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Efficient support policy for a highly-subsidising, and small country

The case of the Austrian bread grains market[1]

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(With 2 figures)

Summary

Concentrating on the Austrian bread grains market the paper provides helpful insights into the question of efficient policy instrument use for a highly-subsidising, and small country. A surplus transformation curve framework is used to find for the amount transferred to bread grains farmers in 1991 and the used policy instruments (floor price, output control, and co-responsibility levy) the best policy in terms of Pareto efficiency. It is shown that a superior combination of the used instruments would have decreased the transfer costs by nearly 25 % (635 million ATS). In addition, the paper investigates whether alternative policy instruments (deficiency payments, direct income support, and two-price plan) would have improved the transfer efficiency. The study shows that for a small country either a floor price *cum* output control or a deficiency payments *cum* output control program – equivalent to a fully decoupled direct income support policy – is the most efficient. Which one is superior depends on the marginal cost of public funds.

Key-words: efficient income redistribution, welfare economics, Austrian bread grains market.

Effiziente Stützungspolitik für eine hoch subventionierte und kleine Volkswirtschaft: Fallstudie für den österreichischen Brotgetreidemarkt

Zusammenfassung

Dieser Beitrag vermittelt anhand des österreichischen Brotgetreidemarktes tiefere Einsichten in das Problem der effizienten Politikinstrumentenwahl für kleine und hoch subventionierte Volkswirtschaften. Mit Hilfe des Konzepts der

[1] The author would like to thank E. Robert A. BECK, David S. BULLOCK, Markus F. HOFREITHER, and Franz SINABELL for helpful comments and discussion on earlier drafts.

Transfereffizienz wird versucht für die Höhe der Einkommensunterstützung der Brotgetreidebauern im Jahre 1991 und die damals verwendeten Politikinstrumente (Mindestpreis, Produktionskontrolle und Mitveranwortungsabgabe) eine Pareto optimale Agrarpolitik zu finden. Es kann gezeigt werden, daß bei einer besseren Kombination der damals verwendeten Instrumente die Kosten um rund 25 % (635 Millionen öS) niedriger gewesen wären. Zusätzlich versucht die Studie zu klären, ob alternative Politikinstrumente (Ausgleichszahlungen, Direktzahlungen und Zwei-Preissystem) die Umverteilung effizienter gestaltet hätten. Es wird gezeigt, daß für eine kleine Volkswirtschaft entweder eine optimale Kombination von Mindestpreis und Produktionsbeschränkung oder eine optimale Kombination von Ausgleichszahlungen und Produktionsbeschränkung – gleichzusetzen mit Direktzahlungen – die effizienteste Unterstützung bieten. Welche der beiden effizienter ist, hängt von der Höhe der Zusatzlast der Besteuerung (excess burden) ab.

Schlüsselwörter: effiziente Einkommensumverteilung, Wohlfahrtsökonomik, österreichischer Brotgetreidemarkt.

1. Introduction

In 1992 the Austrian agricultural sector produced a gross output of 64 billion ATS (appendix: table 1). For the same period the OECD (appendix: table 2) estimated that total transfers generated by agricultural policy amounted to 46 billion ATS (1 ECU = 14.2 ATS in 1992). This is equivalent to transfers per head and month of more than 500 ATS. Total transfers can be separated into those paid by consumers and those paid by taxpayers with almost 75 % paid by consumers (OECD 1992c, p. 59). The reached level of burden for consumers and taxpayers led to modifications of the agricultural policy in many industrialised countries – in Austria, for example, to the implementation of a supply control program for bread grains in 1988.

As illustrated by SALHOFER (1993a, 1993b) for the rye market, this alteration from a pure floor price policy to a combination with output control, increased the efficiency of support, i. e. the same assistance level for producers could be achieved at lower cost to consumers and taxpayers[2]. The purpose of this paper is to investigate if alternative levels of the used policy instruments (floor price, output control, and co-responsibility levy) or the use of alternative policy instruments (deficiency payments, direct income support, and two-price plan) would have caused lower cost at the same transferred income. Though the agricultural policy regime in Austria will change with the EU accession, the used method and the empirical results give useful insights into the question of efficient policy instrument use for small countries.

In the subsequent sections, the Austrian bread grains market and the current support policy are surveyed, the methodology used in the study is presented, possibilities for improving the efficiency of income redistribution are discussed, and finally, some implications for the Austrian agricultural policy are pointed out and some limitations discussed.

[2] SALHOFER estimated that in 1990 the welfare gains of this alteration amounted to 83 million ATS. Considering that rye comes to 20 % of bread grains, the gains for the entire bread grains market can be estimated at more than 400 million ATS.

2. Structure and support of Austrian bread grains market

Austrian bread grains (durum, wheat, and rye) are highly-subsidised commodities, as illustrated by a PSE of 68 % for 1992 (appendix: table 3). A high floor price burdens consumers (CSE = −63 %) and causes a degree of self-sufficiency well over 200 %. Surplus production in combination with a large deviation from the world market price, confirmed by a Producer Nominal Assistance Coefficient (NAC) of 3.14 (appendix: table 3), results in a heavy budgetary burden. In 1991, for example, the export restitution payments for bread grains amounted to 1.8 billion ATS, compared to an output of 3.8 billion ATS[3].

Figure 1 diagrammatically illustrates the Austrian bread grains market in 1991; D is the domestic demand, S the domestic supply, S_c the output control and W the foreign demand/supply line, both perfectly elastic at the prevailing world-market price because of the small-country assumption. The support for bread grains farmers is in terms of a floor price p of 3,797 ATS/t (metric ton) backed by import controls and export subsidies[4]. Production has exceeded consumption since the end of the 1970s and, therefore, farmers have had to pay a co-responsibility levy. Hence the net producer price is reduced from p to p′ (3,525 ATS/t). In spite of this levy, the production surplus continued to increase and so, since 1988, bread grains have been subject to quota restrictions, which are defined by acreage and quantity. Thus bread grains farmers can deliver by contract the quantity q_c (993,769 t) at the price p′. Quantities which exceed the quota can be delivered at a reduced price r (2,911 ATS/t), or r′ (2,735 ATS/t) without the co-responsibility levy. This leads to a total supply of q_s (1,290,694 t) and a producers' surplus (PS_i) of *abcde*.

Without intervention the world-market price w (994 ATS/t) would apply. Austrian farmers would produce the quantity q_w and obtain a producers' surplus (PS_n) of *fge*. The income redistributed to farmers, i. e. the surplus achieved by producers ($\Delta PS = PS_i - PS_n$), due to the policy intervention is *abcdgf*. Because of the floor price consumers have to pay p instead of w. Consumption is there-

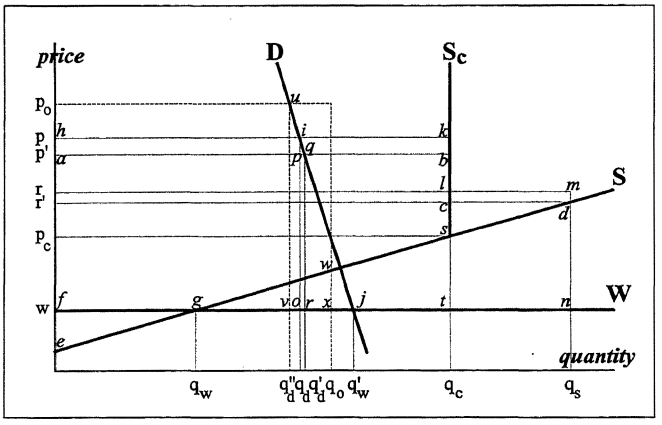

Fig. 1: Austrian bread grains market

[3] For the structure of the Austrian bread grains market see ASTL (1991, 1993), MANNERT (1991), ORTNER (1991), SALHOFER (1993 c) as well as appendix: table 4, table 5, and table 6.

[4] For the computations I use the data of 1991 because, owing to the drought, 1992 was an atypical year for grain production. All 1991 prices and quantities of bread grains are drawn from GWF (1993). Prices are weighted average prices of rye, wheat and durum. For the world-market price, the average export price for 1991 is used (appendix: table 7).

fore q_d (613,861 t) instead of q'_w and the lost consumers surplus (ΔCS) is *hijf*. The intervention influences the budget in two ways: on the one hand, there are expenditures due to export restitution payments *(iklmno)*; on the other hand, revenues result from the co-responsibility levy *(hkba + lmdc)*. After subtracting overlapping areas *(ikbp* and *lmdc)*, the budget's gains and losses are represented by *pbcdno* and *hipa*, respectively. Neglecting the excess burden of taxation, the net budgetary costs (ΔBD) can be equated with losses to taxpayers of the same amount *(pbdcno – hipa)*. Summing all welfare changes (ΔW=ΔPS + ΔCS + ΔBD) gives us the deadweight losses associated with this agricultural policy, as illustrated by the sum of the two triangles *ijo* and *dng*.

To compute these surpluses, the linear demand and supply curves and elasticities developed in some recent studies are used. SCHNEIDER and WÜGER (1988) estimated the demand for wheat and rye flours with singular equations and equation systems (LES, AIDS). Using statistical criteria, they selected as best parameters their (uncompensated) own-price elasticities for wheat and rye flours of –0.2 and –0.4, and income elasticities of –0.3 and –0.5, respectively. Using these results I chose a demand elasticity of –0.3.

NEUNTEUFEL and ORTNER (1989) estimated a supply elasticity for wheat in Austria of 1.13 using a simultaneous static model for agricultural products. The multiple regression is based on time series data from 1961 to 1987. FISCHER et al. (1988), in a Food and Agricultural Model of Austria (FAMA), first estimated parameters based on data from 1961 to 1976 and subsequently made an ex-ante simulation. This yielded a supply elasticity of 1.28 for wheat in Austria in 1991. However, I prefer the more recent result because of the greater number of observations. Therefore I assume a supply elasticity of 1.13.

The elasticity on a linear curve is, of course, not constant, so the quoted elasticities are reached at present prices and quantities of demand (p, q_d) and supply (r', q_s). As in many other agricultural economic studies, the welfare measure here is the Marshallian consumer's surplus instead of the Hicksian "exact" welfare measure (ALSTON and LARSON 1993).

3. Concept of efficient income redistribution

The method applied is based on the concept of efficient income redistribution, introduced by JOSLING (1969, 1974) and systematised and improved by GARDNER (1983, 1987 a). The objective is to find the policy with the lowest social costs, given the available policy instruments and certain transfer levels. The outcome is a welfare economic measure (transfer efficiency) that shows what proportion of the expenditure by the subsidising group (consumers plus taxpayers) is transferred to the subsidised group (producers). The measure can be represented in a simple diagram with a surplus transformation curve (STC), and it is this that makes it suitable for agricultural policy decision-making. Furthermore the OECD (1992 a, 1994) intends to intensify the use of this analytical method to promote agricultural policy reform.

Since many studies on this topic are predominantly theoretical (ALSTON et al. 1993; ALSTON and HURD 1990, CHAMBERS 1993, GARDNER 1983, 1987 a, HOFREITHER 1992 a, JOSLING 1974, MAIER 1993 a, MUNK 1989, OECD, 1992 a, 1994), an empirical application is presented here, in line with BULLOCK (1992 a, 1994, 1995), BURRELL (1993), CRAMER et. al (1990), GISSER (1993), DE GORTER and MEILKE (1989), HARVEY and HALL (1990), KOLA (1993) and MAIER (1993 b). The paper deals, as do KOLA (1993) and MAIER (1993 a), with the problems of a highly-subsidising, small-country exporter. It tries to go further than the cited

papers in its comprehensive and empirical search for the most efficient policy for a certain market, given the six often-examined support policies: floor price, deficiency payments, direct income support, output control, co-responsibility levy, and two-price plan. The search for efficacious intervention instruments is not, as in most other studies, limited to simple policies. It also attempts to find the optimal combination of two instruments, as do ALSTON et al. (1993), BULLOCK (1994, 1995), GISSER (1993), and MAIER (1993 a). To obtain a more complete description of the problem, the indirect welfare costs (deriving from the collection of taxes to finance the support) are also taken into consideration (ALSTON and HURD 1990). It will be shown, that for a highly-subsidising, small-country exporter, a high floor price in combination with output control is an efficient and, under some circumstances even the most efficient, policy. The study in hand is normative, as opposed to those by BULLOCK (1992 b, 1992 c, 1994, 1995), VON CRAMON-TAUBADEL (1992), GARDNER (1987 a, p. 345–376, 1987 b), MACLAREN (1992), OEHMKE and YAO (1990), and RAUSSER and FOSTER (1990), who linked this concept with political preference functions.

Following JOSLING (1969) and GARDNER (1983) deadweight losses in themselves are not sufficient for comparing the efficiency of different policy options. If the main objective of an intervention is to redistribute income to producers, welfare losses have to be seen in connection with the transferred assistance level. The concept of transfer efficiency deals with this by dividing the transferred producers' surplus by the surplus from consumers and taxpayers taken as a single group[5]. I consider the average transfer efficiency, ATE, to be defined as:

$$ATE = \frac{\Delta PS}{\Delta (CS + BD)} \cdot 100 \qquad (1)$$

Since consumers and taxpayers suffer loss, while producers gain, ATE can take a value between -100 % and 0 %. An ATE of -100 % means that no deadweight losses arise through redistribution, 0 % that none of the burdens on consumers and taxpayers are transferred to producers. An ATE of -80 % implies that for every 0.8 ATS transferred to producers, consumers and/or taxpayers have to pay 1 ATS. As MAIER (1993 b, p. 132) as well as HARVEY and HALL (1990, p. 24) emphasise, ATE is the appropriate measure if the main aim of this study is to find a more efficient way of redistributing a certain amount of income to farmers. (The marginal transfer efficiency is a better indicator if changes in the intensity of the present intervention mechanism are investigated.)

The ATE can be shown in a simple diagram as a surplus transformation curve (STC). The curves in figure 2 illustrate the ATE for alternative policy options. The origin represents the situation with no intervention. Based on the assumed demand and supply functions, the transferred producers' surplus in 1991 was 2,232 million ATS *(0a)*. The costs to consumers and taxpayers amounted to 3,254 million ATS *(ab)*. This means that the average transfer efficiency *(0a/ab)* is -68.59 %, which represents a welfare cost of more than 31 %[6]. So STC1 provides information about the ATE for each level of redistributed income for the pres-

[5] Of course there are different income redistributions within these groups for alternative policy options. For example, if we assume that poorer people spend a greater part of their income on bread and that the tax system is progressive, a change to a budget intensive policy, like deficiency payments, will benefit the poorer people, while a floor price policy will benefit higher income groups.

[6] The ATE at point *b* can also be computed from the tangent of the angle included between the line from the origin to *b* and the horizontal axis.

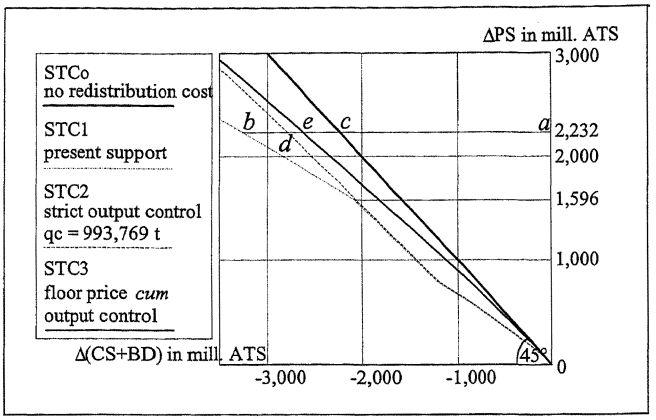

Fig. 2: Transfer efficiency of alternative support policies

ent support policy[7]. In the case of no redistribution costs, the STC would be a 45° line (STCo). Hence the deadweight losses of the present support are *bc* (966 million ATS). In this graphical representation, a redistribution policy is more efficient, the more the STC lies to the 'northeast'.

4. Increasing the efficiency of income redistribution

Optimal combination of present intervention instruments

As DE GORTER and MEILKE (1989, pp. 597–598) argued, a co-responsibility levy can be viewed as a floor price policy in combination with a domestic consumption tax and hence it is never more efficient than a pure floor price policy[8]. From figure 1, it can be seen that abolishing the co-responsibility levy and fixing floor prices at p′ and r′ keeps the producers' surplus at the same level but reduces the consumer price to p′, and therefore increases the consumers surplus by *hiqa*. On the one hand, the budget is disburdened by a higher domestic demand *(pqro)* while, on the other hand, the net revenues from the levy *(hipa)* are lost. All in all, by abolishing the levy there are welfare gains of *iqro*.

Table 1

Efficiency of alternative support policies

Support policy	ATE	Prod. / Cons. price	Output	ΔPS	ΔCS	ΔBD
	%	ATS/t	1000 t	mill. ATS	mill. ATS	mill. ATS
Present support (1)	−68.59	3,525/3,797	1,290.694	2,232	−1,927	−1,327
Strict output control (2)	−80.05	3,609	993.769	2,232	−1,811	−977
Floor pr. cum outp. contr. (3)	−85.23	4,347	694.084	2,232	−2,258	−361
Difference (3)–(1)	24.26[a]	822	−596.610	0	−331	966

[a] 100*(−85.23+68.59)/(−68.59)=24.26

[7] STC1 is computed by increasing the price p, and consequently ΔPS, continuously, starting at the world-market price w, retaining the difference between p and r and the co-responsibility levy at the same intervals. Therefore following this curve from the origin to the 'northwest' the first kink appears when p′ is increased beyond p_C. From there output control is effective and the ATE increases. The second kink appears when r′ exceeds p_C. Beyond this point, it makes economic sense to produce more than the contract quantity. The policy becomes less efficient and the curve becomes flatter again. All three parts of this curve are slightly concave.

[8] BULLOCK (1992a, 1995) shows that this need not hold in the large-country case.

The current agricultural policy involves a pure floor price policy and a combined price and output control policy. The greater the price gap between p′ and r', the more rigid output control gets. From figure 1, it can be seen that the possibility of delivering bread grains beyond contract quantity q_c yields a small additional surplus to producers *(cds)*, but raises budget expenditure considerably *(cdnt)*. It is for this reason that, beyond a transfer of 1,596 million ATS, strict output control ($p_c = q_s = 993{,}769$ t) is more efficient than the present mode of support with the possibility of delivering quantities beyond the quota (STC2 lies northeast of STC1 in figure 2). This transfer level is reached when the restricted net producer price (r′) becomes higher than p_c. Beyond this point it makes economic sense for the farmers to produce more than the contract quantity. To reach the 1991 transferred producers' surplus of 2,232 million ATS with strict output control, the price has to increase to 3,609 ATS/t (table 1). Though this causes additional losses for consumers, these are outweighed by the budget gain. Overall, maintaining the producers' surplus at the same level, a change from the present mode of support to strict output control at q_c without a co-responsibility levy brings gains for consumers and taxpayers amounting to 466 million ATS (*bd* in figure 2 and table 1). The transfer efficiency for this alternative policy is 80.05 %; an improvement of 11.46 percentage points or a percentage improvement of 16.71 % compared with the status quo.

In realising that a change to strict output control is indeed able to increase the efficiency of income redistribution, a question arises regarding the optimum output control. In figure 2, STC3 represents the transfer efficiency curve where output control and floor price are combined in an optimal way. Deadweight losses are minimised for every producers' assistance level. This is done by minimising $\Delta(CS + BD)$ subject to a given ΔPS. The resulting non-linear programming problem can be solved numerically with Newton's approximation method. Further, I shall call this policy floor price *cum* output control, whereby "cum" indicates that these two simple policies are applied in combination, and an italicised *"cum"* expresses that the combination is optimal.

As shown in table 1, the current contract quantity is too high and the minimum price too low to be optimal for the support transferred to producers. The optimum output (q_o in figure 1) is about 694,084 t with an optimum floor price (p_o) of 4,347 ATS/t. Fixing price and quantity at these values would increase the transfer efficiency by a further 7.55 % and bring additional gains for consumers and taxpayers of 169 million ATS (*de* in figure 2). The higher the transferred producers' surplus, the less STC2 and STC3 differ, because the optimal quota q_o and the present contract quantity q_c tend to converge. All in all, changing the present bread grains support program to a floor price *cum* output control policy without the co-responsibility levy would increase transfer efficiency by nearly 25 % and would bring gains to consumers and taxpayers of 635 million ATS in 1991, while maintaining producers' assistance at the same level.

Alternative support policy

The above leaves open the question of whether alternative policy options could increase the efficiency of income redistribution. Three basic support policies are commonly examined in the literature: floor price, deficiency payments and output control. A fourth policy sometimes considered is a two-price plan, a policy that can be interpreted as a floor price cum deficiency payments program with a floor price for domestic consumption and an export price that lies

between the world market price and the domestic price. However, MAIER (1993a) has demonstrated that such a policy is always inferior to floor price *cum* output control[9]. An optimal combination of two simple policies must be at least as efficient as each of the two policies separately (BULLOCK 1995, DIXIT 1990, chapter 5). Therefore, only deficiency payments *cum* output control could be more efficient than the proposed floor price *cum* output control policy.

In figure 1, the sum of the two overlapping triangles *ujv* and *wxg* represent the deadweight losses for the floor price *cum* output control policy. A change to deficiency payments cum output control policy with the same price and quantity (q_o, p_o) eliminates the welfare costs on the consumer side and therefore the triangle *ujv* vanishes. Consequently, ignoring the excess burden of taxation, deficiency payments cum output control must be a more efficient policy instrument. It can be easily shown that a further reduction in output would also diminish the deadweight losses on the production side. The most efficient policy would be to fix output control at q_w, the non-intervention output, giving deficiency payments to farmers as large as necessary to reach the desired income redistribution. Thus, a deficiency payments *cum* output control policy (remember that an italicised *cum* indicates an optimal combination) is the most efficient support policy as long as the costs of public funds are neglected (ALSTON and HURD 1990, p. 150): no deadweight losses appear, and this policy would be represented by STCo in figure 2. This policy is equivalent to a fully decoupled direct income support policy[10].

Cost of public funds

ALSTON and HURD (1990), ALSTON et al. (1993), and CHAMBERS (1993) pointed out that, for the evaluation of farm programs, it is important to take the marginal excess burden (MEB) of taxation into account to get a full estimate of taxpayers' costs. For this reason we have to multiply the budgetary burden (ΔBD) by the marginal cost of funds (MCF), where MCF is (1 + MEB)[11].

The magnitude as well as the exact theoretical foundation of the MCF are still the subject of discussion (FULLERTON 1991, OECD 1994, pp. 30–34). Various studies have developed estimates that lie in the range 1.17 to 1.55 (HAGEMANN et al. 1988).

To determine, for a given support level, the magnitude of MCF at which the transfer efficiency of a floor price *cum* output control policy (TE_f) equals the transfer efficiency of a direct income support policy (TE_d), I proceed as follows:

$$\frac{\Delta PS_d}{\Delta CS_d + MCF \cdot \Delta BD_d} = \frac{\Delta PS_f}{\Delta CS_f + MCF \cdot \Delta BD_f} \qquad (2)$$

[9] If export price equals the world-market price, a two-price plan can be defined as output control policy with permission to export any quantity at the world market price. For a small, exporting country, not forced to take terms-of-trade effects into account, this is always superior to a pure output control policy. In Austria's case it is not relevant, because at the world market price, domestic demand exceeds domestic supply.

[10] The consequences of a shift from price support to direct income support for the input sectors are discussed in WEISS (1992).

[11] I take the marginal values because agricultural expenditure accounted for 1.6 % of the total budget in Austria in 1991 (OECD 1992b, p. 350).

Because of the given support level, $\Delta PS_d = \Delta PS_f$. In the case of a direct income support, $-\Delta BD_d = \Delta PS_d$ and $\Delta CS_d = 0$. Solving equation (2) for MCF:

$$MCF = \frac{-\Delta CS_f}{\Delta PS_f + \Delta BD_f} \tag{3}$$

So, for a producers' assistance level of 2,232 million ATS, direct income support and floor price *cum* output control are equally efficient when the MCF is 1.207, which approaches the lower limit of many estimates. If the MCF is below this value, direct income support becomes more efficient. Even in such a case, bearing in mind the budgetary pressures many governments are facing, it is politically more acceptable to increase the consumer price than to increase taxes.

5. Discussion and conclusions

The purpose of the paper is to discuss the efficiency of income redistribution with alternative policy instruments for highly-subsidising, and small countries. Taking the Austrian bread grains market as a typical example of such a market it is shown that transfers to farmers in 1991 could have been considerably cheaper only by combining the used instruments programs (floor price, output control, co-responsibility levy) more efficient. It is shown that the inefficiency of the used policy came principally from the large and expensive exports. Therefore, abolishing the possibility of delivering quantities of bread grains above the quota would increase the efficiency of income redistribution significantly. The same is true for increasing the difference between the higher contract price and the reduced price and abolishing the co-responsibility levy. Further welfare gains could be achieved, if price and quota are combined in an optimal way, by minimising consumers' and taxpayers' costs for a given producers' assistance level. Based on the 1991 data, the optimum quota is estimated to be somewhat higher than half of the then output quantity and the optimum price lies almost 23 % above then current one. All in all, a change of the used support policy to that proposed increases the transfer efficiency by nearly 25 %. Though the higher price causes consumers to pay 330 million ATS more, it unburdens the budget by approximately 1 billion ATS.

In addition, the study shows that, if one analyses the conventional support programs (floor price, deficiency payments, output control, two-price plan, and co-responsibility levy), either a floor price *cum* output control or a deficiency payments *cum* output control will be the most efficient (the latter equals a fully decoupled direct income support policy) for a small country. Which is superior depends on the marginal cost of public funds.

The major limitations are well-known and inherent in static, single-market analysis. Substitution effects in related markets, as well as income leakages to input and middlemen sectors have not been taken into consideration here. Because of the static framework, it is not possible to analyse structural changes. But output control programs can lead to structural changes that depend on the arrangements for quota transfer, and they can therefore lead to additional social costs not observed in this study (BURRELL 1991, OECD 1990, pp. 13–37). Direct income support, on the other hand, is rarely decoupled and hence can bear a lot of distortions beside the mentioned excess burden (KJELDAHL 1993, OECD 1990, pp. 33–53). As MUNK (1989) and HOFREITHER (1992b) stated, administrative and enforcement costs must also be considered when drawing final conclusions. Environmental impacts of the different policy

options are not taken into account (GARDNER 1991). Each of these limitations provides scope for improvement of the analysis, and can therefore be interpreted as suggestions for further research.

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Appendix

Table 1

Gross output and gross domestic product of agriculture and forestry

	1989	1990	1991	1992
		bill. ATS		
Gross Output				
Crop	20.533	22.480	22.923	20.170
Animals	41.882	43.304	44.056	44.105
Agriculture	62.415	65.784	66.979	64.275
Forestry	14.707	16.386	11.496	11.774
Agriculture and Forestry	77.122	82.170	78.448	76.049
Inputs	-24.836	-25.491	-25.483	-25.969
Contribution to GDP (market prices)	52.286	56.679	52.965	50.080
Subsidies	3.986	4.630	5.282	8.549
Indirect taxes	-1.065	-1.298	-1.754	-1.371
Contribution to GDP (factor cost)	55.207	60.011	56.493	57.258
Depreciation	-16.412	-16.916	-17.669	-18.353
National income	38.795	43.095	38.824	38.905

Source: WIFO

Table 2

Total transfers associated with agricultural policy

Year	Transfer from taxpayers bill. ATS (1)	Transfer from consumers bill. ATS (2)	Budget revenues bill. ATS (3)	Total transfers bill. ATS (1)+(2)-(3)
1988	12.344	30.862	1.234	41.972
1989	10.584	26.461	1.323	35.722
1990	12.508	32.978	1.137	44.349
1991	14.009	35.023	1.167	47.865
1992	14.288	32.972	1.099	46.161

Source: OECD (1993, p. 159 and p. 316)

Table 3

PSE, CSE, and NAC for wheat

Year	Gross percentage PSE	Producer NAC	Percentage CSE	Consumer NAC
1987	76	3.68	−60	3.41
1988	70	3.05	−56	2.86
1989	37	1.57	−36	1.59
1990	65	2.68	−56	2.54
1991	73	3.43	−65	3.27
1992	68	3.14	−63	3.07

Source: OECD (1993, pp. 250–252)

Table 4

Supply of bread grains

Year	Contract			Feed			Bread grains
	Wheat 1000 t	Rye 1000 t	Total 1000 t	Wheat 1000 t	Rye 1000 t	Total 1000 t	Total 1000 t
1980/81	877.243	270.447	1,147.690	37.519	4.015	41.534	1,189.224
1981/82	741.809	200.646	942.455	35.332	2.932	38.264	980.719
1982/83	870.376	228.087	1,098.463	32.984	4.214	37.198	1,135.661
1983/84	1,035.112	205.852	1,240.964	31.991	2.217	34.208	1,275.172
1984/85	1,104.033	239.987	1,344.020	36.127	5.796	41.923	1,385.943
1985/86	1,125.229	220.788	1,346.017	26.179	2.098	28.277	1,374.294
1986/87	1,024.904	174.891	1,199.795	15.240	1.003	16.243	1,216.038
1987/88	1,112.283	211.705	1,323.988	19.223	1.893	21.116	1,345.104
1988/89	908.644	182.890	1,091.534	254.589	51.888	306.477	1,398.011
1989/90	819.130	202.094	1,021.224	141.209	41.247	182.456	1,203.680
1990/91	837.857	214.001	1,051.858	185.277	47.520	232.797	1,284.655
1991/92	821.906	186.416	1,008.322	222.474	56.965	279.439	1,287.761

Source: ALFIS and GWF (1993)

Table 5

Domestic demand (=milling) of bread grains

Year	Wheat 1000 t	Rye 1000 t	Total 1000 t	Self sufficiency %
1980/81	447.707	171.971	619.678	192
1981/82	453.542	169.929	623.471	157
1982/83	435.733	165.747	601.480	189
1983/84	428.658	159.905	588.563	217
1984/85	432.182	161.020	593.202	234
1985/86	440.700	156.410	597.110	230
1986/87	440.779	151.091	591.870	205
1987/88	437.333	161.828	599.161	224
1988/89	447.157	132.113	579.270	241
1989/90	457.658	138.347	596.005	202
1990/91	470.165	135.485	605.650	212
1991/92	482.708	131.153	613.861	210

Source: GWF (1993); self sufficiency is computed by total supply of bread grains (out of table 4) divided by total demand.

Table 6

Export and import of bread grains

Year	Weight			Value			Realised export price
	Export	Import	Net export	Export	Import	Net export	
	1000 t	1000 t	1000 t	1000 ATS	1000 ATS	1000 ATS	ATS/kg
1961–65	27.069	77.383	−50.314	44.237	156.912	−112.676	1.63
1966–70	8.551	67.902	−59.351	14.258	128.661	−114.403	1.67
1971–75	52	31.645	−31.593	282	69.274	−68.992	5.39
1976	106.971	13.391	93.580	270.570	50.912	219.658	2.53
1977	22	4.909	−4.887	136	13.807	−13.671	6.27
1978	235.297	1.124	234.173	485.244	3.102	482.142	2.06
1979	210.227	2.867	207.360	427.406	15.355	412.051	2.03
1980	172.141	103	172.038	438.830	570	438.260	2.55
1981	283.295	177	283.118	757.674	1.129	756.545	2.67
1982	301.789	929	300.860	850.829	4.829	846.000	2.83
1983	633.702	776	632.926	1,685.997	4.413	1,681.584	2.66
1984	569.809	331	569.478	1,714.094	2.339	1,711.755	3.00
1985	698.726	85	698.641	1,935.350	1.126	1,934.224	2.77
1986	593.686	267	593.418	999.040	3.410	995.630	1.68
1987	497.720	280	497.441	528.423	2.422	526.001	1.06
1988	902.784	152	902.632	1,078.826	1.571	1,077.255	1.20
1989	496.095	240	495.855	1,170.716	2.442	1,168.274	2.36
1990	555.661	492	555.169	696.159	4.047	692.112	1.25
1991	396.488	196	396.293	346.379	2.284	344.095	0.87

Source: ALFIS

Table 7

Supply, prices and co-responsibility levy in 1991

	Supply	Gross producer price	Average gross producer price	Co-responsibility levy	Average co-responsibility levy
	1000 t	ATS/t	ATS/t	ATS/t	
Quality wheat	330.362	4,295		250	
Milling wheat	441.807	3,485		310	
Durum	35.184	4,950		100	
Milling rye	186.416	3,435		250	
Contract bread grains	993.769		3,797		272
Feed wheat	222.474	2,895		180	
Feed rye	56.965	2,845		180	
Feed durum	17.486	3,325		100	
Feed bread grains	296.925		2,911		176
Bread grains	1,290.694				

Source: ALFIS and GWF (1993)

(Manuskript eingelangt am 23. Jänner 1995, angenommen am 27. März 1995)

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