

**DETERMINANTS OF AGRICULTURAL PROTECTION IN FINLAND
(1931-1990)**

Anja CROMMELYNCK, Jukka KOLA, Johan F.M. SWINNEN

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ABSTRACT

This study analyzes the determinants of changes in Finnish agricultural protection and investigates a series of theoretical hypotheses concerning the determinants of agricultural protection. Our empirical econometric analysis uses annual data from 1931 to 1990 for 9 agricultural commodities. The results support the hypotheses that changes in agricultural protection are induced by changes in the structure of the economy which affect the distribution and the size of costs and benefits of protection. Variables that measure the impact of those changes, such as relative income in agriculture, the share of farmers in the employment, the share of food in total consumers expenditure, and the self sufficiency rate, are found to be empirically important.

JEL Classification: Q18, C52, N54

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Anja Crommelynck (researcher), Jukka Kola (Department of Economics and Management, University of Helsinki) and Johan Swinnen (director), Policy Research Group, Department of Agricultural Economics, Katholieke Universiteit Leuven, Kardinaal Mercierlaan 92, 3001 Leuven, Belgium, Tel.: ++32 16321615 - Fax: ++32 16 311996 - E-mail: jo.swinnen@agr.kuleuven.ac.be.

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1. INTRODUCTION

The Finnish government has regularly intervened in agricultural and food markets since Finland became an independent country in 1917. However, the effect of the interventions (supporting consumers or producers), the intensity of support and the range of commodities or subsectors to which the programs applied have varied substantially over time. The food crisis of 1917-18, severity of which resembled the famine years of 1860s, was the actual turning point in the development of agriculture and agricultural policy in Finland. Consequently, self-sufficiency of a sufficiently high degree was set as the primary goal of agricultural policy. Since then, one can identify several 'waves' of agricultural protectionism in Finland. A first wave of protectionism started with the economic crisis in 1928, focusing mostly on export subsidies and import restrictions. Food shortages during the Second World War and cession of territory, including important arable land to the USSR after the War, induced a policy to increase self-sufficiency, including the extension of productive land and creation of 101,000 farms of a very small size for Karelian refugees and war veterans according to the Land Acquisition Act of 1945. In the 1950s and 1960s agricultural protection increased significantly along with the development of Agricultural Income Acts since 1956. Production restrictions were introduced later as surpluses increased due to high protection in the 1970s and 1980s. In addition, while the general pattern evolved similarly for all agricultural commodities, important differences exist in their relative support levels.

This paper uses a political economy framework to explain the variation in protection between agricultural commodities and over time. Most empirical research on the political economy of agricultural subsidization/taxation is limited to the post-World War II period (Krueger, Schiff and Valdes, 1989; Honma and Hayami, 1986). In this case, much variation is lost, especially in the analysis of industrialized countries. Notable exceptions are Gardner's

(1987) widely cited study on the causes of farm policy in the United States, using long-run data, Tracy's (1989) qualitative analysis of the long-run variation in European agricultural policies and Swinnen and de Gorter's (1997) study of determinants of agricultural protection in Belgium since the 19th century. The latter studies show that many insights can be gained from a long-run analysis. Furthermore, they also show that many theoretical explanations are insufficient because of the models' bias towards explaining cross-country differences.

Our analysis studies the determinants of the variations in agricultural protection within Finland over a long time period and for different commodities. The explanatory variables are disaggregated at the commodity level as much as possible. This approach is comparable to Gardner's (1987) empirical test of hypotheses from Becker (1983), Gardner (1983) and Olson (1985) on agricultural protection in the United States. This analysis focuses primarily on factors that affect the effectiveness of collective action of different groups, including the relative size and concentration of the agricultural producers, and the deadweight costs of the policies. Our paper tests the hypotheses on the causes of agricultural protection developed theoretically in Swinnen (1994). This theory of agricultural protection stresses the importance of the changing role of agriculture and food in the general economy with economic development and changes in the relative income situation of farmers as the primary causal factors of change in agricultural protection.

The results support the hypotheses that changes in agricultural protection are induced by changes in the structure of the economy which affect the distribution and the size of costs and benefits of protection, by changes in the economic situation of agricultural producers vis-a-vis the rest of the economy. Variables that measure the impact of those changes are found to be empirically important.

2. VARIABLES AND DATA¹

Our econometric study of the determinants of protection of agricultural products uses annual data. The variables are calculated starting in 1931 because only since that year domestic farm prices can be found in a consistent series provided by the then (1932) newly established Marketing Research Institute of Pellervo-Seura (PSM). Pellervo-Seura (-Society) represents the Finnish agricultural and food industry co-operatives. Product specific parameters are calculated for 9 agricultural products: wheat, rye, barley, oats, sugar beet, potatoes, milk, beef and eggs.

2.1 Protection Indicators

The analysis uses the nominal protection coefficient (NPC) as an indicator of agricultural protection. Figure 1 shows the evolution of NPCs since 1931. The NPC is a straightforward indicator, measuring primarily price distortions, and is calculated as the ratio of domestic prices over world market prices (Tsakok, 1989). Consistent data series to calculate more sophisticated protection measures, such as producer subsidy equivalents, were unavailable. Domestic prices are taken from the PSM statistics. For a consistent proxy of world market prices, we used import (export) prices, calculated as the ratio of import (export) values over import (export) quantities, as listed in the Finnish import-export statistics. Import prices are used for products with a negative trade balance, and export prices for those products that are mostly exported. Import and export values in the statistics are based on the average import price c.i.f. and export price f.o.b.. Transport costs were unavailable for most products and time periods. For the sake of consistency, transport costs are not included in the calculations.

1 See section "Statistical sources" for references.

***** FIGURE 1 HERE *****

As figure 2 indicates, the years immediately after the First World War were generally considered good years for farmers. In contrast, the end of the 1920s and the 1930s saw strongly declining incomes because of reduced demand through the general economic crisis and increased supply resulting from large investments in agriculture in the 1920s. New, mainly very small farms were established to strengthen the small-scale family farming (and the peasant state) and to redress the unsatisfactory balance of landless and landowners (Mead, 1953). The Land Reform Acts of 1918 (*torpparilaki*) and 1922 (*Lex Kallio*) created over 100,000 small-scale freehold properties during the 1920s (Salokangas, 1987) mainly as the redemption of leasehold properties allowing inexpensive ownership to former tenant-farmers. Until 1939, 37,000 entirely new farms were established due to the Land Reforms, and arable land area increased to 2.6 million hectares from 2 million hectares in 1920.

***** FIGURE 2 HERE *****

This increase in the number of landowners naturally also affected politics and political economy of agriculture in Finland. Government policy responded to these developments. The Finnish government introduced or raised import tariffs for many agricultural commodities and introduced the compulsory use of domestic grains in mills (“compulsory mix law”). In addition, the establishment of the State Grain Storage (*Valtion viljavarasto*) and the state import monopoly for grains further secured demand for domestic grain in the 1930s (Kananen, 1984). Sugar production was already protected since 1918 through a system of minimum prices, import tariffs and production subsidies (which were raised in 1925). Animal products were protected by import tariffs and export subsidies since 1929. When the economic crisis intensified, the government introduced import laws for pork, margarine and butter in 1934, and raised tariffs (Westermarck, 1968). In addition to agricultural problems in the economic crisis, farm families were also hurt by the decline in profitability of the forest

industry leading to lower stumps prices and lower demand for timber from farms as well as for forest jobs commonly performed by small-scale farmers. All these problems and consequent government measures are reflected in high NPCs for most products (figure 1).

Agricultural prices (and incomes) improved considerably in the second part of the 1930s (Juttila, 1937), reducing the demand for agricultural protection and consequently inducing the government to lower interventions. This is reflected in declining NPCs. In jargon, between 1917 and 1939, Finland moved from food shortage to self-sufficiency with the help of the major land reforms and clearance, and protectionist support policies.

After the war, consumption of food products was tightly controlled by rationing (food coupons), which actually started already after the Winter War in 1940. In addition, both wages and prices, including agricultural prices, were regulated to alleviate inflationary pressures (Westermarck, 1968). From the mid-1950s onwards government support for farmers increased again. With wartime food shortages fresh in mind, the official objective was to support farmers in order to ensure food self-sufficiency in a strategy of international neutrality (Zetterberg, 1991).² From 1956 onwards, producer prices are regulated following the “Agricultural Income Act” intended to ensure income equality between agriculture and other sectors of economy (Kola, 1993a).³ Annual negotiations between producer associations (MTK and SLC of Finland’s Swedish-speaking farmers) and the State represented by the Ministry of Agriculture and Forestry (MAFF) lead to the determination of target prices, price subsidies, and direct income support. The resulting increase in production caused the government to reduce price supports (to production for the home market only) in 1962 (Singleton, 1986). Sugar producers were supported with

2 In 1969 an agricultural committee led by professor Samuli Suomela set the following targets for food self-sufficiency: 105% for animal products, 100% for crops, and 20% for sugar and oilseeds.

3 Pyy and Lehtola (1996) distinguish three main periods in the economic policy for rural areas: (1) the state directed policy after the First World War, with important interventions in land markets and infrastructure, (2) the income support policies through price interventions since the 1960s, and (3) the market oriented period,

compensatory payments for lower prices to sugar factories.

Structural development stagnated in the difficult post-War conditions. Karelian refugees and war veterans were offered opportunities within farming. The Land Acquisition Act of 1945 created 101,000 small farms during the next decade. As a result, the average size of farms declined to 7.9 ha in the end of 1950s and the pre-War level of average farm sizes was reached only in the 1970s. In terms of political economy, Haataja (1987) has described this post-War resettlement process as the “social policy of the agrarian society”. Agriculture, at the cost of its internal development, acted as the society’s buffer necessary for the adjustment under extremely exceptional conditions and lack of alternatives (Kola, 1993b). The necessity of the resettlement program was unavoidable, and as Mead (1953, p. 204) puts it, “... Finland has demonstrated in the international field that at least one country has made constructive and practical efforts to solve its problem of displaced people”. Inevitably, this extensive process has also influenced the political economy and formation of agricultural policy in Finland ever since, even when its direct influence has decreased significantly (Kola, 1993a).

As illustrated by figure 1, agricultural protection increased strongly in the 1970s and 1980s following the introduction of several measures. These included direct subsidies to support, and farms in less favored areas and especially smaller-scale (family) farms (Kettunen, 1981), the latter being started already in 1962 (*pinta-alalisä*) and it lasted until 1995. Most animal products were further supported by consumption subsidies in the form of tax relieves for food processing firms for purchasing agricultural raw material and e.g. additional price for milk in 1974, which was financed from the state budget in order to restrain inflationary pressures, export subsidies, and import quotas, licenses and tariffs. This increased support stimulated production, and thereby financial pressures on the system.

before and after accession to the EU.

Some limits on export subsidies were introduced, farmers' share of export costs was increased, and production quotas were introduced for milk and eggs in 1985-1986 as mandatory production restriction. In voluntary measures, the government made contracts with farmers where they were compensated for completely quitting agricultural production or reducing partly the production of milk, eggs and pig meat.

A generalized illustration of the evolution in agriculture and agricultural policy in Finland since its declaration of independence on December 1917 is provided below:

1920s: major land reforms to redress the problem of landless rural people. Increasing production.

1930s: the first half of economic problems, the second half of improved economic and production conditions

1940s: War years with declining production, food shortage and food consumption rationing. Resettlement of Karelian refugees by the Land Acquisition Act of 1945, structural development halted.

1950s: production increase through price and income development (the first Agricultural Income Act in 1956) and structural policy (though of a negative impact in the long run due to numerous, new small farms that were created in the resettlement process)

1960s: price and income policy; parity principle; stabilization of policy; growing over-production

1970s: the first era of (voluntary) production restrictions; structural policy to secure family farms; social policy for farmers

1980s: the second era of (mandatory) production restrictions; price support freeze and increased direct support (late 1980s), farmers' increasing responsibility in export costs of excess supplies

1990s: heavy state intervention continued, but growing pressures to cut total farm support, and enhance favorable structural development and market signals

1995: EU membership and application of the CAP. Major changes (e.g. average price drop of 40%) and regional differences in agricultural production possibilities and income formation

2.2 Explanatory variables ⁴

The choice of the explanatory variables is based on Swinnen's (1994) political economy theory of agricultural protection. Data for the calculation of the explanatory variables are from publications of the Finnish Central Statistical Office (Tilastokeskus), the Agricultural Economics Research Institute (MTTL), the Marketing Research Institute (PSM) and from OECD (see appendix).

Average relative income developments are illustrated by the ratio of value added per capita in agriculture over industry, adjusted for non-farm incomes, in figure 2. This ratio indicates that only after the two World Wars income in agriculture was close to income in industry. According to this measure, relative incomes have been fairly stable since 1955. Pyy and Lehtola (1996) argue that a better income indicator shows that the government's strong support for agriculture since the 1960s has caused a considerable reduction of the income gap (see figure 3), but that agricultural income is still lower. Puurunen (1990) furthermore shows that the relative income position differs very strongly within agriculture between subsectors.

*** **FIGURE 3 HERE** ***

There are two problems with these income indicators for our analysis. First, these

indicators themselves are heavily influenced by government support for agriculture, creating a bi-causality problem. Second, commodity specific information on producer incomes are unavailable. For both reasons, we use the world market price of the commodity, deflated by the consumer price index (ADJWP) as an indicator for exogenous, i.e. pre-policy, relative income developments of the commodities' producers vis-à-vis the rest of the economy.

Agricultural protection is expected to increase as incomes in agriculture fall relative to the incomes in the rest of the economy. A fall in income of farmers relative to industrial incomes increases the marginal utility of income of farmers. Governments can increase their political support by exploiting this difference in forthcoming marginal political support through increasing agricultural protection when agricultural income is falling in relative terms (de Gorter and Tsur, 1991). Swinnen and de Gorter (1993) have called this relative income effect the "altruistic" side of "self-interested" governments.

GNPSHARE measures the share of a commodity's output in total GNP. This variable reflects two opposing factors. First, *ceteris paribus*, sectoral protection will increase as the share of the sector in total output declines because with a decline in the share of the sector's output in the economy, the tax base (the other sectors' output) increases relative to the total expenditures for a given level of per capita transfer. This reduces the tax rate that is required to finance both the transfer and the accompanying social costs. This reduction in the required tax rate benefits all taxpayers and, hence, reduces the loss in political support per unit of transfer. Moreover, the per capita benefit of the transfer to the protected sector increases and so will political support from this sector. Second, protection is expected to be higher for agricultural commodities that use more fixed production factors in the production process. An increase in the amount of fixed production factors in the sector will increase the political pressure to support the owners of the factors, as more fixed production factors are affected.

4 See Swinnen (1994) and Swinnen and de Gorter (1993) for formal derivations of the hypotheses in this

Further, an increase in industrial capital intensity reduces the share of labor in total production costs, and, hence, reduces the impact of the inflationary effect of food price increases on wages. This will mitigate the opposition of industrialists to agricultural protection.⁵

The first effect would imply a negative sign for the coefficient of GNPSHARE, while the second effect would explain a positive sign for GNPSHARE. It is empirically difficult to separate both effects because the amount of fixed resources is, across products, highly correlated with the value of the production.

Table 2 shows that the share of agriculture in total output has declined from around 30% in 1900 to less than 5% in 1990. Within agriculture an important restructuring took place over the past century (table 3). The import of cheap Russian grain at the end of the 19th century induced grain prices to collapse and has on a more permanent basis induced farmers to shift to animal production.⁶

***** TABLE 2 & 3 HERE *****

CONSHARE measures the share of the commodity in consumer expenditures. It is expected to have a negative impact on protection: protection to a sector is lower when the expenditure share of the sector's product in total consumer expenditures is more important. For example, an import tariff to protect a sector will increase prices and government

section.

⁵ This inflationary effect of agricultural price increases arrives through the demand side of the labor market. A second inflationary effect through an increase in the cost of living of workers is captured by CONSHARE (see further).

⁶ The dramatic fall in grain prices on the world market after 1875 was caused by a combination of factors: a dramatic increase in cheap grain exports from Canada, the United States, Argentina and Russia due to (1) the expansion of agricultural production, especially in the United States where land was abundant and cheap, and (2) technological innovations, such as agricultural machinery, which allowed for the exploitation of vast areas, and the steam boat, which dramatically decreased international transport costs (Tracy, 1989).

revenues. In a small open economy, the loss for consumers due to increased consumer prices is partly offset by the gain in revenue due to the distribution of tariff revenues. The proportion of this offsetting gain is the same for all individuals if each individual's share in tax revenues is the same as his/her share in consumption. However, often this is not the case. For example, for the poorest people in society the share of basic foodstuff is higher than their share in total government revenues, including those obtained from the tariff. Most output of agricultural production is food products, which itself is a heterogeneous group of products. Some of the products are staple foods, while others are more luxury products, with a higher income elasticity. This income elasticity itself declines as the economy grows and the lowest incomes increase. In addition, as an economy grows, value added for food products increases, with the resulting increase in processing and distribution margin reducing the share of the raw agricultural material in the final price for food. Therefore, 'poor' people, experiencing small marginal income tax rates and few government benefits and having a higher than average marginal propensity to consume (staple) food, will oppose import tariffs more vigorously than 'rich' people. However, this resistance decreases when the share of food expenditures in total income declines.

Table 4 shows that the share of food in total consumer expenditures was fairly stable (between 50%-60%) over the period 1900-1920. Afterwards it declined slowly, but was still around 40% in 1950. After 1950 it decreased to less than 20% now. However, the aggregate numbers do not fully reflect the change in food expenditures. Table 4 shows how the share of bread grains in total consumer expenditures declined from 20% in 1900 to less than 5%. The other main staple food, potatoes, declined over the same period as well. Expenditures on beef, pork and milk are much more stable.⁷

⁷ See Rouhiainen (1979) for a more detailed study on food expenditures between 1950-1975.

***** TABLE 4 HERE *****

RPOP is defined as the share of agricultural employment in total employment. Protection is expected to increase to a sector with decreasing employment shares. As the number of individuals to be subsidized in a sector decreases relative to that of another sector, there are relatively more taxpayers. For a given per capita transfer to the protected sector, the per capita tax on the rest of the economy decreases. This reduces each individual's opposition against protection. However, there are now relatively more people who are taxed and fewer who benefit by the protectionist policy. The combined impact is determined by the differential impact due to the concavity of the utility and support function, which implies that the per capita transfer to the protected sector unambiguously increases (Swinnen and de Gorter, 1993). Collective action models emphasize this factor for a different reason. They attribute the increase in agricultural protection importantly to the increased ability of farmers to organize politically as their numbers decline, and hence, free-riding problems become less important (Olson, 1985).

There are no data to disaggregate employment by commodity. Agricultural employment in Finland declined from 75% of the total active population in 1900 to 45% by 1945 (table 2). Based on that indicator, Finland was still a very agrarian society at the eve of the second World War. After 1950 the share of farmers in total employment fell rapidly, but the share of agriculture in total employment in 1990 is still high by EU standards.

SSR is the self-sufficiency ratio measured as the ratio of domestic production over consumption. Protection of a sector is expected to decrease with the degree of self-sufficiency of the sector's product. Large food importers will experience a terms of trade improvement due to protectionist policies. This effect diminishes as the degree of self-sufficiency increases. People in a food exporting country will experience an additional

marginal decrease in their real disposable income due to a negative terms of trade effect. This will reduce the increase in political support from the producers, while the decrease in support from the consumers and taxpayers will be larger.

Finland has historically been an importer for many crops (especially sugar and oilseeds), while exporting dairy products. Table 5 shows how the self-sufficiency ratio of all commodities has increased over time, as protection to domestic farmers increased.

***** TABLE 5 HERE *****

A dummy variable is used to capture the effect of political party influences on Finnish agricultural policy. Farmers, and especially small-scale family farmers, are argued to have been successful in securing high protection because of their association with the Agrarian Party. This party has often been the strongest party in parliament (Table 6) and participated in 23 out of 25 post World War II governments. Three Agrarian Party members became President (Relander 1925-32, Kallio 1937-40 and Kekkonen 1956-81). Andren (1964) and Singleton (1986) argue that this central political position of the Agrarian Party has had a positive effect on agricultural protection, and that especially during the periods when Agrarian Party members held the presidency (e.g. under the Kekkonen regime) that agricultural protection increased rapidly. AGPRES measures the influence of having an Agrarian Party president (AGPRES=1 for years that the president was an Agrarian Party member and 0 in other years).

***** TABLE 6 HERE *****

In addition, product dummies (DBAR, DRYE, DOAT, DPOT, DSUG, DMIL, DCAT, DEGG) are used to capture product specific effects that are not explained by the previous variables.

3. REGRESSION RESULTS

Table 7 presents the least squares regression results, after testing for endogeneity of the explanatory variables and the optimal lag structure ⁸. The estimated coefficients are consistent with the theoretical hypotheses. The world market price ADJWP is highly significant and has an important negative impact: agricultural protection increases when world market prices fall. This result is consistent with the “relative income hypothesis” of Swinnen and de Gorter (1993), and de Gorter and Tsur (1991); and with the “compensation effect” in Magee, Brock and Young (1989), and the “countercyclical transfers” of Bullock (1992).

*** TABLE 7 HERE ***

The share of agriculture in employment (RPOP) is negatively correlated with NPC. The high t-value of RPOP suggests that especially the decline in farm employment after the Second World War has stimulated protection. With less farmers to subsidize, the per capita tax on the rest of society declines, and the opposition reduces, as do the farmers costs of collective action.

The negative coefficient of CONSHARE reflects the declining opposition from consumers when they spend a smaller share of their income on the product. Policy-induced

⁸ All independent variables were tested for endogeneity, i.e. was tested whether they depend on or are caused by the dependent variable of previous time periods. This was done using the Granger Test for causality. In order to account for potential autocorrelation, different specifications were tested (specifications based on lagged variables). The results of this test indicate no endogeneity of the independent variables.

price increases of products which have less impact on consumer welfare are likely to meet less opposition. This result is also consistent with empirical evidence from recent agricultural policy developments in Central and Eastern Europe (Swinnen, 1996).

The positive sign of the coefficient of GNPSHARE indicates that the size of the 'vested interest', represented by the amount of fixed resources, is positively related with the level of protection. This result is consistent with Swinnen and de Gorter's (1997) long run analysis of agricultural protection in Belgium, but quite different from other econometric analyses that typically indicate a negative correlation between the size of the agricultural sector and agricultural protection. This negative correlation may be due to specification errors of other models that omit important variables (e.g. share in consumer expenditures) or are insufficiently disaggregated.

The self-sufficiency ratio (SSR) has also a negative impact on the NPC, consistent with theory predictions. Protection declines with increasing self-sufficiency as it increased distortions and costs, *ceteris paribus*.

That part of the variation that is captured by the product dummy variables and which cannot be attributed to the other variables, is unexplained by our econometric model. There is some important unexplained variation in the protection of sugar beet and especially potato (-3.13) production. A number of potential explanations that are not included in our estimation are:

1. *the importance of supply elasticities* : larger supply elasticities increase deadweight costs per unit of subsidy or tariff (Gardner, 1987; de Gorter and Tsur, 1991; Swinnen, 1994). It was impossible to find or calculate consistent values for this variable over our time period for most products. The differences in protection between grains and, for example, egg production can probably be partly attributed to this variable;

2. *the degree of commercialization*: products such as sugar beet (sugar), milk (butter) and grains are much more commercialized, either as raw products or as processed foods;
3. *the perishability of the product*: products as sugar, butter and grains can be stored easier and longer than products such as potatoes. This increases the options for the government to intervene in the market and to impose e.g. floor prices;
4. *degree of tradeability*: it is impossible to levy tariffs or give export subsidies if the product is not traded. To some extent the degree of commercialization, perishability and tradeability are correlated and may reflect the same biological product characteristics. For example, potatoes were hard to store because of their moisture content, were often not traded and until fairly recently not processed on a large scale. Hence most market interventions and trade measures could not be applied to support those products;
5. *concentration of the processing industry*: a higher concentration of the processing industry increases the political organization of the processors and might therefore increase the prices for processed products. However, this factor might be offset by the increasing monopsonistic structure, which tends to decrease raw material prices.

In conclusion, potato production receives typically lower price support because of policy implementation problems for a product with high perishability, and the positive coefficient of DSUG may be due to the concentrated sugar processing industry which improves both its effective lobbying power and lowers the costs of subsidy administration.

The second model in table 7 includes the Agrarian Party president variable (AGPRES). The coefficient of AGPRES has a negative sign. This is inconsistent with Singleton's argument and implies that, *ceteris paribus*, under the presidency of an Agrarian Party member agricultural protection (at least that part which is measured by the NPC) is lower. From table 1 and figure 1 one can see that agricultural protection has increased very strongly in the 1980s, which is after the Kekkonen presidency ended. Furthermore, this result is not

due to problems of collinearity with other variables. Comparing the two models in table 7 shows that the coefficient estimates of the other explanatory variables are robust. All this suggests that either the influence of the President on agricultural policy has been exaggerated or that the influence of the Agrarian/Center Party in government was sufficiently strong to (more than) offset potential presidential influence on agricultural policy when other parties held the presidency. As a whole, instead of the party of the President, changes in government coalitions are more likely to affect the contents and form of (agricultural) policies. The Agrarian/Center Party, representing effectively the agricultural and rural interests, has played a key role in the Finnish politics, and its size and political power have been much bigger than those of agrarian/centrist parties in the other Nordic countries (Kola, 1993a; Lindahl, 1995). In addition, especially between 1966 and 1987 the consensus policy led by the Center Party and the Social-Democratic Party together allowed high agricultural support along with corresponding social and job security benefits to other groups in the economy. Major restructuring of the Scandinavian-style welfare state and so-called gained benefits - both in agriculture and other sectors of the Finnish economy - started during the economic recession of the early 1990s and still continues due to EU membership, the EMU process, and global trade liberalization as well as overall internalization.

4. CONCLUSION

A quantitative empirical analysis of the determinants of agricultural protection, based on Finnish annual data from 1931 onwards, yields results that are consistent with theoretical hypotheses from Swinnen (1994). The analysis shows that a fall in agricultural income relative to incomes in the rest of the economy increases protection, while a relative increase reduces agricultural protection. Further, protection is negatively related with the share of the product in consumer expenditures, with the self-sufficiency ratio, and with the share of farmers in total employment. Further, the size of the sector, reflecting the size of fixed production factors and hence the size of the 'political demand' is positively related with the level of protection.

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Table 1. Average Nominal Protection Coefficients (NPCs)

| | Wheat | Rye | Barley | Oats | Potatoes | Sugarbeet | Eggs | Milk | Beef |
|-----------|-------|------|--------|------|----------|-----------|------|------|------|
| 1931-1940 | 1.59 | 1.70 | 0.97 | 1.17 | 1.29 | 3.19 | 0.96 | 1.37 | 0.15 |
| 1941-1950 | 0.97 | 1.04 | 0.98 | 0.66 | 0.46 | 2.54 | 0.88 | 1.24 | 0.16 |
| 1951-1960 | 1.62 | 1.97 | 1.14 | 1.25 | 0.58 | 3.53 | 1.42 | 1.75 | 1.68 |
| 1961-1970 | 2.03 | 2.40 | 1.48 | 1.00 | 0.44 | 4.82 | 1.85 | 2.38 | 1.49 |
| 1971-1980 | 1.56 | 1.99 | 1.01 | 0.77 | 0.67 | 3.05 | 2.71 | 3.07 | 2.16 |
| 1981-1990 | 2.79 | 4.15 | 2.38 | 3.77 | 1.25 | 6.25 | 3.67 | 4.16 | 2.06 |

Table 2. Share of Agriculture in Population, Total Output and of Food in Total Expenditures

| | % Agricultural Population | % Food Expenditures | % Share of Agriculture in Total Output (*) |
|------|------------------------------|------------------------|---|
| 1900 | 70.5 | 56.8 | 29.2 |
| 1910 | 67.9 | 54.7 | 26.1 |
| 1920 | 59.8 | 53.6 | 33.1 |
| 1930 | 52.6 | 43.5 | 22.0 |
| 1940 | 40.7 | 43.5 | 23.3 |
| 1950 | 39.0 | 40.6 | 21.4 |
| 1960 | 34.0 | 33.9 | 15.5 |
| 1970 | 25.9 | 26.1 | 9.0 |
| 1980 | 16.4 | 20.7 | 7.9 |
| 1990 | 11.6 | 15.2 | 5.3 |

(*) Gross value added at factor costs

Table 3. Average Share in GDP (%)

| | Wheat | Rye | Barley | Oats | Potatoes | Sugarbeet | Eggs | Milk | Beef |
|-----------|-------|------|--------|------|----------|-----------|------|-------|-------|
| 1931-1940 | 1.22 | 2.75 | 1.12 | 3.55 | 2.46 | 0.13 | 0.81 | 9.80 | 4.43 |
| 1941-1950 | 1.15 | 1.06 | 0.77 | 1.93 | 2.09 | 0.15 | 0.64 | 8.62 | 4.64 |
| 1951-1960 | 0.85 | 0.58 | 0.87 | 2.09 | 1.23 | 0.21 | 0.66 | 10.87 | 37.02 |
| 1961-1970 | 1.04 | 0.31 | 0.82 | 1.31 | 0.56 | 0.20 | 0.57 | 9.21 | 28.80 |
| 1971-1980 | 0.39 | 0.11 | 0.88 | 0.78 | 0.37 | 0.13 | 0.45 | 5.53 | 20.46 |
| 1981-1990 | 0.33 | 0.08 | 0.86 | 0.60 | 0.33 | 0.13 | 0.26 | 1.25 | 12.63 |

Table 4. Average Food Expenditures as Share of Total Consumer Expenditures (%).

| | Food | Grains | Potatoes | Sugar | Eggs | Milk | Meat |
|-----------|-------|--------|----------|-------|------|------|------|
| 1900-1910 | 55.52 | 19.27 | 2.55 | 4.55 | 0.67 | 7.24 | 7.41 |
| 1911-1920 | 54.07 | 16.39 | 3.03 | 4.04 | 0.82 | 8.04 | 7.96 |
| 1921-1930 | 48.67 | 14.03 | 1.97 | 4.44 | 0.63 | 8.42 | 6.48 |
| 1931-1940 | 42.59 | 11.49 | 1.62 | 4.44 | 0.59 | 7.06 | 5.46 |
| 1941-1950 | 44.02 | 7.58 | 2.34 | 3.30 | 1.26 | 7.05 | 7.62 |
| 1951-1960 | 36.92 | 6.34 | 0.94 | 3.65 | 0.95 | 5.17 | 6.07 |
| 1961-1970 | 29.51 | 5.01 | 0.58 | 2.74 | 0.72 | 4.35 | 6.06 |
| 1971-1980 | 23.15 | 3.25 | 0.49 | 1.81 | 0.49 | 3.22 | 5.98 |
| 1981-1990 | 18.37 | 2.95 | 0.49 | 0.99 | 0.35 | 2.19 | 4.31 |

Table 5. Average Self - Sufficiency Ratios (in %)

| | Wheat | Rye | Barley | Oats | Potatoes | Sugarbeet | Eggs | Milk | Beef |
|-----------|-------|-----|--------|------|----------|-----------|------|------|------|
| 1931-1940 | 45 | 86 | 106 | 107 | 83 | 19 | 178 | 103 | 100 |
| 1941-1950 | 65 | 59 | 93 | 67 | 75 | 24 | 96 | 76 | 99 |
| 1951-1960 | 45 | 60 | 110 | 104 | 104 | 18 | 109 | 122 | 100 |
| 1961-1970 | 91 | 77 | 99 | 101 | 100 | 25 | 128 | 100 | 100 |

| | | | | | | | | | |
|-----------|----|----|-----|-----|----|----|-----|-----|-----|
| 1971-1980 | 95 | 78 | 12 | 105 | 97 | 42 | 152 | 101 | 102 |
| 1981-1990 | 93 | 87 | 112 | 121 | 93 | 63 | 149 | 103 | 114 |

Table 6. Political parties and their seats in the Parliament 1945-95 in Finland

| <i>Year</i> | <i>Agrarian / Centre Party</i> <i>KESK</i> | <i>Conservative Party</i> <i>KOK</i> | <i>Social Democrats</i> <i>SDP</i> | <i>Communists</i> <i>VAS.L</i> | <i>Swedish Party</i> <i>RKP</i> | <i>Liberal Party</i> <i>LKP</i> | <i>Rural Party</i> <i>SMP</i> | <i>Christian Party</i> <i>SKL</i> | <i>Green Party</i> <i>VIHR</i> | <i>Others</i> |
|-------------|---|---|---------------------------------------|-----------------------------------|------------------------------------|------------------------------------|----------------------------------|--------------------------------------|-----------------------------------|---------------|
| 1945 | 49 | 28 | 50 | 49 | 14 | 9 | | | | 1 |
| 1948 | 56 | 33 | 54 | 38 | 14 | 5 | | | | 0 |
| 1951 | 51 | 28 | 53 | 43 | 15 | 10 | | | | 0 |
| 1954 | 53 | 24 | 54 | 43 | 13 | 13 | | | | 0 |
| 1958 | 48 | 29 | 48 | 50 | 14 | 8 | | | | 3 |
| 1962 | 53 | 32 | 38 | 47 | 14 | 13 | | | | 3 |
| 1966 | 49 | 26 | 55 | 41 | 12 | 9 | 1 | | | 7 |
| 1970 | 36 | 37 | 52 | 36 | 12 | 8 | 18 | 1 | | 0 |
| 1972 | 35 | 34 | 55 | 37 | 10 | 7 | 18 | 4 | | 0 |
| 1975 | 39 | 35 | 54 | 40 | 10 | 9 | 2 | 9 | | 2 |
| 1979 | 36 | 47 | 52 | 35 | 9 | 4 | 7 | 9 | | 1 |
| 1983 | 38 | 44 | 57 | 26 | 10 | | 17 | 3 | | 5 |
| 1987 | 40 | 53 | 56 | 20 | 12 | | 9 | 5 | 4 | 1 |
| 1991 | 55 | 40 | 48 | 19 | 11 | 1 | 7 | 8 | 10 | 1 |
| 1995 | 44 | 39 | 63 | 22 | 11 | | 1 | 7 | 9 | 4 |

Table 7. Estimation Results

| | | | | |
|---------------------|---------------------|-----------------|---------------------|-----------------|
| Depend. Var. : | NPC | | NPC | |
| Observ. (#) : | 496 | | 496 | |
| Adj. R ² | 0.828 | | 0.832 | |
| | <i>Coefficients</i> | <i>t-values</i> | <i>Coefficients</i> | <i>t-values</i> |
| INTERCEPT | 5.018 | 6.522 | 5.107 | 7.010 |
| ADJWP | -0.139 | -8.127 | -0.139 | -8.232 |
| RPOP | -0.043 | -4.523 | -0.047 | -5.267 |
| CONSHARE | -8.740 | -2.154 | -7.937 | -2.052 |
| SSR | -0.002 | -1.494 | -0.002 | -1.306 |
| GNPSHARE | 0.019 | 1.269 | 0.021 | 1.461 |
| AGPRES | | | -0.301 | -3.355 |
| DRYE | -0.236 | -0.403 | -0.175 | -0.322 |
| DBAR | -1.910 | -2.296 | -1.781 | -2.268 |
| DOAT | -1.443 | -1.710 | -1.354 | -1.699 |
| DPOT | -2.607 | -3.131 | -2.465 | -3.135 |
| DSUG | 0.483 | 0.609 | 0.623 | 0.832 |
| DEGG | -0.237 | -0.280 | -0.122 | -0.153 |
| DMIL | -0.658 | -0.904 | -0.568 | -0.830 |
| DCAT | -0.446 | -0.572 | -0.412 | -0.560 |
| AR1 | 0.764 | 24.973 | 0.743 | 23.746 |

Figure 1. Evolution of nominal protection coefficient (NPC) for several agricultural commodities (1931-1990)

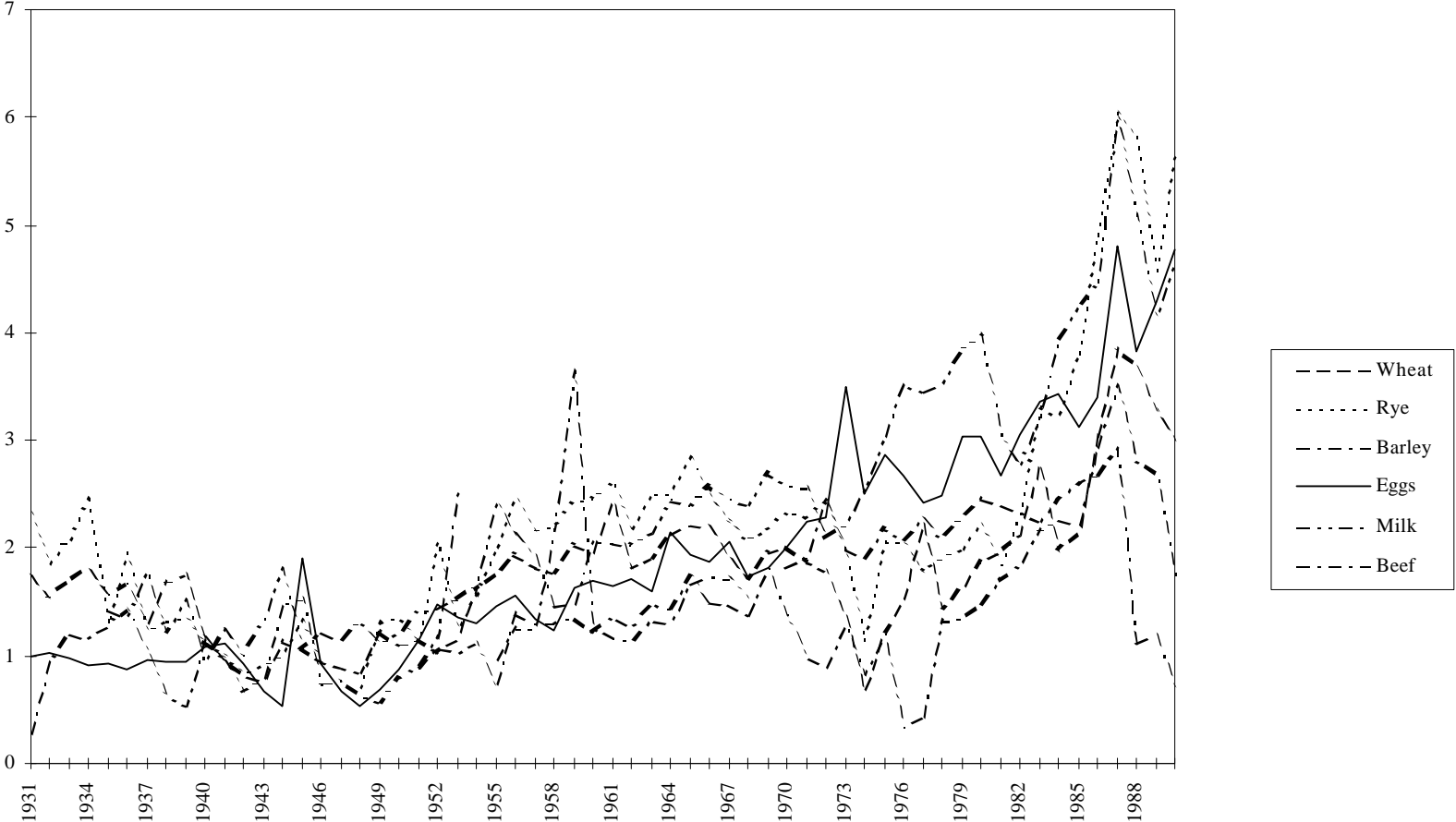
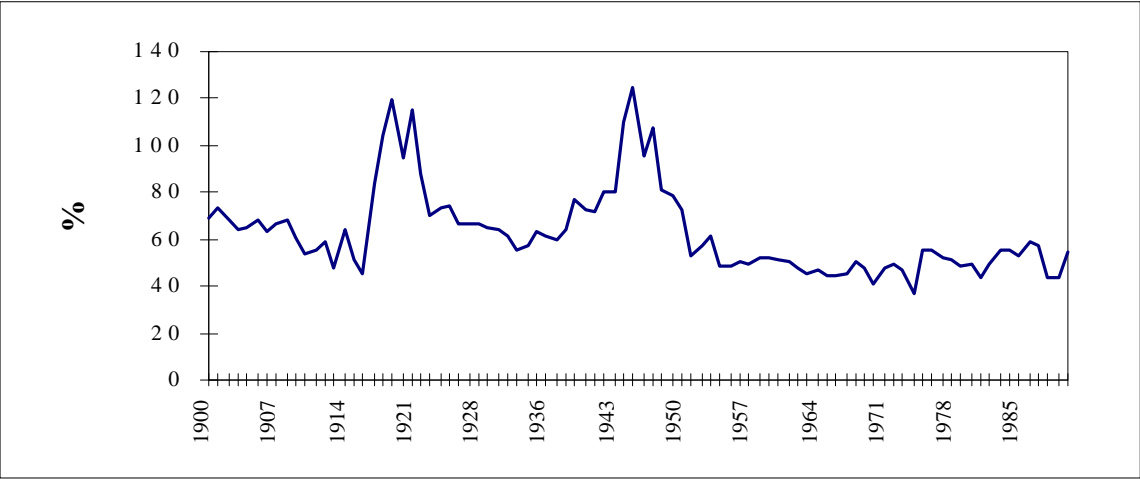
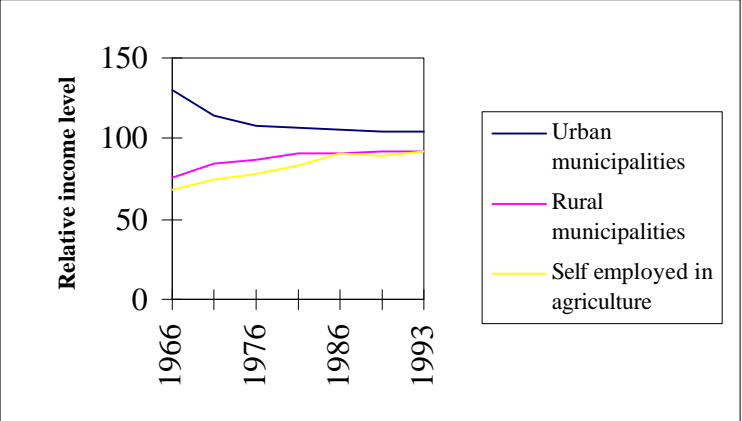


Figure 2. Ratio of per capita value added in agriculture and in industry, adjusted for off-farm incomes* (in %)



* See appendix for details

Figure 3. Relative income of Finnish households (average = 100)



Source: Pyy and Lehtola (1996)