

Reduced VAT rates for flowers and plants

Bunte, Frank

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This paper evaluates the impact of the application of the lower VAT rate to ornamentals on turnover and employment in the ornamental supply chain. The lower VAT rate is applied to flowers and plants in thirteen EU member states. The impact is measured using a partial equilibrium model available at LEI. The model models demand and supply in European horticulture.

Orders:

Phone: 31.70.3358330

Fax: 31.70.3615624

E-mail: publicatie.lei@wur.nl

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Management summary

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Summary

This paper evaluates the impact of the application of the lower VAT rate to ornamentals on turnover and employment in the ornamental supply chain. The lower VAT rate is applied to flowers and plants in thirteen EU member states. The paper shows that the application of the lower VAT rate generates an employment of 32,500 FTE in ornamental production and nearly 35,000 number of persons in wholesale and retail trade.

Introduction

In 2008 the European Commission will evaluate the reduced tariffs in the 6th VAT Directive. Annex H of this directive contains a list of goods and services that may be taxed with a reduced rate. On the basis of directive 96/42 the reduced rate may be applied also to ornamentals (flowers, plants, bulbs, nursery stock).

	Lower tariff	General tariff	Price effect
	%	%	% Change
Austria	10.0	20.0	9.1
Belgium	6.0	21.0	14.2
Czech Republic	5.0	19.0	13.3
France	5.5	19.6	13.4
Germany	7.0	19.0	11.2
Greece	9.0	19.0	9.2
Ireland	13.5	21.0	6.6
Italy	10.0	20.0	9.1
Luxemburg	6.0	15.0	8.5
Netherlands	6.0	19.0	12.3
Poland	7.0	22.0	14.0
Portugal	12.0	21.0	8.0
Spain	7.0	16.0	8.4

Source: European Commission, DOC/2908/2002-EN.

On this moment the reduced rate for ornamentals is applied in 13 member states.¹

If the regular VAT-rate would be applied in the 13 member states mentioned in footnote 1, consumer prices would rise in these countries. As a result, consumption of ornamental products would fall causing a decrease in net turnover and employment in retail and wholesale trade and ornamental horticulture production.

This paper estimates the effects of a change in the VAT rate regime on net turnover and employment in retail, wholesale and production using a supply-and-demand model for ornamental horticulture products. The price elasticity for ornamentals are derived from a recent study by Bunte et al. (2007). The analysis applies to the ornamental supply chain only. We do not take into account the effects of a possible increase in the VAT rate in other sectors. Since VAT rates differ among European countries, the consumer price increases differ as well (table 1).

Ornamental production and trade in Europe

Ornamental horticulture production and trade constitutes an important supply chain generating employment for 300,000 full time equivalents in ornamental production in the EU25² and 350,000 persons employed in European wholesale and retail trade in flowers and plants. Turnover in the European Union amounts to 18 billion euro in production, 28 billion in wholesale trade and 37 billion euro in retail trade. The Netherlands are the largest producer by far, but one should not neglect domestic production in France, Germany, Italy and Spain. Dutch production is specialised in cut flowers and flower bulbs, but still sizable in pot plants and nursery stock. Italian and Spanish production is specialised in cut flowers and to a lesser extent pot plants. French production is sizable in all product categories, but specialised in nursery stock.

Table 2	Turnover in ornamental horticulture in the EU25 (2005, million euro)		
	Production	Wholesale	Retail
Austria	250	525	825
Belgium	550	775	1,225
Czech Republic	50	100	175
France	1,775	3,325	5,250
Germany	2,740	5,425	8,500

¹ Germany, Netherlands, Belgium, Luxemburg, Ireland, France, Spain, Portugal, Italy, Greece, Austria, Poland and the Czech Republic.

² The analysis in this report is based on 2005 data. For this reason, Bulgaria and Romania are not included as yet.

Table 2	Turnover in ornamental horticulture in the EU25 (2005, million euro) (continued)		
	Production	Wholesale	Retail
Greece	150	250	400
Ireland	125	250	375
Italy	2,675	3,575	5,700
Luxemburg	5	25	40
Netherlands	4,800	6,075	2,250
Poland	150	215	350
Portugal	475	675	1,075
Spain	2,275	3,100	4,875
Rest of the EU25	2,150	4,100	6,425
Total	18,170	28,415	37,465

Table 3	Employment in ornamental horticulture in the EU25 (2005)		
	Production	Wholesale	Retail
	FTE	Number of people employed	Number of people employed
Austria	3,275	900	7,100
Belgium	6,600	700	4,150
Czech Republic	2,050	525	2,750
France	37,000	5,400	20,800
Germany	44,100	8,850	61,150
Greece	2,100	1,050	3,775
Ireland	1,425	350	2,700
Italy	40,875	8,700	37,725
Luxemburg	50	15	200
Netherlands	43,500	18,750	29,750
Poland	5,350	1,050	6,775
Portugal	14,125	3,000	12,575
Spain	65,625	9,125	42,950
Rest of the EU25	31,050	7,500	48,850
Total	297,125	65,915	281,250

Method

The effects of the VAT increases are estimated using a supply and demand model for ornamental products. The model assumes that the subsequent stages in the production and distribution chain are competitive. This assumption is valid given the number and the scale of the firms operating in the chain. As a result, two assumptions can be made: constant returns to scale in production and a zero-profit condition. Both assumptions imply that the increase in the VAT rate is completely transmitted into higher consumer prices. Bunte and Kuiper (2008) indeed find that a one percent increase of the producer price also leads to a one percent increase of the consumer price. Based on this result we conclude that pricing in ornamentals retail is competitive and that VAT rate changes may be expected to be transmitted perfectly. The incidence of the tax burden lies with consumers. The effects on sales and employment in the other stages of the production and distribution chain follow from the decrease in consumer demand. The employment results are estimated using productivity indicators for the respective stages in the chain, more in particular turnover per full time equivalent (fte) for ornamental production and turnover per person employed for wholesale and retail trade. For the production sector, estimates from the FADN-database have been used. For the wholesale and retail sector, estimates based on Eurostat data have been used.

Price elasticities

The effect of a price increase on consumption is measured by the price-elasticity of demand. Bunte et al. (2007) find price-elasticities for the Netherlands: -1.1 for cut flowers and pot plants and -1.5 for outdoor plants. The price elasticity of demand may also be derived from the temporary increase in the French VAT rate for ornamental products in 1991. The VAT rate increase from 5.5 to 18.6% coincided with a drop in net retail sales of 12,6% implying a price elasticity of -1.0. Though consumer expenditure on ornamentals remained more or less constant, the tax-rate increase implied a substantial fall in net sales.

A price elasticity between -1 and 0 (in absolute value) implies that the quantity consumed decreases as the price rises, but that the amount spent on the product (including VAT) increases. Products with a price elasticity of demand between -1 and 0 are referred to as necessary goods. The demand for necessary goods are rather invariable to price changes in contrast to the demand for luxury goods, i.e. goods with a price elasticity below -1 (and exceeding 1 in absolute value). Examples of necessary goods are food products such as bread, potatoes and pasta, and repair services. Examples of luxury goods are consumption in restaurants and airline tickets. One can not do without necessary

food items. For this reason, the price elasticity of demand for necessary goods such as potatoes somewhere between -1 and 0, but typically close to 0. For labour intensive services, CPB (2003) concludes that application of the lower VAT rate from 2000 onwards has led to a significant decrease in consumer prices and that this decrease has had a profound effect on both retail turnover and employment. For luxury goods such as airline tickets, the price elasticity of demand typically is below -1 (and above 1 in absolute value): demand reacts sharply, i.e. more than proportionally. The price elasticities of demand for indoor and outdoor ornamentals found for the Netherlands indicate that people consider flowers and plants to be luxury items, the demand for which is price sensitive. The price elasticities used in earlier studies (Bunte and Van Galen 2003) may be considered to be conservative assumptions.

Results

This section presents the effects for the thirteen countries as well as the other EU countries. The VAT-rate increases lead to a fall in turnover throughout the supply chain: a fall of 3,985 million euro in European retail trade, a fall of 2,830 million euro in European wholesale trade and a fall of 1,860 million euro in European ornamental production (table 4). This fall leads to a decline in employment throughout the European horticultural chain: 32,425 FTE in European ornamental production, 6,390 persons employed in European wholesale trade and 28,920 persons employed in European retail trade (table 5). Because producer prices decline a little due to the fall in demand, consumer demand is stimulated in the countries already applying the regular VAT tariff (see Table 4 and 5). Production of ornamentals in the other 12 countries falls. This hold especially for Denmark (-165 FTE).

	Table 4 Impact of a VAT rate increase on turnover in ornamental horticulture in the EU25					
	Production		Wholesale		Retail	
	Mln euro	%	Mln euro	%	Mln euro	%
Austria	-30	-11.1	-60	-11.0	-90	-11.0
Belgium	-80	-15.0	-110	-18.7	-170	-18.7
Czech Republic	-10	-16.5	-20	-17.1	-30	-17.1
France	-310	-17.6	-580	-17.3	-910	-17.3
Germany	-375	-13.7	-750	-13.9	-1,175	-13.9
Greece	-20	-10.6	-30	-10.8	-40	-10.7
Ireland	-10	-7.1	-20	-9.0	-30	-8.8
Italy	-290	-10.8	-390	-11.0	-630	-11.0

Table 4						
Impact of a VAT rate increase on turnover in ornamental horticulture in the EU25 (continued)						
	Production		Wholesale		Retail	
Luxemburg	-0.5	-5.9	-2.5	-9.4	-4.0	-9.6
Netherlands	-375	-7.8	-390	-6.4	-160	-14.7
Poland	-20	-12.5	-40	-18.7	-65	-18.9
Portugal	-50	-11.8	-80	-11.6	-120	-11.6
Spain	-270	-11.9	-370	-11.9	-580	-11.9
Rest of the EU25	-20	-0.9	10	0.2	15	0.2
Total	-1,860	-10,3	-2,830	-10,1	-3,985	-10,8

Table 5						
Impact of a VAT rate increase on employment in ornamental horticulture in the EU25						
	Production		Wholesale		Retail	
	FTE	%	Number persons	%	Number persons	%
Austria	-360	-10.9	-100	-11.0	-780	-11.0
Belgium	-950	-15.0	-125	-18.7	-740	-18.7
Czech Republic	-330	-15.8	-90	-17.1	-470	-17.1
France	-6,670	-18.0	-930	-17.3	-3,590	-17.3
Germany	-6,100	-13.9	-1,225	-13.9	-8,500	-13.9
Greece	-220	-10.5	-110	-10.8	-400	-10.7
Ireland	-100	-7.1	-30	-9.0	-240	-8.8
Italy	-4,210	-10.3	-960	-11.0	-4,160	-11.0
Luxemburg	-5	-5.7	-5	-9.4	-20	-9.6
Netherlands	-3,400	-7,8	-1,200	-6,4	-2,310	-14,7
Poland	-675	-12,6	-200	-18,9	-1,250	-18,6
Portugal	-1,590	-11,2	-350	-11,6	-1,460	-11,6
Spain	-7,600	-11,6	-1,080	-11,9	-5,100	-11,9
Rest of the EU25	-215	-0,7	15	0,2	100	0,2
Total	-32,425	-10,9	-6,390	-9,8	-28,920	-10,4

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