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THE HIGH COST OF EATING: AGRICULTURAL PROTECTION AND INTERNATIONAL DIFFERENCES IN CONSUMER FOOD PRICES

Robert E. Lipsey
Birgitta Swedenborg

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ABSTRACT

Prices of food vary greatly among the developed countries, and some countries' food prices have been consistently far above the OECD average. The main explanation for persistently high food price levels is the extent of protection of agricultural products at the farm level, partly explainable by the desire to retain agriculture in the face of poor growing conditions. A second important influence for some countries is a high level of VAT on food. A third is deviations of aggregate country price levels from the levels that would be predicted from their per capita incomes, presumably because of omitted characteristics of the countries' economies, such as, possibly, inefficient or monopolistic service sectors. In addition, there are occasional episodes of high price levels due to temporary factors affecting exchange rates.

The issues raised by these large food price differences are relevant to understanding real income differences among countries. They are also relevant to the current round of GATT negotiations, in which agricultural protection is a frequent stumbling block, and to the European Community's hopes of increasing competitive pressures through the creation of a freer internal market.

Robert E. Lipsey
Queens College and the Graduate Center
CUNY and
Flushing, N.Y. 11367
and NBER

Birgitta Swedenborg
Studieförbundet Näringsliv
och Samhälle (SNS)
Sköldungagatan 2
Box 5629
S-114 86 Stockholm
SWEDEN

The High Cost of Eating: Agricultural Protection and International Differences in Consumer Food Prices

Robert E. Lipsey
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Introduction

Although farm products are tradable goods, and a substantial part of the world's trade, prices of food to consumers vary widely across countries. Even among the more developed OECD countries, other than Greece, Portugal, and Turkey, the highest food price level in 1990, for Finland was more than twice the lowest, for New Zealand, and 60 per cent above the average for the EC countries. Moreover, these price disparities have persisted over long periods.

Our interest in this topic was stimulated by the observation that food prices have been persistently high in absolute terms in Sweden and the other Nordic countries, and also high relative to the usually high general price levels of these countries. Several possible explanations come to mind. One is that these are relatively high income countries, and price levels in general have been shown to be positively correlated with income levels (Kravis and Lipsey, 1983 and 1987, and the reports on the several stages of the UN International Comparison Program cited there). Another is that the climate for agricultural activity is relatively poor in these countries, and the levels of protection required to protect domestic agriculture in countries that do not have a comparative advantage in agriculture may be high. A third is that rates of taxation, and particularly taxes on food, could be higher than in other countries. And a fourth is that food at the retail level may include a large service component and services may be high in price in these countries, either because of their high income levels (Kravis and Lipsey,

1983; Bhagwati, 1984) or for other reasons, e.g., lack of competition in protected markets.

Surprisingly little is known empirically about what accounts for wide and persistent price disparities between countries. Such price differences call into question the empirical validity of the idea of purchasing power parity. They raise issues that are important to an understanding of real income differences between countries and are also relevant to evaluations of policy. To the extent that high prices are the result of, e.g., import protection and weak domestic competition, they may represent a largely hidden cost of anti-competitive policies.

In this paper we explore the determinants of food price levels among the OECD countries, using as a basis the international price data collected as part of the UN International Comparison program (ICP). We have confined our attention to the OECD countries so as to have a group of fairly similar economies. In particular, we wanted to avoid the problems in food price measurement associated with large subsistence agriculture sectors. We have relied mainly on the food price data prepared by the OECD from the basic data collected as part of the ICP.

The issues raised by international food price differences are relevant both to the current round of GATT negotiations, where agricultural protectionism is a constant stumbling block, and to the European Community's ambition to increase competitive pressure through the creation of a freer internal market. They are certainly relevant to an understanding of real income differences between countries.

Price Level Data

There are two systematically organized sources of data on price levels.

Both are derived from the UN's International Comparison Program, which is a large-scale international effort to develop a set of measures of the real incomes of many countries.[1] The program had its origins in an OEEC effort in the early 1950s to make real income estimates for a few European countries and the U.S. It has since become a large international program encompassing something like 80 countries worldwide. The major data collection involved is the pricing of identical commodities in many different countries and is carried out by the Statistical Offices of each of the countries, coordinated by the EC, the OECD, and the Statistical Office of the United Nations.

This price collection produces relative price indexes for benchmark years, at 5-year intervals, for some 130 commodity and service subgroups. In addition, the EC has collected and published international price comparisons for a much more extensive list of products for the ICP benchmark years and for intervening years.

Of the two versions of these data available, one is based on the data for all countries, and uses the worldwide weights for each product. It is published by the United Nations and is the basis for the country estimates by Summers and Heston (1991) covering almost all countries and dates since the 1950s. The second set of calculations, based on the same original data, is performed by the OECD using EC weights for EC countries and OECD weights for other countries. We have used the OECD data here partly because both the set of countries and the weights are more homogeneous than in the worldwide data, and partly because the OECD data provide annual comparisons at a finer level of detail than in any version based on the UN compilation.

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[1]For some of the history of the enterprise and references to earlier reports, see Kravis (1984) and Kravis and Lipsey (1991).

The Aggregate Price Level

Although our main interest here is in the factors determining food price levels, we begin with an analysis of general, or GDP, price levels, on the theory that some of the variance in food prices may reflect these broader influences. We think of the factors determining the general price level as falling into two classes: what we call structural, or long-term influences, and short-term ones. Structural factors are those that change only slowly, such as the country's per capita income, its level of taxation, the resource base, the share of services in output, and the country's openness to trade, or level of protection of domestic production. Short-term factors might be fluctuations in exchange rates, or in monetary or fiscal policy. In this paper we have examined only the long-term influence on the general price level; the short-term influences, to the extent they are disentangled from the structural ones, appear mainly as changes in the price level residuals for individual countries.

The GDP price levels for the OECD countries in 1979-1990, by three-year periods (listed in Appendix Table 1), show that prices were high in every period in seven countries: Denmark, Finland, Iceland, Japan, Norway, Sweden, and Switzerland. Over the period as a whole, Norway's price level was the highest, on average, as can be seen in Table 1. This price level was substantially above those of Iceland and Sweden, the next two, which were followed by Denmark, Finland, Switzerland, and Japan. Thus high price levels have been associated with Nordic countries consistently through the 1980s. The same group, except for Japan, were high-priced countries in the 1970s as well, with Sweden, Denmark, and Norway having the three highest price levels in the OECD.

Table 1

GDP Price Levels of Seven High-Price OECD Countries
Average of Four Periods, 1969-1978 and 1979-1990
(OECD Average = 100)

	1969-78	1979-90
Denmark	133	119
Finland	114	120
Iceland	123	126
Japan	103	116
Norway	127	136
Sweden	142	123
Switzerland	113	121

Source: Appendix Table 1 and corresponding data for the earlier period from the same sources.

Another group of countries, mainly, but not entirely, the lower-income ones, always had low overall price levels.

Some short-term effects are also visible in the price levels, including that of the high U.S. dollar in 1982-84 and the Swedish devaluations in the early 1980s.

Almost all analyses of differences in general price levels (Kravis and Lipsey, 1983 and 1987; Bergstrand, 1991, Clague, 1985, 1986) have concluded that price levels are positively correlated with per capita real income across countries. Of many other variables that have been suggested, such as the share of tradables in total output or the degree of openness of the economy, none has revealed as consistent a relationship. We have, therefore, begun with per capita income in analyzing price levels. We have added two other policy variables, each of which takes several alternative forms. One is the indirect tax burden, on the assumption that these taxes - mainly VAT - are passed on to domestic consumers but not to foreign consumers, and are therefore not simply offset by exchange rate changes. The second is the

degree of protection given to domestic agriculture, on the assumption that any one country's protection affects domestic prices but not, to any large extent, world prices. Ideally we would have preferred a measure of each country's overall degree of protection, of which agricultural protection is only a part.

In addition to these policy variables we would have wished to include at least two other characteristics of the countries. One is the degree of competition in the domestic wholesale and retail sectors and the other is the dispersion of wages across skill levels or industries. The basis for the competition variable is obvious. The basis for the wage dispersion variable is that retailing, especially food retailing, is a relatively low-skill industry, and an industry that can make use of part-time workers, mothers who wish to work only during school hours, or students who wish to work only outside school hours. In a country in which skill differentials are high, or employers offering convenient hours can pay low wages, retailing should enjoy low labor costs. Where wage differentials are small, as in the Scandinavian countries, the retailing industry would gain little by employing low-skill or part-time workers. Therefore, the higher the degree of wage dispersion or wage differentiation in the economy, the lower retail margins, and therefore retail prices should be.

Unfortunately, we were not able to find any cross-country data on competition in the distribution industry, as a whole, or in food distribution. The wage dispersion data were poor and not available for many countries. We therefore can report some experiments with that variable but cannot incorporate it into the main results.

We experimented with two variants of the taxation variable. One is the reported standard rate of VAT or corresponding sales taxes. The second is the

overall ratio, for all levels of government combined, of indirect taxes on goods and services to GDP. We have some preference for the last measure because it is consistent across countries, to the extent that the OECD can achieve such consistency. It covers provincial and state, as well as local governments. The standard VAT rate, on the other hand, covers different proportions of national output in different countries, because there are different treatments of food, production inputs, services, and "luxury" goods in the various national tax regimes.

Two measures of agricultural protection are available, the net producer subsidy equivalent (NPSE) and the consumer subsidy equivalent, or CSE. The PSE is a measure of the protective devices used by governments to raise domestic farm prices. The gross PSE is the difference between domestic and world prices, to which the net PSE adds explicit subsidies to farmers and subtracts "excess" input costs, such as inflated costs of feed. The CSE is a measure of the subsidy to consumers in which the PSE, a negative subsidy for consumers, is offset to some, usually small, degree by measures that reduce the prices paid by consumers. Also, the CSE is calculated on the basis of quantities consumed rather than quantities produced in each country. The PSE should be positively related to general price levels and the CSEs negatively related. The gross and net PSEs and the CSEs for three-year periods are shown in Appendix Table 11.

We have fitted the equations for the general price level to three-year averages of the dependent and independent variables to reduce the effects of transient disturbances on the coefficients. The indirect tax measure we prefer, indirect tax receipts at all levels of government combined as a per cent of GDP, is used in Table 2.

Table 2

Equations Relating GDP Price Levels to Per Capita GDP,[a] Indirect Taxes,[b] and Net PSE[c]

	No. of Obs.	Constant Term	Coefficients RGDPC[a]	INDT[b]	NPSE[c]	$\bar{R}^2$
1979-81	22	9.54	.533	2.76	.520	.636
		(.61)	(4.24)	(3.53)	(2.72)	
1982-84	22	4.90	.598	1.57	.452	.522
		(.26)	(4.18)	(1.78)	(2.08)	
1985-87	22	-2.01	.591	1.15	.619	.682
		(.13)	(5.04)	(1.61)	(3.65)	
1988-90	22	9.14	.553	1.38	.605	.585
		(.44)	(3.65)	(1.46)	(3.52)	

Figures in parentheses are absolute values of t statistics.

[a]Real per capita GDP, with OECD average equal to 100

[b]Indirect taxes on goods and services as a percentage of GDP

[c]Net market support payments as a percentage of market value of products.

More than half the variance across countries in GDP price levels is explained by these equations in every period. The coefficients for GDP per capita and the protection measure are always statistically significant. The per capita income coefficient is the most uniform over time, but the net PSE coefficient also varies over a range of only about 50 per cent (highest as per cent of lowest). The protection coefficient is surprisingly high, considering that the PSE applies only to agricultural products that form a fairly small part of final consumption. The size of the coefficient suggests that it may be a proxy for a much wider range of import protection and, perhaps, internal barriers to competition.

Another possibility is that we should not be treating the protection level as endogenous, because it is itself dependent on the price level. If, for example, each country wished to maintain five per cent of its population in agriculture, regardless of cost, the required level of protection would depend on the country's climate and its general price and cost level. If the country wished to not only maintain the numbers in agriculture but also provide an average level of income to farmers, the required level of protection would also reflect the country's per capita income. Some possible implications of this picture of the world are discussed below.

The coefficient for the indirect tax rate varies widely, declines in size over time and is significant only in the earlier years. It is always a positive influence on price levels.

A more disturbing feature of the indirect tax rate coefficients is that they seem too high; it is difficult to see why they should not be close to 1.0, as they would be if they were added on to all internal prices, but had no offsetting effects on export prices or exchange rates [PL = Pretax PL x

(1 + INDT)]. The high levels point to a relation to some missing influence on prices that is correlated with indirect tax levels.

If we represent the tax level by the standard VAT rate, instead of total indirect taxes, the equations explain price levels a little less well than those of Table 2, except in the last period, and the coefficients of the other variables are similar to those in Table 2. Again, only the per capita income and rate of protection coefficients are consistently significant. The coefficients for the VAT rate are almost always below one, as expected, but fluctuate over a wide range and are not statistically significant after the first few periods. These equations are not shown here.

For a few of the later periods we have data on average CSEs for all products, a measure theoretically preferable to the net PSEs used in Table 2 because it includes subsidies to consumers that lower the prices they pay for food. However, the results are not superior to those using the net PSE. Since the CSE measures are available only after 1986, we rely here on the results of the earlier equations.

A last experiment arose from our concern that the high coefficients for the VAT rates and the indirect tax rate were really reflecting other factors that were correlated with VAT rates. As an alternative, we assumed that the VATs were passed on directly to consumers and that we could therefore remove their true effect on prices by dividing each country's price level by 1 + % VAT, where % VAT is the ratio of the VAT payment to the value net of VAT. In effect we are assuming that the coefficients for the VAT rate in the equations should be set at one.

The results of these calculations are shown in Table 3. The degree of explanation of the price level net of VAT is quite high, considering that we

Table 3

Equations Relating GDP Price Levels[a]
Net of Standard VAT[b] to Per Capita Income[a] and Net PSE

Period	No. of Obs.	Constant	Coefficients RGDPC[a]	Coefficients NPSE	$\bar{R}^2$
1979-81	21	19.04 (1.22)	.501 (3.53)	.701 (3.41)	.532
1982-84	22	5.87 (.38)	.554 (3.78)	.581 (2.54)	.517
1985-87	22	-11.57 (.10)	.585 (5.62)	.757 (4.81)	.750
1988-90	22	5.24 (.40)	.556 (4.42)	.661 (4.22)	.668

[a]OECD average = 100

[b]Price level ÷ $(1 + \frac{\text{SVAT}}{\text{Market Value}})$

have discarded a variable that was often statistically significant. In the last five periods, the degree of explanation is higher than for the equations based on total indirect taxes. The coefficients of the remaining variables, per capita income and protection, were consistently significant, not very different in size from those in the other sets of equations, and more consistent from period to period.

Our confidence in these price level equations would be higher if their predicted price levels for particular countries or groups of countries were similar from one equation to another. That would imply that the country residuals from all types of equations were similar. The residuals for the high-price countries, Japan, Switzerland, and the Nordic countries, are shown in Table 4 for the central years of four periods.

On the whole, the results are encouraging. The residuals are smaller than the deviations from OECD averages in Appendix Table 1 and are highly correlated among the three equations. The very large Japanese price level residuals in the last two periods were not substantially affected by alterations in the equations used. None of our equations fits Japan well in the later 1980's. Presumably the high price level reflects other influences that drove up the exchange value of the Yen relative to its purchasing power parity after 1985. Norway had high residuals in the early 1980s, whatever the equation used. In that case the high price level may have reflected the effects of oil discoveries and the investment in oil production that followed. The low residuals for Sweden in the mid-1980s reflect the large devaluation of the Krona in that period.

On the whole, we find that we can explain most of country differences in GDP price levels within the OECD quite well. The main influence, as has been

Table 4

Residuals for Six Countries from Various GDP Price Level Equations

1. Dependent Variable: PL; Independent Variables: RGDPC, INDT, NPSE

	1979-81	1982-84	1985-87	1988-90
Japan	2.04	7.55	23.87	21.64
Switzerland	-4.09	-5.02	-4.87	-6.32
Denmark	3.76	-.61	3.59	9.84
Finland	-5.65	-2.84	5.51	11.09
Norway	10.04	16.37	-3.30	1.72
Sweden	27.94	2.10	5.50	13.56

2. Dependent Variable: PL; Independent Variables: RGDPC, SVAT, NPSE

Japan	-2.38	2.71	25.35	23.90
Switzerland	-11.49	-10.11	-7.13	-6.27
Denmark	13.44	5.70	6.42	11.05
Finland	2.87	-.96	3.85	10.41
Norway	13.94	21.16	-.56	3.22
Sweden	19.14	.65	-.08	7.26

3. Dependent Variable: PLNV; Independent Variables: RGDPC, NPSE

Japan	-.99	7.74	22.94	20.98
Switzerland	-13.27	-9.20	-7.14	-.13
Denmark	14.52	1.44	7.38	14.53
Finland	.79	.62	2.37	12.16
Norway	11.18	18.01	2.32	4.59
Sweden	17.32	.35	-.99	9.23

PL - Price level for GDP
PLNV - Price level for GDP net of standard VAT
RGDPC - Real GDP per capita
INDT - Indirect taxes levied by all levels of government as per cent of nominal GDP
NPSE - Net producer subsidy equivalent
SVAT - Standard VAT rate

Source: Appendix Tables 5, 6, and 7.

found for broader ranges of countries, is real per capita income. To the extent that this relationship reflects the effect of per capita income on service prices, the same factor should affect food prices, because they include a substantial service content.

Aside from per capita income, indirect taxes also appeared to affect the price level, as we might expect since the price level is measured inclusive of indirect taxes. On the possibility that indirect taxes are passed through to consumers, we also estimated the determinants of price net of tax, in effect assuming that the coefficient for the standard VAT is one, instead of estimating it directly. The influence of per capita income was just as strong in this formulation.

The degree of protection of farm products was also consistently significant in equations for the general price level, to such an extent as to raise the question of whether it was a cause or an effect of these price levels.

Food Price Levels

The high-priced countries, by the standard of GDP price levels discussed earlier, were about 30 per cent more expensive than the OECD average in 1988-90. Since the GDP price level includes a large service component, usually thought of as the main source of price level differences among countries, the food price levels might be expected to vary less across countries. In fact, food price levels in the same seven countries were, on average, more than 50 per cent above the average of the OECD countries in that same period (Table 5). The seven countries with the highest GDP price levels were also the seven most expensive countries for eating. Since food consumption accounted for a small part of GDP, there must have been some common influences affecting food

Table 5

Food Price Levels of Seven High Price OECD Countries
Average of Four Periods, 1979-1990
OECD Average = 100

Denmark	124
Finland	144
Iceland	146
Japan	148
Norway	142
Sweden	142
Switzerland	138
EC 6	98

Source: Appendix Table 2

prices and other prices. The food price levels in the EC 6, despite the price-raising effects of the common agricultural policy (CAP), were just about average among the OECD countries.

In theory, CAP means that the EC countries have the same degree of agricultural protection. That should imply that agricultural prices at the producer level should be the same. In practice, however, the degree of protection varies also within the EC. However, the wide dispersion of consumer food prices within the EC countries (from Portugal's 73 to Denmark's 129) could not mainly reflect such differences in agricultural protection but must involve differences arising in the nontradable sector (wholesale and retail), including VAT.

Whatever the determinants of food price levels, one clear characteristic of the levels is their persistence. Of the 24 countries for which we have price level data, 15 were either always above average or always below; only nine switched positions at any time. The food price level must reflect very

permanent features of an economy or of its policies toward food industries.

Table 6 shows the results of an attempt to explain national food price levels by per capita incomes, food VATs, and the level of protection. The degree of explanation was considerably higher than for the GDP price level: from 75 to 80 per cent of the food price variance is explained by these variables. All the coefficients are statistically significant, with the expected signs. The coefficients for the food VAT range from .92 to 1.51, with two of them considerably above the 1.0 we would expect. The coefficient for the agricultural protection variable was also high, especially in the period after 1985, but in the earlier period also. A coefficient of one for the net PSE implies that a reduction of one percentage point in the rate of agricultural protection in the average OECD country would lead to a one per cent reduction in consumer food prices, far more than could be explained by multiplying the fall in agricultural prices by the share of agriculture in final food product prices. The further implication is that protecting the farmer also usually means protecting later stages in the links between farmer and consumers. A country that protects farmers by raising farm prices far above world levels must also protect its processed food industries; unless they are totally protected by transportation or spoilage costs, food industries in countries with high farm prices need some protection of their own. Otherwise imports of processed foods from countries with low farm prices would undercut local producers. Thus, a high PSE on farm products (often actually applied to semi-finished products), may bring with it high protection for food processing also. There are often, in addition, non-tariff barriers to trade in processed foods. This helps explain how segments of the food industry in Sweden, for example, can display costs that are twice as high as

Table 6

Equations Relating Food Price Level[a] to
Per Capita Income, Food VAT Rates, and Net PSE[b]
Four Periods, 1979-1990

Period	Number of Observations	CONSTANT	RGDPC	FVAT	NPSE	$\bar{R}^2$
1979-1981	21	46.16	0.24	1.43	0.80	0.76
		(3.72)	(2.14)	(3.90)	(4.61)	
1982-1984	22	25.39	0.34	0.92	0.96	0.77
		(2.25)	(3.12)	(2.71)	(5.47)	
1985-1987	22	-1.55	0.36	1.08	1.28	0.80
		(0.11)	(2.85)	(2.67)	(6.46)	
1988-1990	22	10.68	0.35	1.51	1.15	0.78
		(0.71)	(2.39)	(3.40)	(6.15)	

[a]OECD weighted average = 100. Food price levels are extrapolated from 1990 OECD price level estimate by food price indexes.

[b]Market support divided by Market Value for 11 agricultural products.

those of potential competitors in the EC countries (Bolin & Swedenborg, ed. 1992).

How successfully did these equations explain the food price levels of the high-price countries? As can be seen in Table 7, we had no success in explaining the extremely high Japanese food prices of the second half of the 1980s. The Japanese food price level in 1988-90 was 59 per cent above the OECD average and our equation for that period left about three quarters of that difference unexplained. We had no data for the next highest-price country, Iceland, but for Finland, with food prices 47 per cent above average, about 85 per cent of the difference was explained by the variables included in the equations. The explanation was not quite as complete for Sweden, but most of the price disparity relative to the other OECD countries is accounted for by these factors.

While the equations of Table 6 tell us that the independent variables included explain most of the variation across countries in food price levels, and the residuals of Table 7 show how much remains unexplained, neither shows us the explanation for any single country's food price level. The price level might be high in one country simply because per capita income is high (although that fact may require further explanation), and in another country because there is a high tax on food, and in a third country because agricultural products are heavily protected. For any particular country in any period, we can describe the contribution of each factor to the deviation of the food price level from the OECD average by substituting the country values into the equation for all the OECD countries, explaining some part of the price level and leaving some as an unexplained residual. As an example, in the period 1988-90, the explanation for the deviation of the Swedish price

Table 7

Residuals from Food Price Level Equations
FPL = f(RGDPC, FVAT, NPSE)
Six High-Food-Price Countries

	1979-1981	1982-1984	1985-1987	1988-1990
Denmark	5.81	4.10	4.36	6.67
Finland	6.66	4.56	7.56	6.43
Japan	7.76	13.47	34.55	46.21
Norway	-21.82	-5.00	-15.23	-6.31
Sweden	4.79	7.16	5.82	13.09
Switzerland	5.01	-2.56	-5.44	3.78

FPL = Food Price Level.

For definitions of other variables, see Table 4.

Source: Appendix Table 8.

level from the OECD average (the Swedish price level was 54 per cent above the average), could be divided into the following:

	Percentage Points
Per capita GDP	.2
Food VAT	25.0
Protection level	9.5
Unaccounted for (residual)	18.8
Total	53.6

Since Sweden's GDP per capita was very little different from the OECD average, it could not explain much of the difference in price levels. The agricultural protection level was higher than average, but not greatly so. The Swedish food VAT was much higher than the OECD average (23.5 per cent as against 6.9 per cent), and the level of protection in Sweden was somewhat higher than average (54.7 per cent as against 46.4 per cent), but not greatly so.

The explanation (or lack of it) provided by our equations for the various periods for six high-price countries is provided in Table 8. For most of the countries, the main identifiable factor producing high food prices was the level of protection of farm products, although in the Japanese case, most of the difference from the average is unexplained by our equations. The two exceptions were Denmark and Sweden, in both of which the high VAT rate on food was the strongest factor; Denmark's protection level was, in fact, below the OECD average. The largest residuals, or unexplained differences were for Japan in the late 1980s.

It is worth noting that the role of agricultural protection in raising food prices is underestimated when we analyze only differences from the OECD countries' average food prices, since most of them have relatively extensive agricultural protection. The absolute effect of protection can, however, be

Table 8

Factors Accounting for High Food Price Levels Relative to OECD Average
Six High-price Countries
[FPL = F(RGDPC, FVAT, NPSE)]

	1979-81	1982-84	1985-87	1988-90
Denmark	31.8	11.4	22.2	29.2
RGDPC	-.3	.7	1.4	-.4
FVAT	18.5	11.7	13.0	16.8
NPSE	-1.7	-3.8	-2.8	-1.5
Residual	15.2	2.8	10.6	14.4
Finland	35.4	35.4	46.5	57.5
RGDPC	-2.5	-1.8	-2.1	-1.1
FVAT	12.8	11.1	14.1	18.6
NPSE	12.9	17.6	23.6	29.1
Residual	12.2	8.3	10.9	11.0
Japan	30.5	32.9	59.8	70.0
RGDPC	-2.5	-1.8	-1.4	.2
FVAT	-7.3	-4.9	-6.5	-7.4
NPSE	20.1	25.8	31.4	28.1
Residual	20.4	13.8	36.3	49.0
Norway	34.5	37.1	41.5	53.8
RGDPC	-1.7	-1.1	0.3	-1.9
FVAT	21.4	13.6	15.1	19.8
NPSE	27.0	31.2	34.2	34.2
Residual	-12.2	-6.6	-8.2	1.8
Sweden	45.0	28.0	41.0	53.6
RGDPC	0.8	1.6	1.3	.2
FVAT	25.0	16.2	18.9	25.0
NPSE	3.4	1.0	9.5	9.5
Residual	15.8	9.2	11.2	18.8
Switzerland	32.9	31.4	40.6	47.5
RGDPC	7.4	9.8	9.4	8.2
FVAT	-7.3	-4.9	-6.5	-10.4
NPSE	22.0	27.7	36.3	34.3
Residual	10.8	-1.3	1.3	15.4

calculated from the estimated PSE coefficient. The complete elimination of protection by a single (smaller) country would hardly affect world prices. Thus, in the case of, e.g., Sweden - and based on 1988-1990 values, it would lead to a lowering of food prices of more than a third (Food price level, from Appendix Table 2, 153.6; NPSE, from Appendix Table 11, 52.5 per cent; and NPSE coefficient approximately 1.)

The results of Table 8, taken literally, imply that, in most high-price countries, food price levels could be reduced by reducing either the food VAT or the degree of protection of farm products. The coefficients for the protection variable seem large, considering the small part of consumers' food prices that is accounted for by farm-level costs. The equations may attribute to either protection or food VAT levels some costs attributable to the manufacturing, wholesale, or retail levels for which we have no direct measure of costs. One candidate is the level of wages in food processing and distribution. Several proxies were tried in an attempt to capture the effects of differences among countries in the inter-industry dispersion of wages, on the theory that low dispersion meant high wage levels in the trade sector. One proxy was a measure of differences in wages between the chemical industry and trade, but this was available only for fourteen countries and entailed too much of a loss of degrees of freedom. Another was the difference between chemicals and a low-wage manufacturing industry: textiles and apparel, but this variable reflected male-female wage differences since the chemical industry's employees were almost all male and the textile and garment industries had a large proportion of female employees. A recent paper by Gittleman and Wolff (1993) shows that among 14 OECD countries the three lowest in inter-industry wage dispersion were Finland, Denmark, and Sweden, a ranking

that suggests a role for high distribution costs. This is a question that needs further exploration.

Since the high food price countries are the same as the high price countries for all of GDP, and since the food industry is too small for policies specific to it to account for much of the GDP price level, we may want to introduce a variable to reflect the effect of policies that move overall price levels away from purchasing power parity. These would include macroeconomic policies that, in the short run, move exchange rates away from long-run equilibrium levels. And they would also include more long-run policies, such as low wage dispersion, that affect the cost structure, and therefore move the overall price level, away from purchasing power parity. Our proxy for this effect is the deviation of the general (GDP) price level from its "expected" level, as defined by the structural equations discussed earlier. The results based on these equations are shown in Table 9.

The addition of the PL deviation has little effect on the coefficients of the other variables, as compared with those of Table 6, but the explanatory power of the equations is increased. The coefficient for the general price level deviation is always positive and significant; thus the macroeconomic or exchange rate or structural influences on the general price level, not specific to the food sector, are a significat influence on absolute food price levels.

The introduction of the price level deviation variable substantially changes some of the residuals, as can be seen by a comparison of Table 10 with Table 7. The effect is most striking in 1988-90; for example, the residual for Finland is negative once the GDP price level deviation is introduced, and the residual for Japan is reduced greatly. In general, more than half of the

Table 9

Equations Relating Food Price Levels including VAT[a] to per Capita GDP, Food VAT, Net PSE, and Deviation of GDP price Level from Expected Value

	No. of Obs.	Constant Term	Coefficients				$\bar{R}^2$
			RGDPC	FVAT	NPSE	PLDEV	
	Food Price Levels Including VAT (FPL=F(RGDPC,FVAT,NPSE,PLDEV)						
1979-81	21	40.27	0.29	1.18	0.85	0.59	0.83
		(3.81)	(3.05)	(3.70)	(5.78)	(2.88)	
1982-84	22	25.42	0.34	0.91	0.96	0.56	0.88
		(3.18)	(4.38)	(3.77)	(7.79)	(4.35)	
1985-87	22	-1.27	0.36	0.76	1.32	0.9	0.92
		(.14)	(4.51)	(2.84)	(10.38)	(5.18)	
1988-90	22	11.19	0.35	0.67	1.24	1.04	0.94
		(1.43)	(4.70)	(2.60)	(12.67)	(7.08)	

[a] OECD = 100

PLDEV = Difference between country price level and expected price level derived from equations of Table 2.

Table 10

Residuals from Food Price Level Equations
including FVAT and General Price Level Deviations
FPL = F(RGDPC, FVAT, NPSE, PLDEV)
Six High-Price Countries

	1979-1981	1982-1984	1985-1987	1988-1990
Denmark	9.40	4.34	5.57	0.80
Finland	10.46	8.62	6.12	-3.66
Japan	7.14	9.85	13.18	14.14
Norway	-20.70	-15.93	-10.33	-2.01
Sweden	-1.01	6.37	7.65	6.76
Switzerland	1.86	2.51	-0.20	-2.83

Source: Appendix Table 9

previously unexplained levels of food prices in these countries in 1988-90 were the consequence of factors such as high values for the countries' currencies or other cost-raising influences outside the food sector.

If we again allocate the deviations of national food price levels from OECD averages for these high-price countries among the various factors accounting for them, we find that the food VAT has been generally the major influence for Denmark and Sweden, with protection of agriculture increasingly important in Sweden during the 1980s (Table 11). Agricultural protection has been the dominant explanation in the other four countries throughout the 1980s, with the food VAT an important, but declining, influence in Finland and Norway. High currency valuations were sporadically important for most countries, but particularly important for Japan in the second half of the 1980s. High real income levels were a factor only for Switzerland.

Food Prices Relative to General Price Levels

Another way of dealing with macroeconomic or exchange rate influences on food price levels is to compare food prices to general (GDP) price levels. This procedure is an alternative to the use of the price level deviations as a way of removing the effect of influences that affect price levels in general, such as exchange rates or monetary and fiscal policy. It assumes, in effect, that the effect of these general influences is multiplicative; a 10 per cent "overvaluation" of the currency produces a 10 per cent higher food price than would exist otherwise. Since both food prices and GDP price levels were consistently and positively related to real income (Tables 2 and 6), but the coefficients in the food price equations were much smaller, we expect a negative coefficient on per capita income in explaining relative food prices.

Table 11

Contribution of Each Factor to Difference Between
Country Food Price Level and OECD Average
OLS Equations with Price Level Deviation
Six High-Price Countries

Food Price Levels Including VAT
FPL= F(RGDPC,FVAT,NPSE,PLDEV)

	1979-1981	1982-1984	1985-1987	1988-1990
Denmark	31.79	11.42	22.24	29.24
RGDPC	-0.31	0.72	1.45	-0.43
FVAT	15.25	11.58	9.13	7.45
NPSE	-1.69	-3.81	-2.91	-1.60
PLDEV	1.13	-0.98	5.69	13.35
Residual	17.42	3.91	8.89	10.47
Finland	35.40	35.35	46.51	57.52
RGDPC	-2.95	-1.76	-2.11	-1.06
FVAT	10.53	11.00	9.93	8.23
NPSE	13.71	17.69	24.46	31.28
PLDEV	-4.28	0.13	4.92	13.03
Residual	18.40	8.30	9.31	6.04
Japan	30.49	32.87	59.79	70.01
RGDPC	-3.00	-1.81	-1.46	0.24
FVAT	-5.99	-4.80	-4.55	-3.27
NPSE	21.36	25.85	32.52	30.24
PLDEV	3.09	4.03	16.86	18.98
Residual	15.03	9.60	16.42	23.82
Norway	34.50	37.08	41.50	53.84
RGDPC	-2.04	-1.14	0.33	-1.94
FVAT	17.61	13.40	10.65	8.79
NPSE	28.66	31.35	35.47	36.76
PLDEV	3.09	9.75	2.19	2.53
Residual	-12.82	-16.27	-7.15	7.69
Sweden	45.00	27.98	40.98	53.58
RGDPC	0.92	1.66	1.34	0.19
FVAT	20.57	15.95	13.28	11.11
NPSE	3.72	0.99	9.89	10.26
PLDEV	12.78	3.47	5.56	15.56
Residual	6.99	5.90	10.90	16.46
Switzerland	32.88	31.41	40.57	47.54
RGDPC	8.80	9.87	9.48	8.25
FVAT	-5.99	-4.80	-4.55	-4.61
NPSE	23.33	27.85	37.66	36.89
PLDEV	-3.13	-3.65	-5.14	0.04
Residual	9.87	2.15	3.11	6.97

Relative food price levels are summarized in Table 12. The highest relative food price level in 1988-90 was in Japan. The ratios were also high in the Nordic countries, except for Denmark, and in Switzerland, as were the absolute food price levels. The relative food prices were also high in several of the poorer countries, Portugal, Spain, and Turkey, where absolute food price levels were low.

The lowest relative food prices were in Australia, New Zealand, the UK, and the U.S., all countries with low absolute food price levels, and all net agricultural exporters except the UK, which had a history prior to EC membership, of relatively free agricultural trade. Relative food prices were also fairly low in Germany and the Netherlands.

The relation between food prices and general price levels was quite consistent over the decade. Of the countries listed in Appendix Table 3, two thirds were either always high or always low in the four periods, twice as many with consistently high relative food prices as with consistently low ones.

Equations explaining relative food price levels are given in Table 13. Per capita GDP was a consistently negative and significant influence and the agricultural protection level a consistently positive influence. The coefficient for relative VAT was always positive but never statistically significant. The coefficients for agricultural protection levels are somewhat smaller than those in the food price level equations (Tables 6 and 9). One way of describing the difference is that the equations of Table 13 assume that agricultural protection affects only food prices, but not the aggregate price level. The food price level equations allow for the possibility that agricultural protection, or other types of protection that come with it, could

Table 12

Relative Food Prices[a] in Seven High-Price Countries and Three Other Countries with High Relative Food Prices

	1979-81	1982-84	1985-87	1988-90
Denmark	102.1	105.9	107.7	102.1
Finland	116.7	124.5	126.6	114.2
Iceland	111.9	106.4	119.8	126.5
Japan	122.5	128.6	130.0	129.7
Norway	91.9	99.3	111.5	115.9
Sweden	103.9	117.0	123.5	118.1
Switzerland	110.2	117.1	117.4	113.1
Portugal	134.0	145.4	138.5	126.8
Spain	107.0	110.4	114.0	110.6
Turkey	103.4	109.3	111.9	119.5

[a]Food Price Level as Per Cent of GDP Price Level.

Source: Appendix Table 3

Table 13

Equations Relating Relative Food Price Levels[a] to Per Capita GDP, Relative Food VAT,[b] and Net PSE

	No of Obs.	Constant Term	Coefficients RGDPC	RVAT	Net PSE	$\bar{R}^2$
1979-81	21	102.9	-.238	6.67	.407	.262
		(2.41)	(1.97)	(.13)	(2.04)	
1982-84	22	80.2	-.289	36.24	.506	.302
		(1.96)	(2.23)	(.75)	(2.22)	
1985-87	22	51.1	-.294	56.63	.621	.559
		(1.27)	(2.83)	(1.11)	(3.37)	
1988-90	22	49.61	-.235	54.54	.534	.629
		(1.71)	(2.75)	(1.59)	(4.99)	

[a] [Food price level (OECD=100) . GDP price level (OECD = 100)] x 100

[b] (Food VAT + 100) . (Standard VAT + 100)

also influence the aggregate price level, and the coefficients for protection in those equations incorporate both effects (on PL and on $\frac{FPL}{PL}$). On the whole, we prefer the FPL equations and use them to describe our main results.

The extent to which these equations failed to explain the relative food price levels is revealed by the residuals in Table 14. Among the high-price countries, the largest unexplained positive deviations in relative food prices were for Japan and Sweden, which are almost always at the high end of food price ranges. The largest negative unexplained deviation was for Norway. Thus, the high food price levels found earlier for Denmark and Norway were a reflection of their high price levels in general rather than of factors specific to food prices, a conclusion that corresponds to what we found when the "price level deviation" was included in a food price equation.

As with the food price level itself, we can use these equations to allocate the levels of relative food price levels to the various influences on them. Table 15 reports the results for six high-price countries. The major part of the explanation of high relative food prices is the level of protection, although there are still large unexplained residuals for some countries in some years. Sweden is a partial exception to the role of protection, in that the high level of the food VAT relative to the standard VAT is about as important a factor in raising relative food prices as is the protection level.

Treating Protection as Endogenous

It was suggested earlier that the surprisingly high coefficients for agricultural protection, given the small share of agricultural costs in the

Table 14

Residuals for Six High-Price Countries
from Relative Food Price Level Equations
[RFPL = F(RGDPC, RVAT, NPSE)]

	1979-81	1982-84	1985-87	1988-90
Denmark	3.02	1.61	2.59	1.19
Finland	8.95	7.24	6.85	-4.37
Japan	10.00	7.46	3.79	10.85
Norway	-25.34	-23.26	-9.72	-9.60
Sweden	.85	11.61	11.03	9.81
Switzerland	7.34	6.11	1.30	1.45

Source: Appendix Table 12.

Table 15

Factors Affecting Relative Food Price Levels
Seven High Relative Food Price Countries
1979-1990
[RFPL = F(RGDPC, RVAT, NPSE)]

	1979-81	1982-84	1985-87	1988-90
Finland	16.69	24.52	26.57	14.24
RGDPC	2.04	1.55	1.76	.61
RFVAT	.48	2.84	4.99	4.40
NPSE	6.41	9.21	11.04	12.61
Residual	7.77	10.92	8.79	-3.38
Italy	18.92	13.72	10.49	3.81
RGDPC	1.16	1.81	2.05	1.21
RFVAT	-.05	-.85	-.77	-1.32
NPSE	-.83	-1.98	-1.31	-.65
Residual	18.63	14.94	10.53	4.57
Japan	22.55	28.62	29.98	29.73
RGDPC	2.07	1.60	1.21	-.14
RFVAT	.48	2.84	4.99	4.40
NPSE	10.02	13.46	14.67	12.20
Residual	9.99	10.72	9.11	13.26
Norway	-8.08	-.66	11.51	15.94
RGDPC	1.41	1.01	-.28	1.11
RFVAT	.48	2.84	4.99	4.40
NPSE	13.45	16.33	16.00	14.82
Residual	-23.41	-20.83	-9.21	-4.39
Portugal	34.01	45.44	38.55	26.80
RGDPC	10.25	15.50	15.91	10.38
RFVAT	-.40	-2.42	-3.24	-3.51
NPSE	-.83	-1.98	-1.31	-.65
Residual	24.98	34.35	27.18	20.59
Sweden	3.92	17.04	23.53	18.11
RGDPC	-.64	-1.47	-1.11	-.11
RFVAT	.48	2.84	4.99	4.40
NPSE	1.71	.52	4.46	4.14
Residual	2.36	15.15	15.19	9.68
Switzerland	10.19	17.12	17.38	13.13
RGDPC	-6.07	-8.71	-7.90	-4.71
RFVAT	.19	.72	1.68	1.22
NPSE	10.94	14.50	16.99	14.87
Residual	5.12	10.61	6.60	1.74

prices of food products, might reflect the presence of other factors that affected both protection levels and food prices or an influence of the other independent variables on the protection levels. The protection rate could be a proxy for the agricultural price level (since it is calculated as a deviation of domestic prices from world market prices), or for the cost of preserving the farm population at some politically acceptable proportion of the total population or labor force, or the cost of bringing farm income up to equality with that of the rest of the population. If equality of farm and nonfarm income is the policy objective, the agricultural protection rate would be positively related to income per capita and to the general retail price level.

The idea that the level of protection may be itself determined by country characteristics, rather than being purely a policy choice, can be tested by asking whether we can explain the protection level. Table 16 gives an answer to that question, indicating that the protection level can be explained at least partly by factors determining the cost of agricultural production, even though our indicators of these factors are very crude: the average temperature in the coldest month and the amount of arable land per capita. (The addition of GDP per capita did not improve the explanation, indicating that high income per se does not require high support levels to bring farm incomes up to parity with nonfarm income. Use of average annual temperatures or the average for the hottest month produced poorer fits.[2])

[2]These are all questionable proxies for the cost of maintaining farm population. Another possibility would be some measure of the length of the growing season, but that is not a clear concept either. For one thing, it must vary from one crop to another.

Table 16

Estimation of NPSE from Variables Representing the Cost of Agricultural Protection
[NPSE = F(LANDC, COLD)]

	1979-81	1982-84	1985-87	1988-90
Constant	45.30	44.73	57.83	56.54
	(13.69)	(13.56)	(18.96)	(15.07)
LANDC[a]	-12.56	-10.85	-13.08	-14.32
	(3.38)	(2.93)	(3.75)	(3.34)
COLD[b]	-1.11	-1.11	-1.45	-1.67
	(2.23)	(2.25)	(3.16)	(2.96)
$\bar{R}^2$	.367	.315	.471	.419
Residuals for Six High-Price Countries				
Denmark	-3.66	-4.62	-1.33	-7.84
Finland	7.35	9.84	5.42	9.55
Japan	19.67	24.40	22.66	20.07
Norway	22.10	23.13	14.76	15.13
Sweden	-2.95	-6.73	.76	-4.25
Switzerland	19.80	24.20	23.06	18.95

[a]LANDC = Hectares of Arable Land per capita

[b]COLD = Average temperature in coldest month

The worse the conditions for agriculture, the higher the protection. In effect, there is something like an inelastic demand for the retention of agriculture, the higher the price of retention, the greater the agricultural subsidies.

These equations explained the protection levels for Denmark and Sweden quite well, but not those for Japan, Norway, and Switzerland, which are extreme. In the latter three countries, the protection levels were substantially higher than predicted from these variables. These countries may have had a stronger public demand for the promotion of farming, or other cost factors (mountainous terrain?) that we did not include, that made supporting farmers more expensive; that is they required a higher level of protection for a given retention of farm population.

The equations for the protection level can be used as the first stage in a two-stage least squares estimation of food price levels, in which the estimated net PSE enters in place of the actual PSE in the second stage. The second-stage equations for the food price level and the food price level net of food VAT are shown in Table 17.

Treating the degree of protection of farm products as endogenous did have a strong effect on the coefficients of the protection variable, reducing them by between a third and a half in most cases. They still seem high, given the low ratio of farm prices to final food prices, but at least none is above one. We may have removed some spurious protection effects but we may also, because our first stage equation was so crude, have removed some genuine effects of agricultural protection. Aside from that difference, most of the coefficients were not very different from those of Table 9. The per capita income coefficients are a little higher here and those for the price level

Table 17

Second-stage Equations Explaining Food Prices

[FPL = F(RGDPC, FVAT, $\hat{NPSE}$, PLDEV)]

	1979-91	1982-84	1985-87	1988-90
Constant	51.99	36.37	14.31	21.39
	(4.60)	(4.60)	(1.84)	(2.63)
RGDPC	.310	.371	.435	.459
	(2.79)	(4.61)	(5.79)	(5.71)
FVAT	1.45	1.13	1.13	1.21
	(4.10)	(4.57)	(4.68)	(4.51)
$\hat{NPSE}$	.455	.545	.817	.733
	(4.62)	(7.27)	(11.14)	(11.69)
PLDEV	.465	.407	.824	.868
	(1.99)	(2.98)	(5.05)	(5.53)
$\bar{R}^2$	.779	.872	.927	.931

deviation a little lower, and there is a smaller range of coefficients from one period to another. On the whole, these estimates confirm the earlier findings, and add to our confidence in them.

The residuals from the two sets of equations show that for at least some high-price countries the price level can be explained by protection, food VAT rates, per capita income, and the degree to which the value of the currency deviates from the value that would be predicted from purchasing power parity and the per capita income (Table 18). However, part of the high food price in Japan remains consistently unexplained and these factors consistently more than explain Norway's price level.

When we analyze the deviations of country price levels from OECD averages in each period we find that in the great majority of the cases, especially after 1979-81, most of the difference between each high price country's food price level and the OECD average is explained by these variables (Table 19). However, the sources of the high price levels differ among the countries. In all the Nordic countries, a high food VAT is an important factor, the most important in Denmark and Sweden. In Japan and Switzerland, the high protection level is the main factor, and in Finland and Norway, high food VATs and high protection share the responsibility for high food prices, with protection gaining in importance over time. Currency "overvaluation" in the sense of exchange rates higher than those expected on the basis of general price levels and real per capita income, was consistently important only for Japan, but sporadically a substantial cause of high food prices in other countries. These include Sweden in 1979-81, and Denmark, Finland, and Sweden in 1988-90. Switzerland was the only country in which a high per capita income played an important role in the high food price level.

Table 18

Residuals for Six High-Price Countries from Second-Stage Equations Explaining Food Prices

	1979-81	1982-84	1985-87	1988-90
Denmark	7.16	2.16	3.55	-1.20
Finland	10.25	8.50	5.75	-4.14
Japan	9.61	10.61	12.32	16.66
Norway	-21.41	-15.42	-14.19	-5.42
Sweden	.01	6.86	6.03	5.33
Switzerland	3.29	1.06	-3.64	-3.21

Table 19

Contribution of Each Factor to Difference Between
Country Food Price Level and OECD Average
2SLS Equations with Price Level Deviation
Six High-Price Countries

	1979-1981	1982-1984	1985-1987	1988-1990
			$\widehat{FPL} = F(RGDPC, FVAT, \widehat{NPSE}, PLDEV)$	
Denmark	**31.79**	**11.42**	**22.24**	**29.24**
RGDPC	-0.33	0.78	1.73	-0.57
FVAT	18.73	14.38	13.58	13.45
$\widehat{NPSE}$	-2.58	-5.29	-5.55	-3.92
PLDEV	0.90	-0.71	5.19	11.17
Residual	15.07	2.26	7.30	9.10
Finland	**35.40**	**35.35**	**46.51**	**57.52**
RGDPC	-3.16	-1.91	-2.53	-1.40
FVAT	12.93	13.66	14.76	14.86
$\widehat{NPSE}$	10.67	15.19	20.43	26.85
PLDEV	-3.41	0.09	4.48	10.90
Residual	18.37	8.33	9.36	6.31
Japan	**30.49**	**32.87**	**59.79**	**70.01**
RGDPC	-3.21	-1.97	-1.74	0.31
FVAT	-7.37	-5.96	-6.76	-5.91
$\widehat{NPSE}$	20.78	27.28	37.01	32.67
PLDEV	2.46	2.95	15.36	15.87
Residual	17.83	10.58	15.92	27.05
Norway	**34.50**	**37.08**	**41.50**	**53.84**
RGDPC	-2.18	-1.24	0.40	-2.54
FVAT	21.63	16.64	15.84	15.87
$\widehat{NPSE}$	25.81	30.07	33.87	33.30
PLDEV	2.47	7.14	2.00	2.12
Residual	13.23	-15.51	-10.60	5.09
Sweden	**45.00**	**27.98**	**40.98**	**53.58**
RGDPC	0.99	1.81	1.60	0.25
FVAT	25.28	19.81	19.75	20.06
$\widehat{NPSE}$	0.71	-2.68	4.82	4.58
PLDEV	10.18	2.54	5.07	13.02
Residual	7.84	6.50	9.75	15.68
Switzerland	**32.88**	**31.41**	**40.57**	**47.54**
RGDPC	9.41	10.74	11.32	10.84
FVAT	-7.37	-5.96	-6.76	-8.33
$\widehat{NPSE}$	21.78	28.19	40.69	37.76
PLDEV	-2.49	-2.68	-4.68	0.04
Residual	11.56	1.12	0.00	7.23

Conclusions

There have been wide differences among the OECD countries in the levels of food prices paid by consumers, and these food price levels, whether high or low, have tended to be persistent, at least over the 1980s. Denmark, Finland, Iceland, Japan, Norway, Sweden, and Switzerland, almost always had high food prices, and Australia, New Zealand, and the U.S., low food prices.

The major elements determining food price levels are the level of protection of agricultural products and the VAT rate on food, both policy instruments in the power of governments to change. A third element is the exchange rate or general price level, presumably at least partly a product of macroeconomic policy, but not necessarily subject to ready alteration. The degree to which the exchange rate or general price level departs from what we call its "structural" level was particularly important for Japan, in recent years, and occasionally for other countries.

The responsibility for high food prices was distributed differently from one country to another. The level of the food VAT was consistently the most important influence in Denmark and Sweden. In Finland, Japan, Norway, and Switzerland the agricultural protection level outweighed the food VAT, although the high food VAT also played a major role in Finland. High general price levels relative to what we would expect from "structural" variables, presumably some reflection of these countries' macroeconomic policy, were a major factor for Japanese food price levels throughout 1985-90, and for Danish and Swedish prices for 1979-81 and 1988-90.

These comparisons of country food price levels with the OECD average understate the effects of protection, or of removing protection altogether, since the OECD average to which we compare the high-price countries is heavily

weighted by countries with quite high protection levels. A reversion to U.S. protection levels, still well above those of Australia and New Zealand, might be a better measure of these possibilities. It would suggest the possibility of much larger reductions in consumer food prices and a larger share attributable to protection levels.

The distribution of income may be a missing variable in this analysis; high food prices at the retail level might be a consequence of high retail wages due to a system of narrow wage differentials. In a country with large wage differentials, retail establishments might hire low-wage, low-skill or part-time workers to produce cheap retailing service. That would not be feasible in a country in which there was a very narrow range of wage rates.

We lacked data covering many countries on inter-industry wage differences across all industries including trade and services. A rough proxy for wage inequality, based on differences among manufacturing industries, did not help to explain food price levels. One reason, we suspect, is that the measurement of inter-industry differentials could not be disentangled from sex differentials in wages. Japan, usually described as a country of relatively equal wages, in fact has large inter-industry differences where the sex composition of the labor force differs greatly. Furthermore the interindustry variance within manufacturing is not a good proxy for intersectoral variance, which is what we would need to know.

Another possibly significant missing variable is the degree of competition in the food wholesaling and retailing sectors and the possibly related degree of efficiency in these sectors. There is evidence that competitive pressures in retailing are weak in Sweden, and perhaps in Finland, but we do not have systematic information. High food prices to consumers may

reflect these characteristics of the trade sector in addition to the farm protection, taxation, exchange rate, and per capita income variables included here.

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Appendix Table 1

GDP PRICE LEVELS, 1979-1990, BY THREE-YEAR PERIODS

(OECD AVERAGE =100)

	1979-81	1982-84	1985-87	1988-90
Australia	107.10	112.81	86.05	96.44
Austria	98.75	86.88	112.95	103.15
Belgium	116.44	82.85	89.52	97.13
Canada	97.94	113.27	96.91	98.59
Denmark	129.05	105.19	113.93	126.57
Finland	116.03	108.70	115.75	137.88
France	110.27	89.05	94.71	100.73
Germany	113.90	94.11	99.01	107.57
Greece	86.32	76.63	66.98	72.61
Iceland	134.48	117.47	121.24	129.44
Ireland	96.93	90.61	94.12	97.39
Italy	79.84	75.70	83.70	95.78
Japan	106.48	103.31	122.93	131.05
Luxembourg	113.67	86.64	90.41	97.77
Netherlands	113.96	94.24	94.24	106.98
New Zealand	84.05	78.81	75.87	89.03
Norway	146.32	138.00	126.90	132.68
Portugal	53.08	45.47	48.51	57.39
Spain	83.11	65.20	68.92	84.80
Sweden	139.53	109.35	114.13	130.03
Switzerland	120.58	112.20	119.76	130.41
Turkey	76.83	55.79	45.70	44.51
U. K.	99.13	88.69	84.01	91.77
U. S.	95.01	112.07	103.33	89.58

Appendix Table 2

Food Price Levels, 1979-1990, By Three-Year Periods
(OECD Average = 100)

COUNTRY	1979-1981	1982-1984	1985-1987	1988-1990
Australia	87.4	91.4	71.5	78.8
Austria	104.6	91.9	99.8	104.8
Belgium	115.3	89.3	97.0	100.6
Canada	89.7	105.8	95.0	94.7
Denmark	131.8	111.4	122.2	129.2
Finland	135.4	135.4	146.5	157.5
France	105.7	89.7	96.5	101.6
Germany	109.3	94.1	96.4	99.9
Greece	83.4	79.3	71.6	76.9
Iceland	150.5	125.0	145.2	163.7
Ireland	102.3	88.3	92.4	95.2
Italy	94.9	86.1	92.5	99.4
Japan	130.5	132.9	159.8	170.0
Luxembourg	110.8	87.5	94.3	98.1
Netherlands	114.9	96.5	95.7	96.9
New Zealand	73.0	70.4	66.4	76.4
Norway	134.5	137.1	141.5	153.8
Portugal	71.1	66.1	67.2	72.8
Spain	88.9	72.0	78.6	93.8
Sweden	145.0	128.0	141.0	153.6
Switzerland	132.9	131.4	140.6	147.5
Turkey	79.4	61.0	51.1	53.2
United Kingdom	90.7	78.9	72.1	77.6
United States	81.2	94.6	89.2	80.0

Appendix Table 3

Food Price Levels as Per Cent of GDP Price Levels, 1979-1990
by Three Year Periods
(OECD=100)

Country	1979-1981	1982-1984	1985-1987	1988-1990
Australia	81.6	81.0	83.1	81.7
Austria	105.9	105.8	88.4	101.6
Belgium	99.0	107.7	108.3	103.6
Canada	91.5	93.4	98.1	96.0
Denmark	102.1	105.9	107.7	102.1
Finland	116.7	124.5	126.6	114.2
France	95.9	100.8	101.9	100.8
Germany	95.9	100.0	97.3	92.9
Greece	96.6	103.5	106.9	105.9
Iceland	111.9	106.4	119.8	126.5
Ireland	105.5	97.5	98.2	97.7
Italy	118.9	113.7	110.5	103.8
Japan	122.5	128.6	130.0	129.7
Luxembourg	97.5	101.0	104.3	100.4
Netherlands	100.9	102.4	101.6	90.6
New Zealand	86.9	89.4	87.5	85.8
Norway	91.9	99.3	111.5	115.9
Portugal	134.0	145.4	138.5	126.8
Spain	107.0	110.4	114.0	110.6
Sweden	103.9	117.0	123.5	118.1
Switzerland	110.2	117.1	117.4	113.1
Turkey	103.4	109.3	111.9	119.5
United Kingdom	91.5	89.0	85.8	84.6
United States	85.5	84.4	86.4	89.3

Appendix Table 4

Estimated Standard (S) and Food (F) VAT Rates and Equivalent Sales Tax Rates (Per Cent) 1970-1990

		1970	1971	1972	1973	1974	1975	1976	1977	1978	1979
Australia	S	15	15	15	15	15	15	15	15	15	15
	F	0	0	0	0	0	0	0	0	0	0
Austria	S	5.5	5.5	5.5	16	16	16	18	8	8	8
	F	1.7	1.7	1.7	8	8	8	8	8	8	8
Belgium	S	NA	18	18	18	18	18	18	18	16	16
	F	NA	6	6	6	6	6	6	6	6	6
Canada	S	18.5	18.5	18.5	18.5	12	12	12	12	12	9
	F	0	0	0	0	0	0	0	0	0	0
Denmark	S	15	15	15	15	15	15	15	18	20.25	20.25
	F	15	15	15	15	15	15	15	18	18	18
Finland	S	11	11	11	11	11	11	11	11	14	14
	F	11	11	11	11	11	11	11	11	14	14
France	S	18.7	18.7	18.7	20	20	20	20	17.6	17.6	17.6
	F	7.5	7.5	7.5	7	7	7	7	7	7	7
Germany	S	11	11	11	11	11	11	11	11	12	13
	F	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	6	6
Greece	S	0	0	0	0	0	0	0	0	0	0
	F	0	0	0	0	0	0	0	0	0	0
Iceland	S	7.5	11	11	13	17	20	20	20	20	20
	F	7	9	9	10	12	10	10	10	0	0
Ireland	S	NA	NA	16.37	19.5	19.5	19.5	20	20	20	20
	F	0	0	0	0	0	0	0	0	0	0
Italy	S	NA	NA	NA	12	12	12	12	14	14	14
	F	NA	NA	NA	6	6	6	6	6	6	6
Japan	S	0	0	0	0	0	0	0	0	0	0
	F	0	0	0	0	0	0	0	0	0	0
Luxembourg	S	8	10	10	12	12	12	12	12	12	12
	F	4	4	4	4	4	4	4	4	4	4
Netherlands	S	12	14	14	16	16	16	18	18	18	18
	F	4	4	4	4	4	4	4	4	4	4
New Zealand	S	20	20	20	20	20	20	20	20	20	20
	F	0	0	0	0	0	0	0	0	0	0
Norway	S	20	20	20	20	20	20	20	20	20	20
	F	20	20	20	20	20	20	20	20	20	20
Portugal	S	7	7	7	7	7	7	10	10	10	15
	F	0	0	0	0	0	0	0	0	0	0
Spain	S	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	F	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sweden	S	11.1	17.65	17.65	17.65	13.64	17.65	17.65	20.63	20.63	20.63
	F	11.1	17.65	17.65	17.65	13.64	17.65	17.65	20.63	20.63	20.63
Switzerland	S	3.6	3.6	4	4	4.4	4.4	4.4	4.4	4.4	4.4
	F	0	0	0	0	0	0	0	0	0	0
Turkey	S	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	F	0	0	0	0	0	0	0	0	0	0
U.K.	S	NA	NA	NA	10	8	8	8	8	8	15
	F	0	0	0	0	0	0	0	0	0	0
U.S.	S	NA	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6
	F	1	1	1	1	1	1	1	1	1	1

Appendix Table 4 (continued)

		1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
Australia	S	15	17.5	20	20	20	20	20	20	20	20	20
	F	0	0	0	0	0	0	0	0	0	0	0
Austria	S	8	8	8	8	20	20	20	20	20	20	20
	F	8	8	8	8	10	10	10	10	10	10	10
Belgium	S	16	17	17	19	19	19	19	19	19	19	19
	F	6	6	6	6	6	6	6	6	6	6	6
Canada	S	9	9	9	9	9	10	12	12	12	13	13.5
	F	0	0	0	0	0	0	0	0	0	0	0
Denmark	S	22	22	22	22	22	22	22	22	22	22	22
	F	18	18	18	18	18	18	18	18	18	18	18
Finland	S	14	14	14	19.05	19.05	19.05	19.05	19.05	19.05	19.4	19.05
	F	14	14	14	19.05	19.05	19.05	19.05	19.05	19.05	19.4	19.05
France	S	17.6	17.6	18.6	18.6	18.6	18.6	18.6	18.6	18.6	18.6	18.6
	F	7	7	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5
Germany	S	13	13	13	14	14	14	14	14	14	14	14
	F	6	6	6	7	7	7	7	7	7	7	7
Greece	S	0	0	0	0	0	0	18	16	16	16	18
	F	0	0	0	0	0	0	6	6	6	6	8
Iceland	S	22	23.5	23.5	23.5	23.5	24	26	26	26	26	24.5
	F	0	0	0	0	0	0	0	5	2.5	2.5	2.5
Ireland	S	25	25	30	30	30	23	25	25	25	25	23
	F	0	0	0	0	0	0	0	0	0	0	0
Italy	S	15	15	18	18	18	18	18	18	19	19	19
	F	6	6	9	6	6	6	6	6	6	6.5	6.5
Japan	S	0	0	0	0	0	0	0	0	0	3	3
	F	0	0	0	0	0	0	0	0	0	3	3
Luxembourg	S	12	12	12	12	12	12	12	12	12	12	12
	F	4	4	4	4	4	4	4	4	4	4	6
Netherlands	S	18	18	18	18	19	19	20	20	20	18.5	18.5
	F	4	4	4	4	5	5	6	6	6	6	6
New Zealand	S	20	20	20	20	20	20	20	10	12.5	12.5	12.5
	F	0	0	0	0	0	0	0	10	12.5	12.5	12.5
Norway	S	20	20	20	20	20	20	20	20	20	20	20
	F	20	20	20	20	20	20	20	20	20	20	20
Portugal	S	15	15	15	17	17	17	17	17	17	17	17
	F	0	0	0	0	0	0	0	0	0	0	0
Spain	S	2	3	3.7	4.3	5	5	12	12	12	12	12
	F	2	3	3.7	4.3	5	5	6	6	6	6	6
Sweden	S	23.46	23.46	21.51	23.46	23.46	23.46	23.46	23.46	23.46	23.46	23.46
	F	23.46	23.46	21.51	23.46	23.46	23.46	23.46	23.46	23.46	23.46	23.46
Switzerland	S	4.4	4.4	4.4	6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.2
	F	0	0	0	0	0	0	0	0	0	0	0
Turkey	S	NA	NA	NA	NA	NA	10	10	12	12	12	12
	F	0	0	0	0	0	0	3	3	3	3	3
U.K.	S	15	15	15	15	15	15	15	15	15	15	9
	F	0	0	0	0	0	0	0	0	0	0	0
U.S.	S	4.6	4.6	4.6	4.6	4.6	4.6	5	5	5	6	6
	F	1	2	2	2	2	2	2	2	2	2	2

Sources: Various issues of Canada Yearbook, U.S. Department of Commerce, Overseas Business Reports, Price Waterhouse, Doing Business in _____.
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Appendix Table 5

Residuals from General (GDP) Price Level Equations
PL = F(RGDPC, INDT, NPSE)

	1979-1981	1982-1984	1985-1987	1988-1990
Australia	17.08	29.42	6.93	23.30
Austria	-8.76	-10.24	-0.68	-4.34
Belgium	11.08	-13.83	-5.21	-7.68
Canada	-12.93	14.94	-16.63	-5.08
Denmark	3.76	-0.61	3.59	9.84
Finland	-5.65	-2.84	5.51	11.09
France	-1.78	-14.95	-6.29	-10.33
Germany	6.07	-5.79	-2.70	-3.15
Greece	6.04	7.32	-5.39	-6.99
Iceland	NA	NA	NA	NA
Ireland	11.35	15.28	20.94	10.39
Italy	-15.48	-13.75	-8.53	-9.23
Japan	2.04	7.55	23.87	21.64
Luxembourg	9.08	-14.86	-14.06	-18.56
Netherland	8.78	1.19	-0.81	-4.33
New Zealand	2.86	-5.26	-3.28	19.05
Norway	10.04	16.37	-3.30	1.72
Portugal	-26.66	-23.12	-23.99	-23.64
Spain	10.55	-7.71	-7.24	-1.50
Sweden	27.94	2.10	5.50	13.56
Switzerland	-4.10	-5.02	-4.87	-6.32
Turkey	NA	NA	NA	NA
U.K.	3.26	-4.28	-9.64	-11.30
U.S.A.	-9.72	8.15	-5.61	-11.34

Appendix Table 6

Residuals from General (GDP) Price Level Equations
PL = F(RGDPC, SVAT, NPSE)

	1979-1981	1982-1984	1985-1987	1988-1990
Australia	14.93	25.70	4.95	16.66
Austria	7.53	-2.18	-2.44	-5.65
Belgium	11.45	-14.25	-8.37	-11.47
Canada	-6.22	18.74	-15.21	-3.54
Denmark	13.44	5.70	6.42	11.05
Finland	2.87	-0.96	3.85	10.41
France	0.83	-12.97	-7.14	-11.81
Germany	6.63	-5.18	-2.92	-2.95
Greece	22.25	15.80	-5.60	-3.46
Iceland	NA	NA	NA	NA
Ireland	0.47	11.33	15.63	3.92
Italy	-22.42	-17.73	-13.10	-11.97
Japan	-2.38	2.71	25.35	23.91
Luxembourg	11.58	-11.18	-10.19	-13.26
Netherland	5.97	-0.50	-4.58	-7.08
New Zealand	-10.51	-13.32	-8.78	25.32
Norway	13.94	21.17	-0.56	3.22
Portugal	-28.04	-24.76	-21.74	-20.93
Spain	9.98	-10.42	-6.48	0.35
Sweden	19.14	0.65	-0.08	7.26
Switzerland	-11.49	-10.11	-7.13	-6.27
Turkey	NA	NA	NA	NA
U.K.	2.08	-3.75	-8.52	-9.96
U.S.A.	-8.40	6.69	-2.26	-8.80

Appendix Table 7

Residuals from General (GDP) Price Level
Net of General VAT
PLNV = F(RGDPC, NPSE)

	1979-1981	1982-1984	1985-1987	1988-1990
Australia	16.91	26.02	10.48	11.79
Austria	2.43	-2.79	15.24	-4.51
Belgium	7.84	-14.96	-8.01	-9.82
Canada	-5.59	18.57	-6.07	-9.68
Denmark	14.52	1.44	7.38	14.53
Finland	0.79	0.62	2.37	12.16
France	-4.01	-13.93	-7.45	-9.64
Germany	1.97	-5.60	-1.90	-0.90
Greece	18.71	25.43	5.51	-3.57
Iceland	NA	NA	NA	NA
Ireland	1.69	3.60	13.34	4.87
Italy	-25.56	-19.90	-12.50	-10.57
Japan	-0.99	7.74	22.94	20.98
Luxembourg	7.69	-9.56	-9.33	-12.15
Netherland	2.23	-2.85	-3.93	2.04
New Zealand	-10.81	-11.99	2.86	23.32
Norway	11.18	18.01	2.32	4.59
Portugal	-29.91	-22.83	-19.64	-21.47
Spain	NA	-0.73	-2.25	-0.14
Sweden	17.32	0.35	-0.99	9.23
Switzerland	-13.27	-9.20	-7.14	-0.13
Turkey	NA	NA	NA	NA
U.K.	-4.67	-1.91	-8.54	-8.17
U.S.A.	-8.47	14.47	5.30	-12.75

Appendix Table 8

Residuals from Food Price Level Equations
FPL = F(RGDPC, FVAT, NPSE)

	1979-1981	1982-1984	1985-1987	1988-1990
Australia	5.71	22.03	18.60	26.12
Austria	1.94	-1.54	-1.95	-2.27
Belgium	11.63	-6.85	-5.21	-3.57
Canada	-7.56	15.83	-14.51	6.07
Denmark	5.81	4.10	4.36	6.67
Finland	6.66	4.56	7.56	6.43
France	-1.87	-10.39	-7.35	-3.23
Germany	1.79	-5.83	-11.23	-8.52
Greece	-2.62	5.49	-16.09	-5.94
Iceland	NA	NA	NA	NA
Ireland	10.83	11.55	11.43	14.81
Italy	-8.10	-7.84	-8.85	-2.62
Japan	7.76	13.47	34.55	46.21
Luxembourg	7.35	-10.17	-10.08	-9.12
Netherland	13.82	2.32	-5.90	-4.78
New Zealand	-7.44	-19.10	-7.84	13.24
Norway	-21.82	-5.00	-15.23	-6.31
Portugal	-14.24	-9.12	-13.62	-3.21
Spain	-3.98	-15.45	-13.13	2.86
Sweden	4.79	7.16	5.82	13.09
Switzerland	5.01	-2.56	-5.44	3.78
Turkey	NA	NA	NA	NA
U.K.	-0.75	-11.88	-25.26	-13.69
U.S.A.	-17.76	-9.39	-13.96	-9.09

FPL = Food Price Level.

For definitions of other variables, see Table 4.

Appendix Table 9

Residuals from Equations for Food Price Level
including General Price Level Deviations
FPL = F(RGDPC, FVAT, NPSE, PLDEV)

	1979-1981	1982-1984	1985-1987	1988-1990
Australia	-1.37	4.02	9.46	2.10
Austria	8.50	3.32	-13.94	1.00
Belgium	4.83	0.78	3.21	1.27
Canada	0.46	7.76	1.86	4.37
Denmark	9.40	4.34	5.57	0.80
Finland	10.46	8.62	6.12	-3.66
France	0.16	-0.69	1.41	2.45
Germany	-1.39	-2.39	-5.63	-9.74
Greece	-4.35	0.90	-5.94	-5.26
Iceland	NA	NA	NA	NA
Ireland	9.90	3.16	-4.45	-4.79
Italy	1.37	-1.77	1.72	1.88
Japan	7.14	9.85	13.18	14.14
Luxembourg	2.30	-1.32	4.27	4.82
Netherland	7.70	2.28	-1.82	-12.65
New Zealand	-8.95	-9.53	1.42	2.38
Norway	-20.70	-15.93	-10.33	-2.01
Portugal	-8.66	4.04	9.20	12.29
Spain	NA	-9.86	-3.55	-0.95
Sweden	-1.01	6.37	7.65	6.76
Switzerland	1.86	2.51	-0.20	-2.83
Turkey	NA	NA	NA	NA
U.K.	-4.93	-7.53	-11.80	-11.64
U.S.A.	-12.71	-8.94	-7.41	-0.76

Appendix Table 9 (continued)

Residuals from Equations for Food Price Level
net of VAT including General Price Level Deviations
FPLNV = F(RGDPC, NPSE, PLDEV)

		1979-1981	1982-1984	1985-1987	1988-1990
1	Australia	-2.12	4.23	10.15	4.68
2	Austria	9.58	2.94	-14.35	-0.33
3	Belgium	4.72	0.71	3.03	1.05
4	Canada	-0.01	8.29	3.14	5.50
5	Denmark	11.59	3.18	2.97	-1.74
6	Finland	11.74	7.80	3.93	-5.68
7	France	0.60	-0.67	1.36	2.21
8	Germany	-1.44	-2.46	-5.84	-9.83
9	Greece	-4.93	1.15	-5.88	-5.68
10	Iceland	NA	NA	NA	NA
11	Ireland	9.11	3.46	-2.56	-1.64
12	Italy	2.16	-1.95	1.42	1.42
13	Japan	5.21	10.79	16.38	18.20
14	Luxembourg	1.84	-1.16	4.37	4.11
15	Netherland	7.30	2.37	-1.75	-11.93
16	New Zealand	-9.26	-9.17	1.24	0.69
17	Norway	-19.33	-16.77	-12.49	-5.02
18	Portugal	-8.82	4.27	9.54	12.54
19	Spain	NA	-9.93	-3.99	-0.76
20	Sweden	1.13	4.85	4.07	2.95
21	Switzerland	-0.25	3.64	2.47	0.53
22	Turkey	NA	NA	NA	NA
23	U.K.	-5.73	-7.06	-10.72	-10.33
24	U.S.A.	-13.09	-8.53	-6.49	-0.95

Appendix Table 10

Residuals from Relative Food Price Level Equations
RFPL = F(RGDPC, RVAT, NPSE)

	1979-1981	1982-1984	1985-1987	1988-1990
Australia	-8.01	-6.27	5.01	4.20
Austria	8.64	3.06	1.84	3.14
Belgium	-0.15	7.06	2.99	4.06
Canada	-0.15	-1.98	0.48	5.23
Denmark	3.02	1.61	2.59	1.19
Finland	8.95	7.24	6.85	-4.37
France	-2.80	1.82	-0.62	4.62
Germany	-1.19	0.59	-5.71	-4.82
Greece	-15.20	-16.21	-11.04	-3.97
Iceland	NA	NA	NA	NA
Ireland	-9.39	-12.73	-13.86	-4.55
Italy	18.11	11.08	5.35	6.18
Japan	10.00	7.46	3.79	10.85
Luxembourg	-2.44	1.06	2.12	3.23
Netherland	1.69	0.24	-2.50	-1.61
New Zealand	-6.57	-14.06	-8.96	-1.74
Norway	-25.34	-23.26	-9.72	-9.60
Portugal	20.31	30.60	19.67	19.58
Spain	-2.76	-4.63	-2.39	4.13
Sweden	0.85	11.61	11.03	9.81
Switzerland	7.34	6.11	1.30	1.45
Turkey	NA	NA	NA	NA
U.K.	-10.84	-13.80	-22.04	-12.63
U.S.A.	-0.89	-11.29	-7.68	2.22

RFPL = Food Price Level as per cent of GDP Price Level.

Appendix Table 11

Measures of Agricultural Protection in OECD Countries

CODE	COUNTRY		1979-1981	1982-1984	1985-1987	1988-1990
1	Australia	GPSE	8.44	12.15	13.54	10.11
		NPSE	9.01	10.97	15.50	9.50
		CSE	NA	NA	-8.00	-8.00
2	Austria	GPSE	31.65	31.80	50.83	50.56
		NPSE	28.82	29.76	46.52	38.82
		CSE	NA	NA	-50.00	-50.00
3	Belgium	GPSE	39.23	36.54	52.84	50.25
		NPSE	35.13	34.49	49.81	41.38
		CSE	NA	NA	-44.00	-44.00
4	Canada	GPSE	26.22	30.04	48.13	40.77
		NPSE	24.87	27.69	50.51	36.58
		CSE	NA	NA	-30.00	-30.00
5	Denmark	GPSE	39.23	36.54	52.84	50.25
		NPSE	35.13	34.49	49.81	41.38
		CSE	NA	NA	-44.00	-44.00
6	Finland	GPSE	59.29	65.46	80.76	82.71
		NPSE	52.94	55.82	66.04	69.66
		CSE	NA	NA	-69.00	-69.00
7	France	GPSE	39.23	36.54	52.84	50.25
		NPSE	35.13	34.49	49.81	41.38
		CSE	NA	NA	-44.00	-44.00
8	Germany	GPSE	39.23	36.54	52.84	50.25
		NPSE	35.13	34.49	49.81	41.38
		CSE	NA	NA	-44.00	-44.00
9	Greece	GPSE	39.23	36.54	52.84	50.25
		NPSE	35.13	34.49	49.81	41.38
		CSE	NA	NA	-44.00	-44.00
10	Iceland	GPSE	NA	NA	NA	NA
		NPSE	NA	NA	NA	NA
		CSE	NA	NA	NA	NA
11	Ireland	GPSE	39.23	36.54	52.84	50.25
		NPSE	35.13	34.49	49.81	41.38
		CSE	NA	NA	-44.00	-44.00

Appendix Table 11 (concluded)

12	Italy	GPSE	39.23	36.54	52.84	50.25
		NPSE	35.13	34.49	49.81	41.38
		CSE	NA	NA	-44.00	-44.00
13	Japan	GPSE	62.08	64.26	73.74	71.19
		NPSE	60.79	65.00	75.17	70.53
		CSE	NA	NA	-53.00	-53.00
14	Luxembourg	GPSE	39.23	36.54	52.84	50.25
		NPSE	35.13	34.49	49.81	41.38
		CSE	NA	NA	-44.00	-44.00
15	Netherlands	GPSE	39.23	36.54	52.84	50.25
		NPSE	35.13	34.49	49.81	41.38
		CSE	NA	NA	-44.00	-44.00
16	New Zealand	GPSE	17.86	27.01	23.01	5.90
		NPSE	15.74	35.85	32.64	5.44
		CSE	NA	NA	-7.00	-7.00
17	Norway	GPSE	80.62	79.62	87.75	87.46
		NPSE	69.20	70.03	75.55	75.23
		CSE	NA	NA	-59.00	-59.00
18	Portugal	GPSE	39.23	36.54	52.84	50.25
		NPSE	35.13	34.49	49.81	41.38
		CSE	NA	NA	-44.00	-44.00
19	Spain	GPSE	39.23	36.54	52.84	50.25
		NPSE	35.13	34.49	49.81	41.38
		CSE	NA	NA	-44.00	-44.00
20	Sweden	GPSE	45.28	42.69	64.30	62.31
		NPSE	41.28	37.55	58.52	52.46
		CSE	NA	NA	-55.00	-55.00
21	Switzerland	GPSE	69.01	70.77	82.56	82.69
		NPSE	63.34	67.27	78.81	73.16
		CSE	NA	NA	-56.00	-56.00
22	Turkey	GPSE	NA	NA	NA	NA
		NPSE	NA	NA	NA	NA
		CSE	NA	NA	NA	NA
23	U.K.	GPSE	39.23	36.54	52.84	50.25
		NPSE	35.13	34.49	49.81	41.38
		CSE	NA	NA	-44.00	-44.00
24	U.S.A.	GPSE	21.37	28.49	38.47	30.80
		NPSE	20.38	33.29	42.32	28.63
		CSE	NA	NA	-21.00	-21.00