of World	5	-381	-33	-453	129	-403	169	-501	135	-997	133	-1,223
Rest of Middle East	-8	-67	-26	-85	15	-389	-60	-482	7	-625	-85	-778
Vietnam	-1	8	0	12	-1	18	19	25	1	-10	23	-9
Taiwan	-2	-17	-5	-22	-31	-265	-184	-419	-41	-293	-178	-450
Turkey	-8	-35	-27	-43	19	-53	-11	-105	11	-106	-38	-168
Central America	-8	-17	-21	-30	-38	-69	-28	-114	-45	-121	-46	-189
Oth Southern Africa	2	1	3	3	1	-10	8	-11	2	-13	12	-13
total	-8	-569	-118	-690	133	-1,330	-64	-1,801	113	-2,380	-162	-3,086
grand total	72	10,829	1,053	12,311	-1	0	-4	0	43	8,692	996	9,443

source: own calculations