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1 Introduction

Sunflower seed (sunseed) is a crop for which Ukraine definitely has a comparative advantage. Over the last decade Ukraine has accounted for 10-16% of the total world production of sunseed and for 5-39% of the total world trade in this product. Sunseed is also the basis for the country's vegetable oil industry, which had a market share of about 16% on the world sunflower oil (sunoil) market in 1999-2000. Of course, while producers are interested in higher domestic sunseed prices, sunoil producers (crushers) prefer lower prices and sufficient supply of cheap raw materials. As a consequence, it is no wonder that Ukrainian policy makers have repeatedly been confronted with the issue of export taxes for oilseeds. In October 1999, a 23% export tax was introduced. In July 2001 this tax was cut to 17%. A further cut has been proposed, but this proposal has encountered fierce resistance from the sunseed crushing lobby, which has proposed the introduction of a production subsidy for farmers instead that would compensate for the losses caused by depressed domestic prices for sunseed.

Even though export taxes have not become a major issue in trade negotiations and have not explicitly ruled out by the WTO (OECD 2003), they are more widely used than might be expected, particularly by countries exporting primary commodities. About one-third of all WTO members imposed export taxes (PIERMARTINI 2004). In particular, the following characteristics can be found among users of export taxes: They are often used by low and medium income countries with a high dependence on a single commodity for GDP and export earnings. Export taxation is further encouraged in the presence of weak domestic taxation systems, but also by high world market shares of the country, the latter offering terms-of-trade gains when export supply is restricted by export taxation. Finally, the presence of an underdeveloped or inefficient processing sector is often used as a justification to impose taxes on the exports of raw materials in the tradition of the infant industry argument. To some degree the oilseed export tax imposed by Ukraine can be explained by all of the above aspects and is therefore typical to a certain extent, which, however, does not mean that it is economically justified.

The aim of this paper is to give an overview on recent developments in the sunseed sector in Ukraine, investigating the degree of 'optimality' of the current export tax rate, and then empirically analyse policy options regarding the export tax. Our analysis employs the recently developed partial equilibrium 'Regionalised Agriculture Sector Model for Ukraine' (*RASMU*). Our main findings are: I) the export tax currently used for

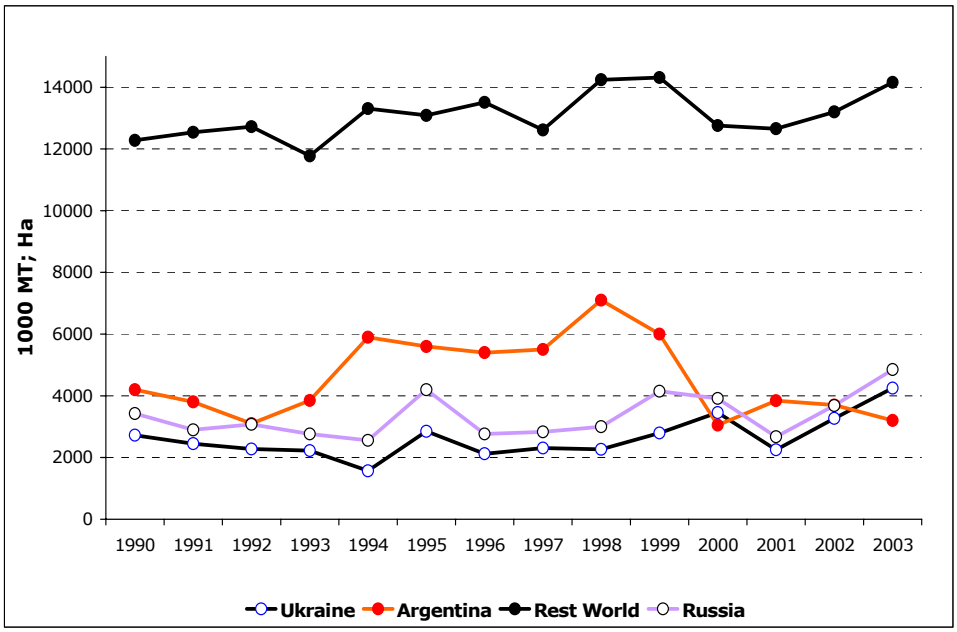
oilseeds in Ukraine is probably twice as high as the theoretically optimal value, II) the low 'optimal' tax rate derived in our analysis suggests a marginal overall welfare gain from the tax, rendering it effectively idle, and III) a compensatory production subsidy for sunseed producers, as recently proposed, would compensate them for the losses they incur as a result of the export tax, but at a considerable cost. It would also perpetuate the rents received by sunseed crushers.

2 The Sunflower Sector in Ukraine

2.1 Sunseed production

Sunflower seed is one of the major crops produced in Ukraine, and among the world's largest producers Ukraine is ranked the third, after Argentina and Russia (Graph 1). World sunflower seed production has been increasing over the last decade, from 23.5 million tonnes (MMT) on average in the mid-1990s to 26.26 MMT in 2003/2004. Ukraine has followed this trend as its sunseed production grew modestly over the period 1990-2003. Graph 1 shows that the volume of production increased from 2.72 MMT in 1990 to 4.25 MMT in 2003, but for the remaining years was comparable to 1990.

Graph 1
Production of the main sunflower seeds producers



Source: PS&D, **www.fas.usda.gov/psd/psdselection.asp**

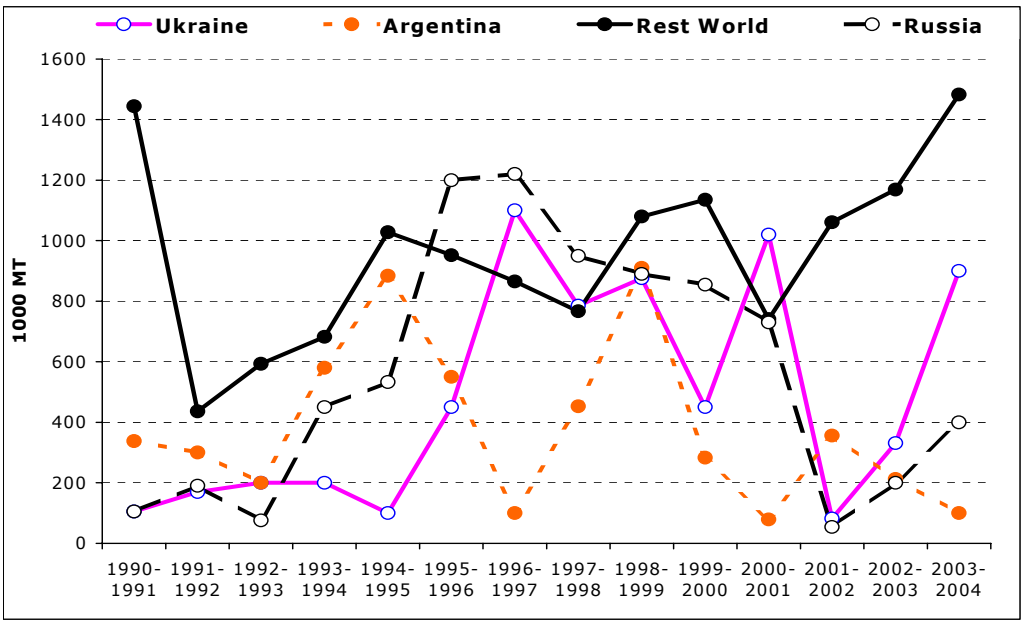
The best growing conditions can be found in the steppe climatic zone, and almost 90% of Ukrainian sunseed production is concentrated in the eastern and southern oblasts and on large farms. Sunseed accounted for only

about 15% of the total harvested area in Ukraine in 2003. However, in the main producing regions this share is much higher (e.g. 32% Dnipropetrovsk and 42% in Donetsk) and clearly higher than the recommended maximum share in crop rotations (20-25%). Indeed, many producers grow sunseed every two years on the same plot. If this practice continues, declining yields will probably constrain further production growth. The 1990s have already witnessed a decline in average yields.

Although sunseed yields less gross revenue per hectare than winter wheat or barley, it is still said to be more profitable than competing crops. According to FAO estimates, average gross revenue for sunseed in 2001 and 2002 was 173 US$/ha, compared with 187 US$/ha for winter wheat. After subtracting average variable costs, gross profits were 101 US$/ha for sunseed and 82 US$/ha for winter wheat. The difference is mostly to the lower seed costs for sunflower (26 US$/ha for sunseed versus 55 and 50 US$/ha for winter wheat and barley, respectively). Net profits for sunflower seed and winter wheat were 46 and 9.1 US$/ha, respectively.[1]

While Ukraine is one of the three largest sunseed exporters, Ukraine's world market share is not stable due to widely fluctuating harvests at home and abroad (Graph 2).

Graph 2
Export by the main sunseed exporters



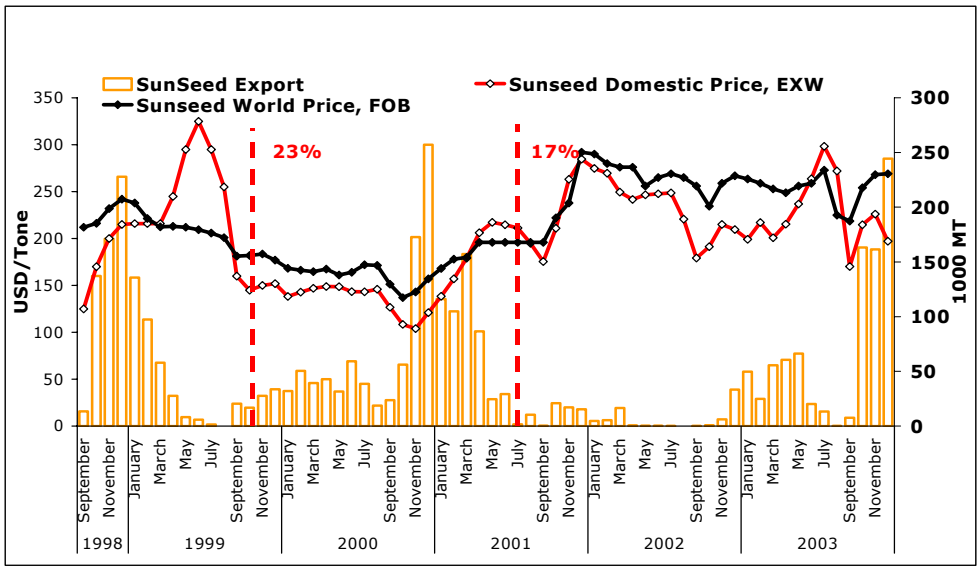
Source: PS&D; www.fas.usda.gov/psd/psdselection.asp

Graph 3 provides a monthly retrospective on Ukrainian exports and prices of sunseed between 1998 and 2003. After the introduction of the 23% tax, a differential between domestic and world market prices emerged in late

[1] Actual revenues, costs and profits will vary across regions, farms and time. Data on the profitability of different crop in Ukraine is also presented in Chapter 10.

1999-2000 (16% on average), which, however, faded in the course of 2001 due to loopholes in the administration of the tax. The lowering of the tax rate to 17% in 2001 was accompanied by the closing of these loopholes, and a gap between domestic and international prices (13% on average) emerged in 2002.

Graph 3
Ukrainian Sunseed Exports and Price Development



Source: UkrAgroConsult

Table 1
Sunseed Balances in Ukraine (1998-2004)

Sunflower Seed (1000 MT)	*1998/ 1999*	*1999/ 2000*	*2000/ 2001*	*2001/ 2002*	*2002/ 2003*	*2003/ 2004*
Beginning Stocks	8	10	87	15	5	25
Production	2266	2794	3457	2251	3270	4252
Imports	2	2	1	1	1	1
Total Supply	2276	2806	3545	2267	3276	4278
Exports	876	450	1020	82	331	900
Processing	1300	2100	2330	2070	2800	3200
Food Use	25	29	30	30	30	30
Other use	65	140	150	80	90	120
Total Domestic Consumption	1390	2269	2510	2180	2920	3350
Ending Stocks	10	87	15	5	25	28

Source: PS&D, www.fas.usda.gov/psd/psdselection.asp

Table 1 summarises sunseed commodity balances over the period during which the oilseed export tax was in force. It is characterised by two developments. First, despite the introduction of the export tax, sunseed production tended to increase throughout the period, probably because of the bullish world market trend. Second, while production grew, exports

fluctuated around a more or less constant trend as domestic crushing of sunseed expanded. This may be interpreted as a result of the export tax which helped the crushing industry to acquire raw materials for lower prices than would have prevailed without the tax.

2.2 Overview of the crushing industry development

The volume of sunseed processing in Ukraine has followed a U-shaped trend with little net change over the last decade. The volume of sunoil produced dropped from 0.92 MT in 1992/93 to 0.45 MT in 1996/97, and then recovered to 1.2 MT in 2002/03. In the mid-1990's, producers and traders found exporting more lucrative than selling sunseed to domestic crushers, who could simply not compete with foreign rivals. Low processing efficiency was a key feature of domestic crushers at that time (VON CRAMON, 1999), as due to outdated technology and high energy consumption processing costs varied between 29 and 60 US$/t, compared with 27 US$/t in Western Europe. Due to a lack of liquidity, 80% of sunseed processing was conducted under tolling schemes, according to which crushers took 20% of the sunoil produced as their processing charge. Crushers only paid cash for 16% of the sunseed they procured, oil extractors paid in cash and the rest was bartered. Hence, producers and traders preferred to sell abroad for cash. However, sunseed processing and production of sunoil increased significantly after the export tax on oilseeds was introduced.

Table 2 shows that production of sunoil gradually increased from 1998/99 onwards, 2001/02 was an exception due to the bad harvest in 2001. About 50% of Ukrainian sunoil is consumed domestically, and the rest is exported. According to FAO estimates, bottled sunoil accounts for about ¾ of total domestic vegetable oil consumption.

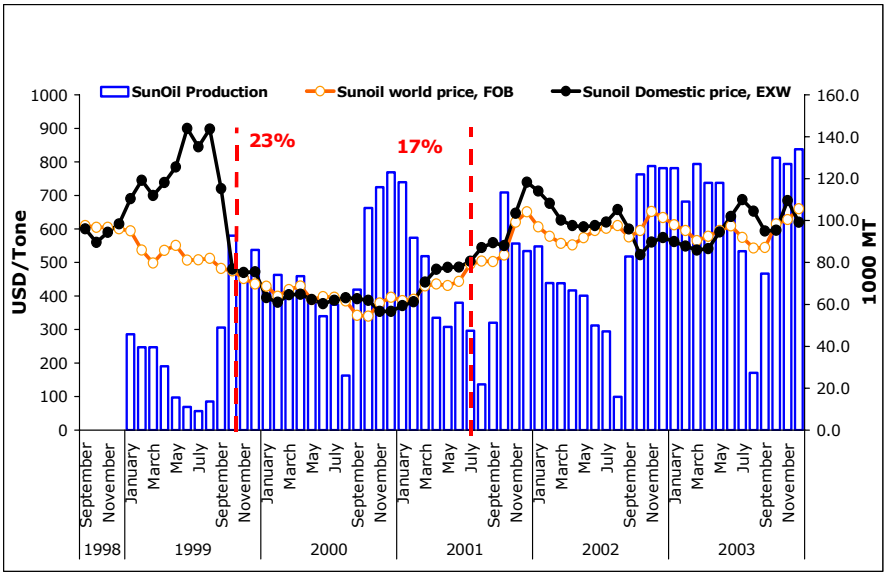
Table 2
Sunoil Balances in Ukraine (1998-2004)

Sunflower Oil (1000 MT)	*1998/ 1999*	*1999/ 2000*	*2000/ 2001*	*2001/ 2002*	*2002/ 2003*	*2003/ 2004*
Crush	1300	2100	2330	2070	2800	3200
Beginning Stocks	9	7	12	15	10	19
Production	530	840	970	850	1200	1300
Imports	30	0	0	0	0	0
Total Supply	569	847	982	865	1210	1319
Exports	205	430	550	423	911	950
Industrial Use	10	10	10	10	10	10
Food	345	380	400	417	270	339
Other uses	2	15	7	5	0	0
Total Domestic Consumption	357	405	417	432	280	349
Ending Stocks	7	12	15	10	19	20

Source: PS&D, www.fas.usda.gov/psd/psdselection.asp

Grapg 4 shows that before 23% export tax was implemented, the domestic sunoil price was significantly higher than world price. Since implementation of the export tax, domestic sunoil prices have fluctuated in line with world market prices. Some imports occurred in 1998/99, but Ukraine was a net exporter over the entire period in question (see Table 2).

Graph 4
Ukrainian Sunoil Production and Price Development



Source: UkrAgroConsult

The total oilseed crushing capacity in Ukraine is currently estimated at 3.9 MMT. Sunseed is processed by more than 200 enterprises in Ukraine, but 19 large sunseed processors united in the Association of Ukrainian Sunflower Seed Crushers UkrOliyaProm account for 85% of total vegetable oil production. The remaining 15% is produced by small-scale processing enterprises with low capacities and outputs.

Although crushing costs in Ukraine were very high in international comparison in the 1990s (see above), they have since fallen. For 2001/02, the FAO reports average costs of 20-40 US$/t, which is approaching Western European levels of efficiency. Of course, if (at least some and particular the largest) crushers have became cost-competitive, the rationale for the export tax becomes questionable. In this case the tax simply provides efficient domestic crushers with windfall profits, in economic terms 'rents'.

A by-product of sunoil production is sunflower meal (sunmeal), a livestock feed. Production of sunmeal has also increased over the years (Table 3). The protein content of sunmeal is 35-37%, but sunmeal is not considered as good a source of protein for livestock as, for example, soymeal. The development of the poultry meat industry in Ukraine may lead to an increase of demand for sunflower meal in Ukraine.

Table 3
Sunmeal Balances in Ukraine

Sunflower Meal (1000 MT)	*1998/ 1999*	*1999/ 2000*	*2000/ 2001*	*2001/ 2002*	*2002/ 2003*	*2003/ 2004*
Crush	1300	2100	2330	2070	2800	3200
Beginning Stocks	0	0	2	2	2	4
Production	520	850	950	820	1150	1300
Total Supply	520	850	952	822	1152	1304
Exports	190	338	600	597	848	950
Feed use	330	510	350	223	300	350
Total Domestic Consumption	330	510	350	223	300	350

Source: PS&D, www.fas.usda.gov/psd/psdselection.asp

3 Economic Justifications for Export Taxation?

The aim of this chapter is to scrutinise the plausibility of several arguments in favour of the oilseed export tax. We first consider the so-called infant industry argument, whereby the Ukrainian crushing industry needs temporary protection and help so that it can build up and become competitive, which was the primary objective of introducing the export tax (FAO, 2002). We then analyse the possible situation that Ukraine has market power in the world market for sunseed, which opens the possibility of an optimal export tax discussion.

A last argument should not go unmentioned. Some advocates of the export tax claim that many regions in Ukraine already produce too much sunseed from an agronomic perspective, which has detrimental effects on soil fertility and long-term productivity. According to this argument, the tax may hurt farmers, but it is for their own good. Aside from the fact that this is a rather paternalistic argument, it certainly does not justify taxing all sunseed farmers in the country, regardless of their crop management skills. Furthermore, policy makers should ask themselves whether the excessive production of sunseed is not due to excessive direct and indirect taxation of other crops, which forces farmers to (over)produce the only crop that is a reasonably dependable and intervention-free source of cash revenues.

3.1 The infant-industry argument

The so-called infant industry argument claims that an industry needs certain duration of public support in order to become internationally competitive. It has been used to justify industrial protectionism in the 19th century in the USA and Germany, and more recently import-substitution policies in developing countries. The subsidisation of the European aircraft industry (Airbus) is another example of subsidisation which is designed to help an industry to emerge and become competitive. The protection of sugar industry in Ukraine may serve a striking domestic example of helping infant industry to grow up. The core of the infant industry argument is that a domestic industry cannot become competitive because its costs are too high initially, even though they could be lower and competitive in the long run. This may be due to economies of scale or other barriers to market entry (e.g. know-how or monopoly power of competitors). Potential competitiveness is seen as justifying initial protection of the domestic industry to help it 'over the hump' until it can withstand competition on its own. The initial protection may lead to welfare losses in the short run, but it is assumed that these are outweighed by the long run benefits generated by the competitive industry later on.

In our context the sunseed crushing industry is the 'infant', and support is provided in the form of low-priced raw materials (sunseed) due to the 17% export tax on oilseeds. Oilseed crushers in Ukraine were inefficient and operating under capacity in the 1990s, while huge amounts of sunseed were exported to be crushed abroad. Under these circumstances, the justification for an export tax sounds compelling: the state supports a struggling industry, helps to maintain jobs and keep value added in Ukraine, and attracts FDI, and all this at virtually no cost to the national economy.

While these arguments do sound compelling, the following points should not be overlooked:

- First, the oilseed export tax does create very high costs in the form of significantly reduced revenues for domestic sunseed producers. Given a world price of 250 US$/t, the 17% export tax on oilseeds means that producers get 42.5 US$/t less than they otherwise would. Sunseed production averaged 3.05 mill. tons between 1998 and 2004 (table 1), so a simple 'back of the envelope' calculation shows that total annual losses to sunseed producers due to the tax amount to roughly USD 130m or UAH 700m (see the detailed simulation results in section 4). Policy makers in Ukraine constantly stress that they are committed to supporting farmers, but the oilseed export tax tells a very different story.
- Second, it was pointed out above that as early as 2001/02, domestic crushing costs had fallen considerably compared with the mid-1990s. As investment has continued, the current competitiveness of the crushing industry in Ukraine will be even stronger. The 'infant' has grown up and should stand on its own feet now. Hence, if there ever was a justification for infant industry support, that justification is no longer valid.

Indeed, the fact that the oilseed export tax continues to be applied is a classic example of what economists call 'rent-seeking'. Firms that receive infant industry support get accustomed to this support and work to maintain it long after they stop needing it. The irony of the situation is that the support that they receive – the so-called rents – are a very convenient source of money that can be used to legally – and perhaps even illegally – persuade policy makers to maintain the flow of support. This is perhaps the most important reason why many economists are so sceptical of the infant industry argument; even in cases where it does seem economically plausible, it is likely that it will be misused. Hudson and Ethridge (1998) analyse a typical policy setting in Pakistan, where an export tax on cotton was in force from 1988 to 1995 to support the 'infant' yarn industry through cheap inputs. The authors identify a substantial negative effect on the many cotton producers, find no significant expansion of yarn production, indicating that the infant industry protection with the aim of capturing more value added and increasing foreign exchange earnings has not worked. The authors explain this by the inelastic response of yarn mills to domestic cotton prices in the short run, and concede that a long-run investigation would probably have resulted in more pronounced expansion of the processed good. For Ukraine, by contrast, it seems that production capacities for sunoil have been substantially expanded during the last five years, leading again to bottlenecks in the supply of domestically produced raw materials. As soon as domestic surpluses will cease to exist on a regular basis, part of the rents received by crushers will be eaten up by price increases following an autarky situation when world market prices will lose their function as an upper price bound and, consequently, the export tax will become irrelevant. This is the background against which the recent demands for sunseed production subsidies by crusher associations can be explained.

3.2 The market-power argument

Initially, the infant industry argument served as the prime justification for introducing an export tax. But recently, suggestions for 'appropriate' export tax rates have entered the discussion (see Fry 2004). According to optimal tax theory (e.g., Corden, 1997), net welfare gains for an economy can be realised if a country is large enough to influence world market prices by imposing import or export tariffs.

Import tariffs tax the consumer to the benefit of producers and the budget, and export taxes burden producers and benefit consumers and the budget. What both have in common is that the losses outweigh the benefits, leading to a net welfare loss for the country as a whole. According to the optimal tariff theory, however, a country with a large share in world trade can increase its welfare by setting import or export taxes. When an importer imposes an import tariff, domestic prices will rise and domestic demand will fall. If the importer is large, the fact that it demands less from the world market will depress the world market price. The resulting reduction in the price of its imports can outweigh the welfare losses induced by the tariff, provided that the tariff is set at a rate equal to the inverse of the world supply elasticity. In the case of a large exporter, this mechanism works in the opposite direction, and overall welfare is

maximised at an export tax rate te (ad-valorem of the f.o.b. price) that is given by:

$$te = \frac{-1}{\eta^{w}} \cdot s_{EXP} \quad , \qquad (1)$$

where η^{w} is the price elasticity of world import demand, and s_{EXP} is the exporter's world market share.

Recent studies on export taxes have dealt with tax rate targeting, distributional effects of export taxes, and the consequences of strategic behaviour by trade competitors. WARR (1999) studies welfare effects by the example of Thailand's export tax on rice using a general equilibrium model of the Thai economy, stressing distributional effects in a sector which is characterized by a large share of subsistence production. The author concludes that an export tax harms the poor, both in rural and urban areas. It reduces both the consumer and producer prices of rice; but while poor households benefit from the reduction of the consumer price, the reduction of the producer price harms them, principally through its effects on the real wages of unskilled labor. In WARR (2002) the impact of the Philippine coconut export levy is examined. The export tax depresses unskilled wages and raises skilled wages throughout the economy, with the richest households benefiting most.

Regarding the choice of the optimal tax rate, WARR finds that tax rates and welfare effects are asymmetrically related, i.e. the welfare loss from overestimating the elasticity of demand for exports – resulting in an export tax too high – is smaller than the loss from a corresponding underestimation with a tax rate chosen too low according to optimal tariff theory. Taking into account the still volatile sunseed supply in Ukraine, this finding is fundamental when assessing the appropriateness of an optimal tariff policy from a welfare perspective.

To answer the question as to whether the current level of the export tax is at least theoretically appropriate, the pricing power Ukraine has on world markets has to calculated. Assuming that Ukraine had a near-monopoly in oilseeds, an optimal export tax would perhaps make sense provided that the farmers were partly compensated for their losses, e.g. by using the additional tax revenues. If Ukrainian market power is low, however, the welfare gains from an export tax are much lower as well, and might not justify any more the taxation of producers. One ingredient to market power is the world export market share of Ukraine s_{EXP}, which can be derived from trade statistics.

Moreover, the elasticity of world demand for sunseed has to be estimated. For this purpose, the World Agricultural Trade Simulation Model (WATSIM)[2] was used. WATSIM is a recursive-dynamic, partial equilibrium model on agricultural world trade, which covers 11 aggregate world regions. Ukraine is contained within a 'Rest-of-World' (ROW) aggregate, which also contains Russia, another large player on the sunflower seed market. The price flexibility of the world market regarding the excess supply of the ROW

[2] WATSIM was developed at the University of Bonn, Germany. See http://www.agp.uni-bonn.de/agpo/rsrch/watsim/wats_ov_e.htm

group has been simulated by carrying out a series of experiments, under which the supply from ROW was reduced, resulting in reduced net exports by up to 55 percent. The slope of a linear estimation function was estimated on the basis of these simulations. The results can be viewed in Table 4.

Table 4
World price response to reduced sunseed supply

Net exports by ROW (simulated), thsd. MT	2648	2361	2062	1761	1458	1155
World price (simulated), USD/MT	280	295	308	320	331	340
World price (estimated, linear form), USD/MT	285	296	307	318	330	341
World price (estimated, nonlinear form), USD/MT	280	288	299	312	328	349

Source: WATSIM simulations

The resulting slope coefficient was -.0375, which can be interpreted such that a 1000 MT increase of Ukrainian sunflower seed exports will cause the world market price to decrease by 3.75 US cents. As Ukraine currently has an export potential of around 1 million MT, world prices might rise by 37.5 USD/MT if Ukraine stops exporting at all.

Alternatively, one might consider estimating a constant elasticity function on the basis of rates of change of exports and prices. The result for this constant elasticity is -.2672, but with a fit substantially lower than the linear approach. Weighting this with the Ukrainian share within the ROW group (about 30.2 % on average between 1997 and 2002), one arrives at a constant world demand elasticity of -.0807 regarding Ukrainian net exports. When employing optimal export tax theory, the absolute value of this price flexibility (the inverse of a demand elasticity) would be the optimal export tax (8.07% ad valorem). This value is substantially lower than the current 17%, indicating that overall welfare gains are unlikely.

The magnitude of the optimal export tariff is determined by feeding both the linear and the non-linear elasticity into the Regionalised Agricultural Sector Model for Ukraine (RASMU). Under the linear formulation, changes in the world market price are made a function of changes in Ukrainian net exports

$$\Delta p_i^w = \Delta E_i^{UA} \cdot \eta_i^w \,, \qquad (2)$$

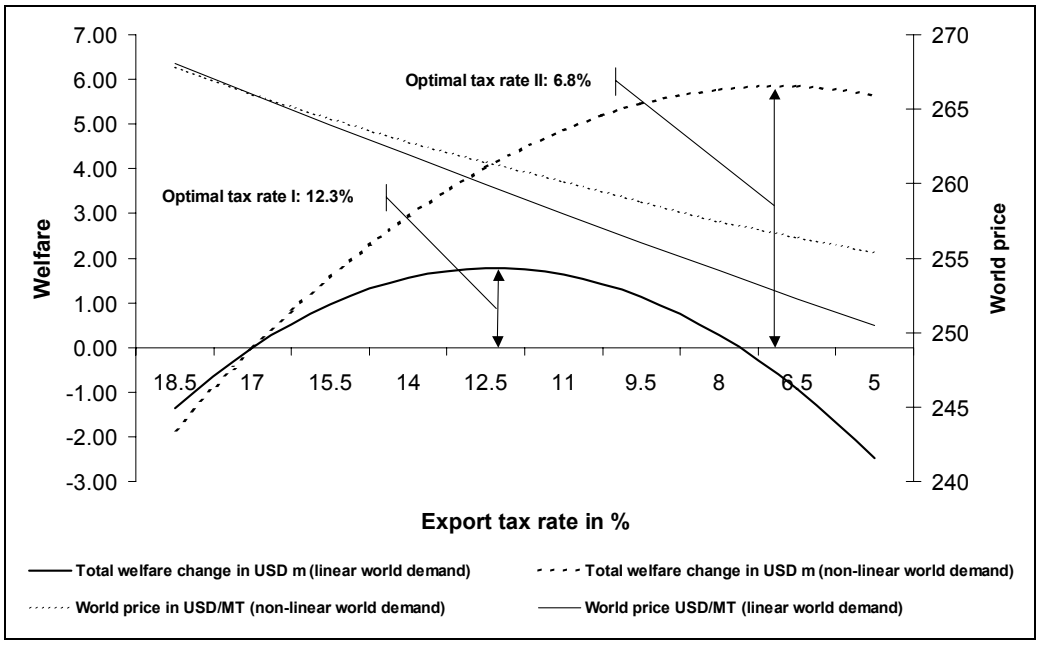
with p^w the world market price for good i, η^w the world import demand vis-à-vis Ukraine, and E^{UA} Ukrainian net exports. The world market reacts with price increases on the introduction of the export tax, which drive the model of optimal export taxation. As it is not straightforward to derive an optimal ad-valorem export tax from a linear demand equation analytically, a series of simulations that systematically modify the magnitude of the export tax are carried out. The optimal tariff level is to be found where the overall welfare of the economy is maximised. We then repeat the same experiment with a non-linear formulation of world demand

$$\frac{\left(p_i^w + \Delta p_i^w\right)}{p_i^w} = \left(\frac{\left(E_i^{UA} + \Delta E_i^{UA}\right)}{E_i^{UA}}\right)^{\eta_i^w}, \qquad (3)$$

Graph 2 summarises the results of these simulations. The results of the two simulation runs are very interesting for several reasons. First, they show the importance of the choice of functional forms for empirical estimations. The non-linear functional form tends to yield lower world market price responsiveness, and thus arrives at a lower optimal export tariff. The difference between the value of 12.3% for the linear and 6.8% for the non-linear approach is remarkable.

Graph 1

Total welfare changes for Ukraine (USD m) under alternative formulations of world demand for sunflower seed



Source: RASMU simulations

Second, it is surprising to find that the optimal export tax rate found in the non-linear simulations (0.068) is lower than the absolute value of the world price flexibility that characterises world demand (-0.0807), and thus seems to deviate from optimal tariff theory. A possible explanation might be that if price distortions can also be found in other sectors, their welfare impacts may interfere. Without further analysing this point, it shall only be mentioned that a simulation was carried out assuming Ukrainian world pricing power in sunflower *oil* being half of that in sunflower *seed* (i.e. -0.0404), ensuing an optimal export tax in sunflower *oil* in the magnitude of 4 % theoretically. When keeping the parameters for sunflower seed constant (world price reaction -0.0807, export tax 17%), and increasing the sunflower *oil* tax from zero by 2 percentage points in each iteration, an optimal export tax for sunflower oil of about 15% is the result! Part of the explanation for this is that the budget revenues from sunflower *seed*

exports increase, as less seed is demanded from crushers as a consequence from the tax burden. This is a welfare effect from an interlinked commodity market that shows that optimal tariff policy does not at all need to work according to expectations when applied to the real world. When abolishing the export tax on sunflower *seed* and assuming no market power in this commodity, variations of the sunflower *oil* export tax yield the theoretically demanded value. As there are also other price wedges apart from tariffs, such as transport or fobbing costs, it is well possible that also these have the potential to bias the welfare implications of an export tax for a single commodity.

Summing up the attempts to identify an optimal export tax for sunflower seed in Ukraine based on welfare criteria, one *may* conclude that the true value might be found somewhere between the linear and the nonlinear result, i.e. at around 9% ad-valorem. But taking into account the huge fluctuations in Ukrainian export supply, an economically reasonable targeting of the export tax seems hardly possible. The problem, as WARR (2001) demonstrates, is that the welfare losses that result from setting an 'optimal' tax too high by far outweigh the welfare gains that are realised when the tax is set too low. In other words, 'getting it right' on average is not good enough and will lead to net welfare losses. Since Ukraine's sunseed production fluctuates considerably and cannot be estimated with any accuracy until well after the harvest and exports have begun, determining a truly optimal export tax is next to impossible. Ukraine's sunseed export shares on the world market, s_{EXP}, according to FAO figures, averaged 16.6% between 1995 and 2002. Combined with a *hypothetical* price elasticity of *total* world import of -1.5, Ukraine's optimal export tax would equal 11.1%. However, the instability of Ukrainian sunseed yields caused s_{EXP} to range from 2.5% in 1995 to 25.7% in 1997. In the former year the optimal export tax would have been 1.7%, in the latter 17.1%. Obviously, a tax that is calculated using the average market share will be too low in years of large export surpluses, and too large in years of small export surpluses.

Even if we make the very heroic assumption that it is possible to obtain perfectly accurate forecasts of the other critical ingredients in equation (1), namely the elasticity of world import demand and the levels of competitors' exports,[3] attempts to apply an optimal export tax on Ukraine's sunseed exports will most likely lead to net welfare losses rather than gains, and the optimal export tax argument is not a convincing justification for Ukraine's current oilseed policy. This is especially true given that Ukraine appears destined to become a net importer of sunseed in the 2004/05 marketing year. In a net import situation, consideration of optimal export taxes is a purely academic exercise. The economic assessment of the tax carried out in the next section therefore abstains from the assumption of Ukrainian market power on the world's oilseed markets.

[3] Information on competitors' exports is required to calculate s_{EXP}.

4 Economic Assessment of the Export Tax

4.1 A simulation of policy options

Cutting or abolishing the oilseed export tax is currently being debated in agricultural policy circles in Ukraine. The Association of Ukrainian Sunflower Seed Crushers *UkrOliyaProm* has instead proposed the introduction of a production subsidy for farmers that would compensate them for the losses that they incur as a result of the export tax[4]. According to this proposal, crushers would continue to benefit from low priced sunseed due to the export tax, while production subsidies would ensure that farmers continue to produce enough sunseed to keep crushers operating at capacity[5]. As crushing capacities have grown in recent years (presumably due to the protection afforded by the export tax), ensuring sufficient supply of sunseed has become a concern. After all, if Ukraine had to become a net importer to satisfy capacities in the crushing industry, sunseed prices would jump considerably from FOB to CIF levels.

In this section we use an agricultural sector model (*RASMU*, Regional Agricultural sector Model for Ukraine, see KUHN, 2004) to assess the economic costs and benefits of these policy alternatives. The following scenarios have been simulated using *RASMU*:

- The base (status quo) scenario with the 17% export tax;
- Scenario I without the 17% export tax; and
- Scenario II with the 17% export tax and compensation of farmers with a production subsidy.

The simulation results are displayed in table 5. For reasons of the availability of regional statistical information, *RASMU* has been calibrated to reflect an average of the situations in the years 2001 and 2002.

When the export tax is abolished (*scenario I*), area and output of sunseed increase due to higher producer prices, while production of sunoil falls due to the reduction in the processing margin. As long as sunoil is exported, its domestic price remains tied to the world market price and, thus, unchanged. This is why consumers are not directly affected by the elimination of the export tax. As domestic processing of sunseed falls, exports of sunseed increase and exports of sunoil decrease. However, the latter remain significantly positive.

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4 See e.g. UKRAGROKONSULT, Agrinews No. 40 (2004)

5 Curiously, it would appear that the proponents of the oilseed export tax have forgotten their old argument that production of sunseed should be reduced for agronomic reasons!

If the export tax is maintained but farmers receive a production subsidy per tonne of sunseed (*scenario II*), sunseed area and output react more or less as in *scenario I*; eliminating the export tax or compensating for it have the same basic impact on farmers. The difference between *scenarios I* and *II*, of course, is that in the latter the crushing industry continues to benefit from artificially inexpensive sunseed, and there are no changes in sunoil production and exports, etc., compared with the *status quo*.

Table 5
Simulation results for the sunseed and sunoil sectors

	Base: 17% export tax	*Scenario I: No export tax*	*Change from I to Base (%)*	*Scenario II: 17% export tax plus prod. subsidy*	*Change from II to Base (%)*
Sunseed					
Area in 1000 ha	2613	3000	14.8	3015	15.4
Production in 1000 t	2961	3399	14.8	3416	15.4
Processing in 1000 t	2014	1536	-23.8	2014	0.0
Net trade (exports) in 1000 t	840	1772	111.0	1291	53.7
Producer price in US$/t [a]	192	235	22.6	237	23.6
Market price in US$/t	192	235	22.6	192	0.0
Producer surplus in mUS$		138		144	
Sunoil					
Production in 1000 t	951	725	-23.8	951	0.0
Dom. consumption in 1000 t	472	472	0.0	472	0.0
Net trade (exports) in 1000 t	479	253	-47.2	479	0.0
Producer margin in US$/t	155	63	-59.4	155	0.0
Domestic price in US$/t	468	468	0.0	468	0.0
Producer surplus in mUS$		-77		0	

[a] Including subsidy payments in scenario II.

Source: *RASMU* simulations.

Comparing the results of the two policy alternatives, one might conclude that *scenario II* is superior to *scenario I*, as it makes farmers better off while leaving crushers unaffected. However, so far our calculations have ignored the taxpayer, i.e. the rest of the national economy. In table 6 we see that budget expenditures increase in *scenario I* as export tax revenues are lost. But they increase much more in *scenario II* to cover the costs of the production subsidy. This increase more than compensates for increased export tax revenues in *scenario II* (due to increased sunseed exports). Altogether, eliminating the export tax produces an annual net welfare gain

of roughly 24 mUS$, with sunseed producers gaining 138 mUS$, crushers losing 77 mUS$ and taxpayers losing roughly 36 mUS$[6].

Table 6
Overall welfare changes compared to the base (million US$)

	Scenario I (abolishing the export tax) vs base	*Scenario II (17% export tax plus production subsidy for farmers) vs base*
Feed users	-9.89	-9.75
All producers and processors	70.22	156.22
Consumers	-10.05	-11.52
Taxpayers (budget)	-36.34	-134.85
Total national welfare	23.82	9.86
Northern regions	-5.76	-24.28
Western regions	-7.74	-26.49
Central regions	13.36	18.23
Southern regions	23.96	42.40

Source: *RASMU* simulations

In the final analysis, simply abolishing the export tax and paying a subsidy per tonne of sunseed directly to the crushers would have the same impact as maintaining the tax and paying a subsidy per tonne of sunseed to farmers. Of course, crushers have proposed the latter option and not the former, because a subsidy to crushers that is disguised as support to farmers is much easier to sell politically.

RASMU also offers a view on the regional distribution of welfare changes. Table 6 demonstrates that the Centre and South of Ukraine would gain most from either policy change. North and West – where neither sunflower seed nor oil is produced in major volumes – are hardly affected directly. However, the North and West lose indirectly when we consider the reduction in export tax income for the public purse on a per capita basis. However, losses in these regions are more pronounced if the production subsidy is introduced, as the budget cost of this subsidy must also be distributed on a per capita basis, and this amounts to more than the export tax revenues.

Note that these calculations do not consider the administrative costs of collecting taxes and paying subsidies, etc. The combined export tax/producer subsidy proposal made by *UkrOliyaProm* would involve the most administration and, hence, the highest costs of all the scenarios considered above, especially since the producer subsidy would have to be applied at the farm level which would involve a great deal of bureaucracy

[6] Introducing the compensating subsidy also leads to a welfare gain (almost 10 m US$ compared to the current situation). This is due to the fact that the distortion on the sunseed supply side is eliminated by compensation payments, while sunseed crushing remains distorted. In a sense, the compensation payments act as a sort of second-best correction of a small part of the distortions caused by the export tax.

(and presumable give the authorities yet another lever and excuse for interfering in farm management decisions)

4.2 Impact on international trade relations

As swift accession to the WTO is a broadly accepted policy goal in Ukraine, the question arises as to whether Ukraine's trade regime is broadly in line with WTO rules. Surprisingly, export taxes are not explicitly ruled out by the WTO, as the disciplines on this instrument are not clearly defined (OECD 2003; PIERMARTINI 2004). There are several explanations for this:

- Most industrialised countries have bilateral or regional agreements with each other which ban the use of export taxes. Therefore there has been no pressing need to take this issue before the WTO so far.
- Industrialised countries rarely have dominant positions on world markets for raw products that could be taxed in a reasonable way. Moreover, the farm lobbies in the OECD countries would not tolerate export taxes on agricultural commodities.
- Many developing countries rely to a considerable extent on export taxes applied to raw commodities such as cocoa, etc., because their fiscal systems are too weak to allow proper taxation of incomes or sales, etc. As developing countries are granted many exceptions under the WTO, there is no formal pressure on them to abandon their export taxes.

Hence, if Ukraine were a member of the WTO already, it would probably not encounter problems related to its oilseed export tax. However, matters are different for countries that apply for WTO membership. As pointed out in a report by the OECD (2003), Russia is currently under pressure to either schedule or eliminate export taxes on various raw materials. For example, in the framework of steel agreement under the Agreement on Partnership and Cooperation between EU and Russia, export on ferrous waste and scrap were prohibited. Similar disciplines were imposed on China as a precondition for WTO accession. Also some regional trade agreements have quite clear position regarding the export duty. For instance, EU, NAFTA, EU-Mexico, ANZCER, JSEPA, EFTA all prohibit export duties. In addition to the prohibition of export duties EU and Mexico declared that "Within the context of the multilateral negotiations, both Parties shall seek to establish disciplines for the elimination of export taxes or restrictions that operate to increase the exports of, or the protection afforded to, domestic industries, such as leather" (OECD, 2003). Thus, Ukraine's WTO accession would probably require a plan to phase out its export taxes.

5 Conclusions

In the five years that the oilseed export tax has been in force in Ukraine, significant investment into oilseed processing (crushing) capacities. In effect, farmers have paid for a considerable share of these investments, as they have received lower prices for their sunseed, leading to roughly 130 million US$/year in reduced revenues. Only the lucky coincidence of rising world market prices for sunseed has prevented this policy from turning into

a disaster. Nevertheless, the oilseed export tax is a tax on agricultural production and, as such, contradicts the repeated claims by policy makers in Ukraine that their top priority is helping farmers.

We therefore recommend that the oilseed export tax be phased out over a period of at very most three years. The crushing industry's proposal to maintain the export tax and subsidise sunseed producers is not a reasonable alternative. Indeed, it would actually represent a continuation of the current subsidy to crushers, disguised as support for farmers and paid for by taxpayers. Many crushers in Ukraine, especially the 'big players', have heavily invested in new capacities and more efficient technologies in recent years. They are internationally competitive and ideally located in one of the world's major sunseed production regions and close to important import markets. Hence, they should be able to stand on their own and should no longer receive support from farmers and/or taxpayers in Ukraine.

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