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ASSESSING THE EFFECTS OF THE REFORM OF THE EU RICE COMMON MARKET ORGANISATION*

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January 2002

Abstract: The paper is aimed at assessing the effects of the reform of the Common Market Organisation for rice proposed by the EU Commission in 2000. AGLINK, the OECD partial model, is employed to simulate the effects for the EU as a whole, both in terms of deviations from the standard baseline, and from a modified baseline that includes *indica* and *japonica* rice as two different products. Results in terms of change in market prices are introduced as exogenous price shocks in a Positive Mathematical Programming Model, run for Italian rice-producing provinces on the basis of the Farm Accounting Data Network data, in order to assess the effects on local supply. Results indicate a fall in EU rice prices ranging from 15% to 25% as a consequence of the proposed reform, under the assumption that this implies a reduction in the level of border protection. A similar percentage change would occur in Italian production as a whole, though supply reductions would be lower in more specialised rice-growing areas.

Keywords: Common Agricultural Policy, Rice, AGLINK, Partial Equilibrium Models, Positive Mathematical Programming Models

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* Financial support from the Italian Ministry of University and Technological Research is gratefully acknowledged (Research Programme of National Scientific Relevance on “The WTO negotiations on agriculture and the reform of the Common Agricultural Policy of the European Union” co-ordinated by G. Anania).

1. Introduction

Almost 60% of the rice produced in the EU comes from Italy (Casati *et al.*, 1999), and particularly from few areas of the North West of the country; two of these alone – the Vercelli and Pavia provinces – account for more than 65% of the whole Italian production. Other EU productions are mostly located in Spain, Portugal France and Greece. The EU as a whole is a small net importer in the international rice market, accounting for 3.4% of world imports and for less than 1% of exports.

The present Common Market Organisation (henceforth CMO) is mainly based on the MacSharry philosophy, though it is separate from that for other arable crops. Intervention price was reduced by 15% over three years starting from 1996-97, and direct income support is granted at a lower level compared to other arable crops (52.65 Euro/ton), without land set-aside obligations. In order to fully access direct payments, planting needs to be maintained within a Maximum Guaranteed Area (MGA), which is defined at the national level. In terms of expenditure, the rice CMO accounts in 2000 for 0.6% of the EAGGF-Guarantee, and for less than 2% of the expenditure for arable crops from the same fund. Nonetheless, in absolute terms it has been increasing at a fast rate since the mid-1990s (Inea, 2001).

In terms of border protection, rice enjoys a *de facto* variable levy system like other cereals, partly limited by the Blair House agreement provisions¹ and by the URAA bound import tariff rate². Tariff-rate quotas are also important: roughly 40% of imports into the EU have taken place through these channels in the late 1990s, mainly from ACP, PTOM and Southern Asian exporters, but also from the US and Australia. On the export side, subsidisation is limited by the 1994 Uruguay Agreement on Agriculture (URAA), both in terms of quantity and expenditure.

From the mid-1990s the EU rice market has undergone a severe over-supply crisis, characterised by price falls and mounting intervention stocks. Production has increased significantly – by over 32% from 1995 to 2000 (OECD, 2001) - due both to favourable price conditions in the two previous years and to a set of bumper harvests, while demand has increased more slowly. As a result, prices of paddy rice have shown a fall ranging from 20% to 30% from 1995 to 1997 depending on the specific varieties. Intervention stocks in that period were made up for more than 90% of *japonica* rice - the one that is traditionally cultivated in Italy - while planting increased for the *indica* varieties, whose demand is relatively more elastic.

Foreign trade also contributed to increase pressure on EU prices in the same period. On the import side, preferential import quotas were granted in 1997 after the accession of Austria, Finland and Sweden in the EU. Increasing flows originated through triangular operation using PTOM and ACP countries as intermediate destinations; in 1998 an upper bound was defined at 160,000 tons per year for countries falling in both groups. Moreover, due to organisational difficulties in the implementation of the Blair House Agreement, the average reference world prices employed by the EU to calculate the *plafond* level was raised by 8%, leading, in fact, to an equivalent tariff reduction³. On the export side, the quantitative limit imposed on export subsidies become binding over the 1999-00 campaign.

¹ The *plafond* import price must not exceed the intervention price multiplied by the coefficient equal to 1.88 and 1.80 respectively for the *japonica* and *indica* rice.

² None of these two limitations have been binding over the last years: the average *plafond* price has been around 200 Euro/ton, while the URAA bound rate is 264 Euro/ton.

³ The so-called Cumulative Recovery System, put in place to enforce the *plafond* price system, allowed importers to claim for duty refunds if they can demonstrate that they paid a higher price compared to the one established by the EU. To overcome financial and organisational difficulties (partly arising from massive refund requests), the reference world price employed in the calculation of the *plafond* was raised by 8% in 1998 (Inea, 2001).

In Italy the crisis was perceived even more severely, for at least two reasons. First, despite the increasing planting of *indica* varieties, these represent today little more than 20% of total area (*Ente Nazionale Risi*, 2001), a share that is lower compared to other EU producers: as seen, the *japonica* suffered more in terms of prices and intervention stocks accumulation. Second, the exchange rate movements deepened the price variation: in 1993 and 1994 the devaluation of the *lira* implied a faster price growth compared to EU partners, and, thus, a competitive advantage for Italian producers in European markets. By the same token, the revaluation associated with the convergence of the country toward the Economic and Monetary Unit in the late 1990s implied a faster price decrease, and a loss of competitive advantages in EU markets (Nomisma, 1998).

Given this whole situation, in June 2000 the EU Commission (2000) has proposed a new reform of the CMO, aimed at: i) eliminating intervention, and substituting it with an aid to private storage to be granted under critical market conditions; ii) increasing direct support from the present level to the 63 Euro/ton granted to other arable crops, according to yields defined by Member States for specific areas; iii) making direct support conditional to set-aside obligations, as for other cereals; iv) including the rice MGA in the total cereal Base Area; v) substituting the *plafond* price system with a fixed import duty.

This proposal has raised deep concerns among almost all stakeholders in Italy (Agra Europe, 2000; 2001). The abandonment of the intervention system is regarded as something that would directly affect both domestic prices and border protection, since the enforcement of the current GATT bound rate appears as an unlikely perspective. This would put considerable pressure in the Italian specialised rice-growing areas, both on farmers and on the processing industry, that plays a key role in the local economies. Emphasis has been put also on the potential negative environmental effects of set-aside obligations, in terms of hydro-geological management, of the quality of water, and of biodiversity.

In the meantime, over the 2000-01 campaign the EU market situation has improved: bad weather significantly cut harvests, and intervention stocks were significantly reduced, especially in Italy, due also to massive sales for low price to the feed industry, and for food aid shipments. These developments have reduced, at least in the short run, the pressure toward a reform of the CMO.

The paper is aimed at providing a quantitative assessment of the reform proposed by the Commission (2000), based on two different models. The OECD AGLINK model is used to simulate for the EU as a whole the consequences of the new CMO; for this purpose it was employed first the OECD (2001) standard baseline, and then a modified version of that baseline, including *indica* and *japonica* rices as two different products. Results of these simulations in terms of change in market prices have been used as exogenous shocks in a Positive Mathematical Programming Model (PMP) (Paris and Howitt, 1998; Paris and Arfini, 1995), that has been run for Italian rice-producing provinces on the basis of the Farm Accounting Data Network (FADN) data, mainly to assess the likely effects of the reform on local supply.

Next section contains a description of the models employed, and of their strengths and weaknesses in this application both *per se* and in their joint use. The third section reviews the main results obtained, while the fourth one reports few concluding remarks.

2. The exercise

AGLINK is the model employed by the OECD and its Member States to produce the Medium Term Outlook, i.e. the annual forecast on agricultural markets. The models includes most important

agricultural markets of the Member States, and the EU as a single country⁴. Over the last decade, the model has been gradually and significantly improved, especially in terms of agricultural and trade policy modelling (Salvatici *et al.*, 2001)⁵.

Being partial equilibrium recursive dynamic, AGLINK generates endogenously a baseline projection in terms of world prices, domestic prices, domestic supply, demand and net foreign trade in all included markets. The OECD Secretariat and Member States concur to produce each year a new baseline - whose results are disseminated through the Outlook - including a *status quo* assumption about policies. This can be shocked to assess the effect of a policy change.

AGLINK employs an OECD database, which includes two different parts: an “historical” one, made up of time-series data mostly provided by Member States, that is employed to estimate parameters; and set of projections provided by Member States and drawn from specialised sources, such as the FAO, the USDA, the IMF, the World Bank.

The equations for the rice market in the EU takes the following form:

$$\begin{aligned} S_{ij} &= a + \exp(b * \ln RH(t-1) + \ln T) \\ Y_{ij} &= n + \exp(p * \ln PP_{ij} + q * T) \\ P_{ij} &= Y_{ij} * S_{ij} \\ RH &= (PP_{ij} * Y_{ij}) + AD_{ij} \\ C_{ij} &= c + \exp(d + f * \ln PP_{ij} + g * \ln GDP/POP + \ln POP) \\ ST_{ij} &= h + \exp(k * \ln PP_{ij}/PI_{ij} + m * \ln C_{ij}(t-1)) \end{aligned}$$

where:

(endogenous)

S = area

Y = yield per hectare

P = supply

RH = return per hectare

C = demand

ST = public stocks

PP = production price

and

i = EU

j = rice

a, c, d, h, n = calibration constants

b, e, f, g, k, m, p, q = parameters.

(exogenous)

POP = population

GDP = Gross Domestic Product

M = imports

X = exports

PI = intervention price

AD = direct payment

T = trend

The EU domestic price is determined through an equilibrium condition that balances total supply (production and imports) and total demand (consumption, exports and stock change). For the purpose of policy simulation, advantages of this type of modelling are mainly in the representation of direct semi-decoupled income support, and in the explicit representation of intervention, through endogenous public stocks. Concerning the first point, it should be noted that AD affects land allocation, but not yields; despite direct payments do affect also yields in reality, the modelling can be regarded as a reasonable proxy for the fact that they affect production decision to a limited extent; as it is known, mostly through the attitude toward risk, investment choices, and labour

⁴ Among OECD countries the model includes Australia, Canada, Japan, New Zealand, South Korea, Mexico, UE, USA. Several others are included only for few most important commodities. In terms of products the model includes all most important cereals, oilseeds, meats, dairy products and vegetable oils.

⁵ This paper also contains several insights about the effectiveness of AGLINK in modelling most important CAP measures, and agricultural trade policy measures.

allocation (Gohin et al., 1999)⁶. Concerning the second issue, it should be noted that public stocks, though in an empirical way, allows to model the effect of intervention on the market price, and thus the transmission of intervention price changes on market price.

At the same time, there are at least two major drawback of this representation: the exogeneity of foreign trade, and the absence of cross-price effects between rice and other arable crops, both in consumption and in production. The latter is difficult to justify, especially for production, although traditional rice farming in Italy requires highly specific investments; and, as far as demand is concerned, one may qualitatively conceive that rice is not easily substitutable in a high income context. Also the exogeneity of foreign trade is not easily justifiable; but this seems not to be a major difficulty for the purpose of this exercise: an important component of rice imports into the EU, the tariff-rate-quota, could not be taken into account as such in any case, given that the structure of trade in AGLINK is homogeneous, and does not generate bilateral flows.

In the modified baseline, the same equations reported above and the price determination were replicated separately for *japonica* and *indica* rices, by including cross-price effects between the two products both in consumption and in land allocation equations. Data is drawn from the EU rice Management Committees⁷.

For both baselines, the reform of the CMO envisaged by the Commission was represented through: i) an increase in direct support, corresponding in percentage to the difference between 52.65 and 63 Euro/ton; ii) a 30% reduction of intervention price, as a proxy for its substitution with the aid to private storage; iv) an exogenous 10% reduction of the land area, to approximate set-aside, less a fixed slippage effect. The inclusion of the MGA in the Base Area for cereals could not be represented.

Concerning the switch toward the fixed import tariff, given the uncertainty about the level of such tariff – that is meant to be defined by the Commission through negotiation - and the exogeneity of trade, two different scenarios were considered: i) scenario A, assuming that the reform does not affect border protection, and thus trade flows⁸; ii) scenario B, assuming that the reform does affect border protection, by an amount corresponding, in percentage, to the decrease of the price guarantee (-30%), with an import demand elasticity of 0.5%, similar to the one of domestic consumption. This yields a 15% exogenous increase in imports, that was introduced under scenario B. In the modified baseline, separating *indica* from *japonica* rices, the exogenous increase in export was applied solely to former, since almost all imports are actually made up of this product.

Coming to the PMP model, as known, this is a procedure derived from the Linear Programming (LP) applied to farm-level land allocation problems with a *normative* point of view, that assumes a *positive* one: observed farmers' behaviour is assumed to be optimising, and it is employed to estimate the underlying cost function. Based on this estimate, observed results are generated from the solution of a non-linear programming model, that can be used to test the reaction of farmers to a

⁶ An more accurate proxy could include a specific parameter linking *AD* to land; however a value for such a parameter is not available in practice.

⁷ Parameters for the two consumption equations were estimated with the SURE method over the 1992-00 period. In the run of the model, though, the cross-price parameter between *indica* and *japonica* in the equation for the former had to be calibrated, since the high value resulting from the estimation was determining unstable results. Estimation of the parameters for land allocation was also attempted, but this yielded problem of singularity; thus it was resorted to calibration and expert judgements also in this case.

⁸ This would be the outcome of a negotiation in which the Commission manages to maintain the fixed tariff close to the current applied rates.

change in an exogenous parameter of the problem, such as a market price, or direct support, or set-aside obligations (Paris and Howitt, 1998; Paris and Arfini, 1995)⁹.

The procedure can be described as being made up of three steps (Arfini and Paris, 2000). In the first, it is solved a LP problem using land availability constraints and a set of constraints that equal production to observed production for each activity. The dual solution of this problem yields the marginal cost. In the second stage, this marginal cost is used to estimate a total cost function of the quadratic form $x'Qx/2$, where x is production and Q is positive semi-definite. In the version reported by Arfini and Paris (2000), which is employed here, the estimate is based on the Maximum Entropy method, and the condition on the matrix Q is obtained through the Cholesky factorisation. Finally, in the third stage, the estimated total cost function is directly introduced in a quadratic programming problem, in which the farm gross revenue maximisation reproduces the observed land allocation among activities, given the existing (baseline) provisions in terms of direct support, set-aside and market prices.

In the procedure set by Arfini and Paris (2000), farms within one area are aggregated to reproduce, on a sample basis, the behaviour of a whole geographical aggregation. This allows to escape the definition of a farm with average characteristics. The sample employed here is the Italian FADN, and rice-growing farms have been aggregated at the provincial level. More specifically, within the Italian FADN database, it was considered, for all rice-growing provinces, the set of farms specialised in arable crops. Within this sets, farms were first aggregated by economic size units, and then at the provincial level.

The reform of the CMO has been modelled through: i) an increase in direct income support, on the basis of its area-specific level; ii) the 10% land set-aside; iii) two alternative market price reduction scenarios (1 and 2) derived from the results obtained with AGLINK.

A main advantage of the PMP procedure in this application is its ability to provide indication about the effects of policy based on a limited information set, and with reference to a specific area. Set-aside, contrary to AGLINK, is treated as an activity yielding a return in terms of direct payments, that is taken into account in the land allocation problem. Moreover, per hectare direct support are based on their area-specific level, rather than as an EU average. At the same time, the short-run approach of the PMP can be a drawback, particularly because it implies that yields are fixed: in turn, this means that direct support is considered as a fully “coupled” measure, since it has exactly the same effect of a corresponding price integration.

The joint application of the two models allows an assessment of the consequences at the local level of a change envisaged at the EU level; this may be an interesting information for policy makers, on the one hand, and also a promising way to overcome the limitation of each of the two models on the other. The joint application, however, also suffers from at least two major drawbacks. First, using an endogenous price change generated at the EU level as an exogenous shock for a lower level application requires that the price formation at the EU level is not affected by what happens in the single localities to which the PMP is applied: in other words, the exercise assumes that Italian rice-growing areas are “small” with respect to the EU market. As seen, this may be a rather strong hypothesis for some of them. Second, the two models are deeply different in terms of time frame and cross-price effects: AGLINK results, generated over the medium-term without including cross-price effects, are included in the PMP, which is short-run and fully based on cross-price effects. Moreover, a general limitation of the exercise is the absence of indications about the statistical

⁹ Also for the PMP, an assessment of major advantages and drawbacks in the modelling of agricultural policy changes is in Salvatici *et al.* (2001), with special reference to the CAP.

reliability of most parameters involved. Finally, it should be recalled that the Italian FADN sample is not designed to be representative of a single crop.

3. The results

These have been grouped according to the three proposed simulation experiments, concerning, respectively, the effects of the reform for rice as a single aggregate at the EU level, for *indica* and *japonica* rice separately at the EU level, and for supply in Italian rice-growing provinces.

For rice as a whole, the OECD (2001) AGLINK standard baseline indicates that a new phase of downward pressure on domestic prices may emerge after year 2003. Production in that period is projected to increase faster than consumption. Under scenario A, in which the reform proposed by the Commission (2000) has no effect on foreign trade, there is an increase in domestic market price (Table 1), arising from the combined effect of set-aside and the reduction in the guaranteed price level - that is assumed to approximate the switch toward the aid to private storage - and from the fact that production decreases faster than consumption.

Under scenario B - that is qualitatively credited more probability by stakeholders - assuming that the reform implies a 15% increase in imports, the situation changes markedly: the effect on domestic price becomes a strong downward pressure - ranging from 15% to 23% - due to consumption increasing and production decreasing with respect to the baseline. Stocks would still decrease under this scenario, but less than under the previous one, due to the downward pressure on domestic prices and to the buying-in.

Comparing these two scenarios for rice as a whole, the EU market appears to be more sensitive to border protection than to the domestic price guarantee: in other words, the effect of a change in trade flows appears to dominate, in the model, the effect of a change in the intervention price level. This is qualitatively consistent both with the broad consensus - emerged among Italian stakeholders - that the price crisis of the late 1990s was mainly the result of increased imports into the EU; and with the idea - widely debated a few months ago by the Italian farmers' Unions - that the effects of the elimination of the intervention could not be so dramatic, provided that the GATT bound import duty could be applied, or, more in general, provided that the reform would not affect substantially the current protection level.

The modified baseline that was obtained with AGLINK by separating *indica* from *japonica* rice (Figure 1) shows that both supply and demand of the first product should moderately increase in the EU, while a decreasing supply of *japonica* should face a more or less constant demand. In terms of stocks and prices, this means that *indica* may encounter more problems than *japonica* over the medium term. Given that the parameters on which these results are based were estimated over the last decade (and/or calibrated on the recent past), the model seems to be mostly telling that, should the actual path of substitution in production from *japonica* toward *indica* continue over the next years, over supply may appear more for this latter product than for the former.

The effects of the CMO reform on this modified baseline appear to be mostly similar to those found for rice as a single product. Under scenario A - i.e. assuming the reform does not affect border protection and trade - the domestic price increases, especially for the *japonica* rice, while that of *indica* shows a moderate decrease. Under Scenario B, both prices show a decrease, up to 23% for the first product, and up to 29% for the second, despite *indica* shows a higher average reduction, due to its more direct exposure to the increase of imports. Production decreases for both rice types, while consumption strongly raises for *indica*, and decreases moderately for *japonica*. Stocks decrease compared to the baseline is higher for *japonica*, that does not suffer directly from the increase in imports.

Coming to the effects of the reform in Italian rice-growing areas, also in this case the assessment was conducted with reference to two different scenarios – called scenarios 1 and 2 to allow distinction from the previous ones - in terms of market price change. These are chosen by considering the lower and the upper bounds of the AGLINK simulations results reported above, under the assumption that the reform does affect border protection: thus scenario 1 corresponds to a 15% decrease in market price, while scenario 2 corresponds to a 25% decrease.

On average, total Italian production would decrease by approximately the same amount of the price reduction (Table 3). Among single areas, a clear distinction emerges between specialised rice-growing areas (particularly Vercelli, Pavia, Novara and Alessandria), and less specialised ones (almost all the others). In the former, the output reaction is, on average, smaller than in the latter, possibly due to two reasons: first, the highly specific investment required by traditional rice farming reduces the number of alternative crops; and, second, a supposedly more efficient production technology and scale should allow more farmers to remain in business under the reform scenario. In the areas where rice is a relatively less important activity, production may decrease significantly, and even disappear, as in the case of Oristano province.

The degree of specialisation in rice production can also explain the results in terms of total final output: in the more specialised areas the effect on this variable is higher, given that rice accounts for a higher share of total output, whereas in less specialised areas it is smaller, if not positive: once more, in the extreme case of Oristano, the disappearance of rice farming would lead to an increase of the total final output. The overall gross margin – i.e. the difference between the final value of output and variable costs – can be regarded as a proxy for farmers' income in the short run. This variable too appear to change in proportion with the importance of rice in single provinces: more in the specialised areas, and less in the non-specialised ones.

Finally, it is interesting to note that land shadow prices would decrease only in few most specialised rice-growing areas, and only under the more radical price change scenario, whereas it raises in virtually all other cases: this indicates that the increase in direct payments mostly dominates the projected price reductions in terms of the marginal value of land.

4. Concluding remarks

Main insights provided by the paper can be summarised in six points.

1. The effects of the reform proposed by the EU Commission (2000) at the EU level crucially depends on the assumption about its consequences on border protection. This, in turn, dominates domestic measures - the intervention price level, set-aside, direct support changes - especially in terms of the effect on market price. Under the hypothesis that the reform does have an effect on trade flows, EU domestic prices should decrease from 15% to 25%.
2. Altogether, EU rice production appear to suffer from a lack of competitiveness with respect to imports. Aside from short run reasons such as weather variability or exchange rates movements, both the qualitative analysis of market developments, and the quantitative exercise indicates that this is the main reason underlying the crisis of the late 1990s.
3. Considering separately *japonica* and *indica* rice, the exercise shows that, under a *status quo* scenario, the former may be subject to stronger price pressure and intervention stocks increases over the medium term, given that the actual path of substitution in production away from *japonica* rices persists. This means that such substitution, encouraged also by the Commission since the early 1990s, may mostly move the over-supply problems in the same direction, rather than help equilibrating the market over the medium term.

4. Under the assumption that it does have an effect on trade flows, the reform proposed by the EU Commission (2000) may foster the increase in the demand for *indica*, whose price and supply would be more directly affected by increased imports.
5. In Italy, given the EU-level price reduction scenario, supply should decrease by a similar percentage on average, although specialised rice-growing provinces should experience a lower decrease, probably due to their the relatively higher competitiveness.
6. Changes in total output and gross margins appear consistent with the relative importance of rice among agricultural activities in different Italian provinces: both appear higher, on average, in specialised rice-growing areas. Changes in land shadow prices indicate that with the proposed reform, the increase in direct support may more than compensate market price reductions in most case, the exceptions being few specialised areas under the 25% price reduction scenario.

Considering altogether the above picture, the strong political resistance that the EU Commission (2000) proposal has encountered, the latest developments of the EU markets, and the low incidence of the rice CMO in terms of expenditure, one may wonder if the implementation of any change in the support system is likely today. However, from an international perspective the reform of the CMO appears more likely, and possibly urgent. On the one hand, the variable border protection, that is required to guarantee domestic price support, is based on a measure that is forbidden by WTO rules, and that survives thanks to the Blair House agreement: from this point of view, the EU appears to be in a rather weak position, given the extent to which border protection seems to affect the domestic market. On the other hand, this same border protection level appears politically difficult to sustain in the long run, given that several rice exporters are low and middle-income countries.

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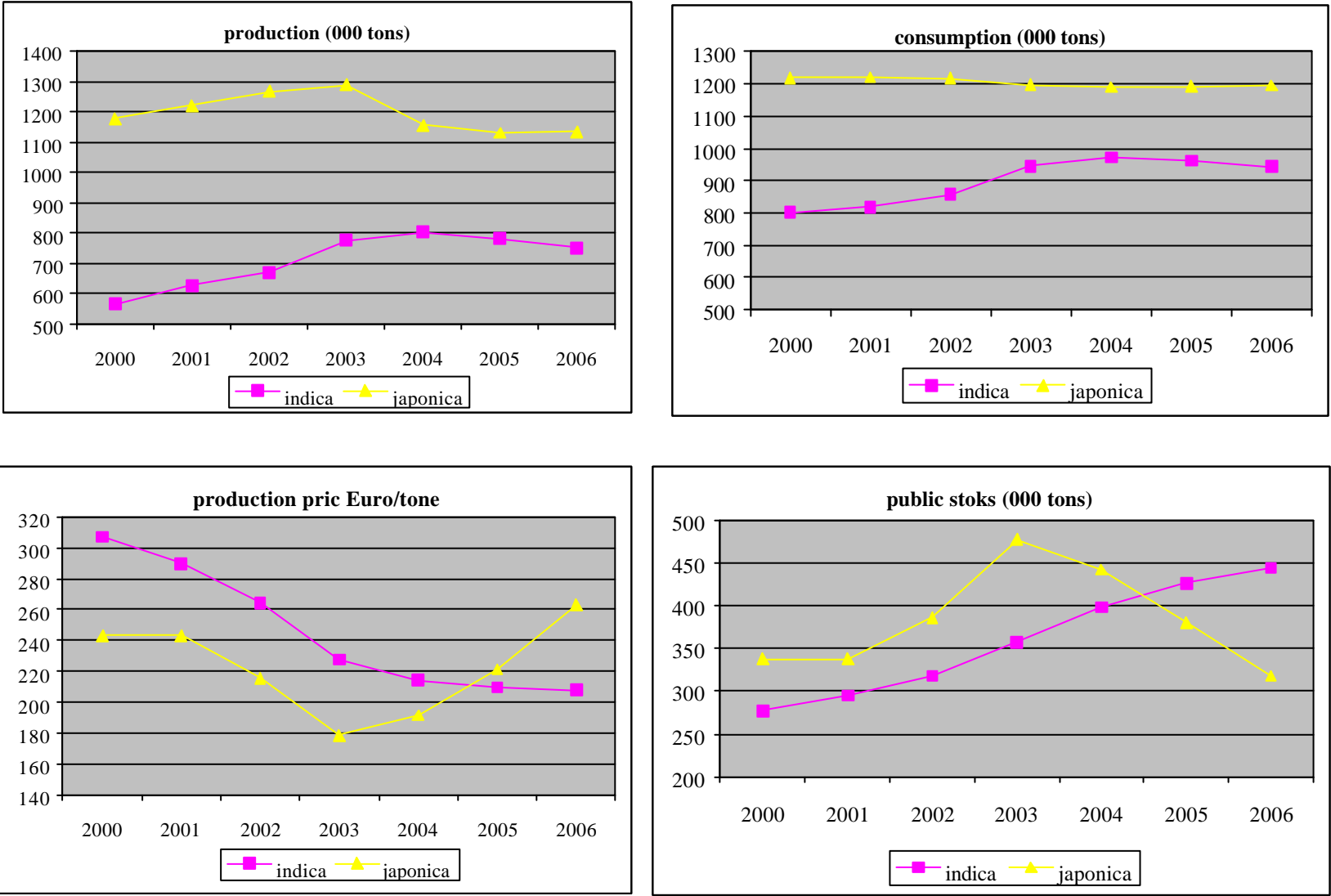
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Table 1. Percentage deviation from the standard 2001 AGLINK baseline. Rice

	2000	2001	2002	2003	2004	2005	2006
<i>scenario A</i>							
<i>exogenous</i>							
direct payment	0.0	0.0	19.7	19.7	19.7	19.7	19.7
intervention price	0.0	0.0	-30.0	-30.0	-30.0	-30.0	-30.0
<i>endogenous</i>							
production price	0.0	0.0	-2.0	15.4	20.9	22.4	22.7
consumption	0.0	0.0	0.5	-3.5	-4.7	-5.0	-5.1
production	0.0	0.0	-7.2	-7.2	-6.8	-6.7	-6.7
public stocks	0.0	0.0	-22.1	-31.2	-35.8	-39.8	-44.0
<i>scenario B</i>							
<i>exogenous</i>							
direct payment	0.0	0.0	19.7	19.7	19.7	19.7	19.7
intervention price	0.0	0.0	-30.0	-30.0	-30.0	-30.0	-30.0
imports	0.0	0.0	15.0	15.0	15.0	15.0	15.0
<i>endogenous</i>							
production price	0.0	0.0	-23.4	-18.9	-17.0	-15.9	-15.5
consumption	0.0	0.0	7.0	5.4	4.8	4.5	4.4
production	0.0	0.0	-7.2	-7.9	-7.7	-7.7	-7.7
public stocks	0.0	0.0	-6.6	-10.3	-12.3	-13.9	-15.8

source: calculations on OECD data

Figure 1. Modified *baseline* separating *indica* from *japonica* rices in the EU



source: calculations on OECD data

Table 2. Percentage deviation from the modified baseline. *Indica* and *japonica* rices

	2000	2001	2002	2003	2004	2005	2006
<i>scenario A</i>							
<i>exogenous</i>							
direct payments <i>indica</i>	0.0	0.0	19.7	19.7	19.7	19.7	19.7
direct payments <i>japonica</i>	0.0	0.0	19.7	19.7	19.7	19.7	19.7
intervention price <i>indica</i>	0.0	0.0	-30.0	-30.0	-30.0	-30.0	-30.0
intervention price <i>japonica</i>	0.0	0.0	-30.0	-30.0	-30.0	-30.0	-30.0
<i>endogenous</i>							
production price <i>indica</i>	0.0	0.0	6.6	0.3	7.9	4.0	9.7
production price <i>japonica</i>	0.0	0.0	13.7	20.1	8.6	40.2	29.2
consumption <i>indica</i>	0.0	0.0	6.0	0.7	-6.7	-2.0	-10.2
consumption <i>japonica</i>	0.0	0.0	-1.3	-1.5	2.2	-1.4	6.7
production <i>indica</i>	0.0	0.0	-4.3	-2.2	-12.1	-3.1	-16.3
production <i>japonica</i>	0.0	0.0	-7.0	-11.2	-5.8	-4.3	-25.6
public stocks <i>indica</i>	0.0	0.0	-25.1	-29.0	-34.0	-32.8	-37.6
public stocks <i>japonica</i>	0.0	0.0	-18.9	-41.9	-36.0	-50.1	-1.4
<i>scenario B</i>							
<i>exogenous</i>							
direct payments <i>indica</i>	0.0	0.0	19.7	19.7	19.7	19.7	19.7
direct payments <i>japonica</i>	0.0	0.0	19.7	19.7	19.7	19.7	19.7
intervention price <i>indica</i>	0.0	0.0	-30.0	-30.0	-30.0	-30.0	-30.0
intervention price <i>japonica</i>	0.0	0.0	-30.0	-30.0	-30.0	-30.0	-30.0
imports of <i>indica</i>	0.0	0.0	-15.0	-15.0	-15.0	-15.0	-15.0
<i>endogenous</i>							
production price <i>indica</i>	0.0	0.0	-22.8	-17.0	-13.2	-13.8	-14.3
production price <i>japonica</i>	0.0	0.0	-28.7	-10.2	-9.8	-2.7	-11.6
consumption <i>indica</i>	0.0	0.0	26.3	19.1	14.1	15.3	15.3
consumption <i>japonica</i>	0.0	0.0	-6.7	-6.0	-4.4	-5.3	-4.7
production <i>indica</i>	0.0	0.0	-4.3	-6.1	-11.3	-8.5	-11.7
production <i>japonica</i>	0.0	0.0	-7.0	-13.7	-4.4	-6.3	0.5
public stocks <i>indica</i>	0.0	0.0	-9.3	-9.3	-9.0	-5.7	-7.5
public stocks <i>japonica</i>	0.0	0.0	-1.8	-23.4	-25.0	-31.3	-24.1

source: calculations on OECD data

Table 3. The effect of the CMO reform in Italian rice-growing areas

(% change compared to 1999 status quo)

	rice output		total output (all crops)		gross margin (all crops)		land shadow price	
	scenario 1	scenario 2	scenario 1	scenario 2	scenario 1	scenario 2	scenario 1	scenario 2
Vercelli	-14.63	-19.98	-19.84	-26.32	-14.29	-20.94	1.08	-13.08
Pavia	-12.09	-16.62	-18.68	-24.97	-11.74	-18.22	3.82	-9.27
Novara	-11.96	-18.02	-20.41	-30.36	-14.09	-24.90	0.00	0.00
Alessandria	-14.77	-24.59	-16.91	-23.76	-12.12	-16.77	3.90	-0.96
Torino	-23.97	-38.23	-7.76	-7.79	-5.13	-5.19	13.45	13.15
Biella	-15.05	-21.86	-18.69	-24.92	-11.55	-17.10	18.20	1.84
Milano	-20.33	-41.42	-13.99	-18.97	-10.97	-13.22	0.00	0.00
Mantova	-25.39	-56.85	-4.38	-3.97	-5.22	-5.27	2.73	1.61
Verona	-16.90	-28.26	-8.23	-8.94	-6.21	-6.57	8.59	8.36
Rovigo	-19.22	-32.37	-8.56	-9.18	-6.84	-7.18	6.21	5.90
Ferrara	-20.17	-33.68	-9.98	-11.40	-7.70	-8.49	5.75	4.86
Oristano	-100.00	-100.00	2.96	2.96	-3.52	-2.04	-2.03	-2.03
Grosseto	-14.17	-23.68	-11.26	-14.78	-6.56	-9.20	37.51	33.04
Total	-14.73	-22.73	-13.25	-17.05				

source: calculations on OECD data