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Introduction

The University of Arizona and Stanford University have been involved in an economic policy research and training project in Portugal since 1981. This project is part of a larger, joint U.S. - Portugal agricultural development program known by the acronym, PROCALFER. I consider myself fortunate to be associated with this effort and with the fine team of Portuguese and U.S. scholars working on the project. We have had, at least for me, the unique opportunity to conduct analysis and training on an evolving policy issue, viz., Portuguese agriculture and the European Community (EC). When we started our work, there were many doubts and doubters concerning Portugal's entry into the Common Market. Now, entry is virtually assured with the EC Council of Ministers' vote in June and the expected January 1986 beginning of the transition period.

Because it is impossible to summarize five years of work in a few minutes, I want to concentrate on three topics this morning: (1) the issues, (2) the method of analysis and (3) the implications of EC membership for the dairy industry in northwest Portugal. For those who want more details about our work, there is a handout that contains two chapters from our recent comprehensive report --- one on the method and the other containing conclusions and implications. Also included is a list of 26 reports and publications covering all aspects of the

research effort.

Issues

In the course of our work three sets of issues stood out as Portuguese agricultural policy makers grappled with how best to rationalize existing policies with the dual goals of improving agricultural performance and preparing for accession to the EC.

Set one involves the following questions: What is the current private profitability of various Portuguese agricultural systems and how might agricultural incomes change under anticipated EC price levels for commodities and inputs? Which commodity systems will become more or less profitable under the Common Agricultural Policy (CAP)? Does there appear to be any marked regional difference in the impact of the expected profitability changes? Will the more technically advanced farming systems survive and prosper relative to the traditional systems? In view of these projected patterns of profitability, what adjustments might be required within or across farming systems and regions?

Set two of the issues includes the following: What are the existing and likely patterns of social profitability or efficiency? In which commodities, technologies, and regions does and will Portugal show a comparative advantage? How does EC membership affect the valuation of outputs and inputs and hence the direction of Portuguese policy? What effects will dynamic changes have on the efficiency of Portuguese agriculture as measured by social costs and benefits?

Issues in set three comprises the following questions: How might Portugal anticipate membership in the pre-accession period, and what transitional arrangements are desirable? With accession scheduled to begin in January 1986, the pre-accession issues and the nature of the transitional arrangements are largely mute at this point.

Of current interest are the following:

What should Portugal's attitude be toward the EC and the CAP once it becomes a member of the Community? How might Portuguese domestic prices be affected by agricultural (green) exchange rate policy including green rates? How can negative impacts of EC accession be offset by the use of residual Portuguese policy instruments or by EC structural aids?

Within the broad framework of profitability analysis and the general issues stated above, the specific issues of Portuguese agricultural policy fit into eight catagories that can only be listed because of the time constraint.

1. Price levels - EC vs. Portuguese control.
2. Subsidy system - elimination of subsidies on most products and inputs but not on factors.
3. Marketing systems - elimination of state monopolies and the creation of agencies to implement the CAP.
4. Budget transfers - possibility of net transfers from Portugal to the EC on agricultural trade and market support.
5. Structural aids - use of EC funding for structural improvements in production and marketing.

6. Transition mechanisms - pace of adoption of EC price levels and the phasing out or modifying of subsidy policies.

7. Technical change - paths and prospects for farm-level technical changes.

8. Policy linkages - agricultural and macroeconomic policy interactions.

All of these issues involve complex interactions among existing and expected Portuguese and EC policies and programs. Analysis of these issues requires a general methodology that can accommodate a variety of policy parameters within a dynamic framework.

Method of Analysis

The methodology underlying most of our work on Portuguese and EC policies requires the development of accounting matrices for efficiency and policy analyses of the principal agricultural systems. This method simultaneously provides empirical results that address all three of the basic analytical issues --- private profitability, social profitability, and net policy effects. The method requires costs and returns data for agricultural systems in actual market (private) prices and in efficiency (social) prices and provides measures of agricultural income (private profitability), efficient growth of national income (social profitability), and the individual and aggregate effects of policies influencing agricultural outputs, tradable inputs, and domestic factors of production (net policy effects). It is important to remember that the social prices used in the study

are current and expected EC prices, not world market prices. This approach was used because of our concern about efficiency within the EC and the accomodation of Portuguese agriculture to EC price regulations.

The measures of social profitability are indicators of the ability of the agricultural system to compete without any support from policy and hence of comparative advantage within the EC. Our study used three alternative definitions of comparative advantage, subject to the availability of information. Projections of static comparative advantage require the assumption that all social prices (product, input and factor) and technologies do not change with the passage of time. Forecasts of projected comparative advantage include assumptions about future change in social prices during the transition to full EC membership. Estimates of dynamic comparative advantage incorporate future changes in social prices and in technologies.

Since the method was applied for a 1983 base year and a 10-year transition period (1986-96), the data requirements were enormous. Actual and projected prices and costs were developed for 33 commodity systems. Sensitivity analysis was used to investigate alternative scenarios about future social product prices (EC prices after accession), relative factor prices, and projected technologies.

A detailed discussion of the method is contained in Chapter 2 of the handout. The macroeconomic, commodity and factor market assumptions; actual and projected prices; technical coefficients; and the results of the analysis for the 33 commodity and 6 whole-

farm systems are contained in the May 1985 report. A summary of the proftability results is contained in Table 1. [Distributed T. 1 at the beginning.]

The Northwest Dairy Industry - Results and Implications

A quick review of the results in Table 1 shows that commodity systems in two regions of Portugal will suffer considerably under the projected EC policy set: the poor-soil wheat and pasture-based meat systems in the Alentejo and the milk, corn and traditional wine systems in the Northwest. Only the Northwest milk systems will be discussed at this time. Perhaps, some of the other systems and regions can be considered during the discussion period.

In order to more realistically portray technological variations and changes in the Northwest, whole-farm systems were developed and analyzed. The characteristics of the whole-farm systems for milk are contained in Table 2. [Distribute T. 2 at the beginning.] Variations in yields provide an indication of the differences in technology across systems. The associated variations in input use that explain the yeild variations are not contained in the table. For example, greater uses of fertilizer and limestone as well as the switch from traditional to hybrid varieties are associated with the higher corn yields. Milk yields increase on the larger farms as a result of better quality cows and higher feed inputs. Potato yields vary in accordance with seed quality and fertilizer use. Substitutuion among factors of production, an important aspect of technical change,

is represented by different labor-capital combinations. For example, the traditonal general farm uses animal traction and large amounts of labor per hectare. In contrast, the large milk farm has two tractors, a full complement of machinery, and uses much less labor (1/39th) per hectare.

The four whole-farm milk systems describe one path of technical change that is occuring in Northwest Portugal: traditonal general to small milk to medium milk to large milk. The economic incentives for change are reflected in the estimates of private profitability in Table 2. The constraints on change were identified by studying the land and capital requirements of each farm system and by considering the availability of managerial skills. In general, it is much easier, within the organized milkshed, to go from traditional general to small milk than to move into the medium-and large-milk farms. Land, capital and management constraints all inhibit efforts to increase size beyond what is represented by the small-milk farm.

Social profitability and the net effects of the 1983 policy set also were estimated for each whole-farm system (Table 2). These estimates show the high level of subsidization associated with milk production in Northwest Portugal. Also, the per hectare value of the net subsidy increases with farm size, giving some indication of the distributional impacts of government policies in 1983. For the traditional general and small milk systems, the level of subsidization was not sufficient to make these systems privately profitable.

The future of milk production in the Northwest appears to be even more problematic. The forecasts of whole-farm profitability for 1987, 1991 and 1996 are all negative. Both private and social returns are negative, and private losses increase in each period. Imagine two sets of long-run and short-run average cost curves. The first set represents Portuguese policy in 1983 and shows the subsidized average price at a level that yields good returns to medium- and large-milk producers, and allows small-milk producers to survive if they accept less than full opportunity costs for their family labor. The second set represents expected CAP and Portuguese policies after 1986. Milk production costs increase primarily because of higher feed grain prices under the CAP, the elimination of subsidies on fertilizer and capital, and a general increase in labor costs. In addition, the real price of milk falls by about two percent between 1983 and 1996. Consequently, a classic cost-price squeeze situation emerges that will force major adjustments in Northwest Portuguese agriculture.

Against this background, the possibilities for agricultural policies to ameliorate the problems created by the anticipated cost-price squeeze appear extremely limited. Under the CAP, decisions on product prices shift from Lisbon to Brussels. The ability of Portugal, as a small, new member state, to influence CAP prices and protect producer incomes will be limited. Furthermore, the level of transfers required to maintain milk-producer incomes is extremely large. The possibilities for import substitution in feed grain production are not optomistic

given the expected decline in the profitability of corn production in the Northwest---the major corn producing region in Portugal.

Given these conditions, what is likely to occur in the Northwest dairy industry? Among milk producers, movement toward the medium - milk technology appears likely. However, additional cost saving or output increasing innovations will be required to make the medium - milk system profitable. Similar adjustments will occur among some large-milk producers.

Unfortunately, medium - and large-milk producers represent only a small proportion of the farmers in the Northwest. A rough estimate based on the 1979 agricultural census indicates that about one percent of the farms in the Northwest belong to the medium - and large-milk category. The vast majority of Northwest farms fall in the traditional general, small milk and small wine categories. Given the pessimistic future for these farm types, small farmers in the Northwest face a number of difficult options. Many farmers, especially the elderly and single females, will choose to take lower returns on their labor and stay in farming. Their poverty will increase, but their options are limited.

Another group, consisting primarily of young men and some young women, will follow the traditional pattern of the North and seek to migrate. In addition to the push factors, their decisions to migrate will be strongly influenced by general economic conditions and job opportunities in Portugal, the rest of Europe, Brazil, and North America.

If technical innovation and migration occur, further consolidation of land will take place through transfer of ownership or rental as some milk producers seek to expand their operations. However, unless the profitability situation changes remarkably, consolidation and expansion are likely to occur at a slow pace and only in areas with the most favorable conditions for milk production, i.e., the flat valley floors and the coastal zone.

Two other groups --- nonfarm rural residents and the retired --- are marginally involved in milk production. Both of these groups contain a number of part-time farmers. The wives and children of many males who have nonfarm jobs operate small plots of land. These plots provide food for the household and some income from milk and other products. As social and economic conditions change, the importance of this group as producers of marketed surpluses is likely to decline. The children of these households are better educated, and many of them will follow the paths of their fathers and seek off farm employment. Only a few will become farmers.

Retirees who farm part-time are another important group of rural residents who appear to be expanding. However, their contribution to milk production is minimal. The desire for a rural retirement life style seems very strong among the northern Portuguese. Many of these retirees are emigrants who returned to their home communities, built new homes or remodeled old ones, and farm part-time for home consumption and extra income. Since the number of retirees is expected to increase, it is likely that

they will occupy many of the small farms that are no longer economical units for full-time milk production.

It is obvious that the group of farmers most stressed by accession to the EC are the small-milk producers in the Northwest who have been the backbone of Portugal's dairy industry. For over 20 years they have been encouraged and protected by innovative production and marketing policies. Now, they face an economic environment in which much of the protection will be removed. A limited number of these small-milk producers will be able to expand their operations and compete with their new EC bretheren; a significant number will migrate; and a large number will remain trapped in agriculture. The major challenge for Portuguese policymakers under the EC will be this latter large group of small, poor Northern farmers with limited opportunities.

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Table 1.

Farm Level (Private) and System Level (Social) Profit, 1983-1996
(Esc/Kg of final product)

Alentejo & Algarve	Farm level private profit 1983	1986	1991	1996	System level social profit 1983	1986	1991	1996	Yield 1983	price 1983
Wheat,good soil	11.51	9.80	3.56	3.08	3.03	2.88	2.37	1.92	2000	23.00
Wheat,poor soil	5.62	3.32	-3.07	-3.71	-3.93	-4.16	-4.79	-5.39	1350	23.00
Flour,rabas mill	-0.12	1.31	6.97	7.90	3.16	3.08	5.86	6.77	1000	29.79
Flour,espoada	1.31	2.82	9.02	9.89	4.23	4.10	7.42	8.33	1000	22.00
Sheep	85.23	6.43	-17.13	-30.97	-369.60	-379.40	-263.40	-274.30	20	369.00
Beef,pasture fed	5.20	-48.00	-52.80	-52.30	-119.70	-123.50	-106.00	-104.90	29	330.88
Beef,feedlot	36.94	4.45	5.17	7.86	-23.31	-25.97	-12.08	-8.69	12759	330.89
Cow-calf operation	0.73	-6.67	-7.61	-7.99	-6.23	-6.67	-29.57	-29.75	191	28.00
Sunflower,dryland	5.63	13.56	13.83	14.41	4.06	3.62	10.35	10.96	500	35.00
Rice,Sado valley	12.98	14.13	16.44	17.63	10.91	10.69	13.91	15.10	5000	28.44
Tomato,processing	13.33	18.31	28.99	29.00	2.66	22.05	48.41	48.85	5950	30.59
Citrus,traditional	3.77	2.63	-2.43	-3.27	7.49	6.92	-0.85	-2.03	16000	21.61
Citrus,modern	25.82	24.17	15.55	14.92	23.96	23.48	11.26	10.23	20000	40.50

Ribatejo	Farm level private profit 1983	1986	1991	1996	System level social profit 1983	1986	1991	1996	Yield 1983	price 1983
Wheat,Val do Tejo	15.06	15.15	9.01	8.66	4.83	4.71	4.26	3.87	4000	23.00
Corn,Val do Tejo	12.50	12.68	8.39	7.87	3.23	3.00	5.82	5.32	7000	23.00
Sunflower,irrigated	18.25	27.64	28.19	29.07	19.59	19.31	26.34	27.27	1750	35.00
Tomato,owned	7.17	11.93	22.24	21.85	-2.65	16.44	42.44	42.48	6800	30.59
Tomato,rented	11.40	16.44	27.02	26.92	0.05	19.16	45.19	45.28	7650	30.59
Melon,rented	7.98	7.55	7.09	6.58	7.40	7.17	6.75	6.29	17500	17.30
Sugar,domestic beet	21.61	21.05	19.38	18.84	8.26	33.29	30.31	29.23	6500	34.46
Broilers,integrated	26.49	-1.73	9.50	12.78	-52.53	-52.47	-25.84	-23.19	770	156.05

Azores	Farm level private profit 1983	1986	1991	1996	System level social profit 1983	1986	1991	1996	Yield 1983	price 1983
Cheese,flamengo	67.22	58.24	40.03	33.14	-40.08	-43.86	73.50	65.38	400	188.10
Milk powder,butter	67.22	58.24	40.03	33.14	-68.50	-72.40	59.80	22.00	400	188.10

Northwest	Farm level private profit 1983	1986	1991	1996	System level social profit 1983	1986	1991	1996	Yield 1983	price 1983
Milk,trad breeds	-227.80	-248.80	-317.90	-372.00	-466.60	-495.90	-419.90	-477.90	357	226.50
Milk,small	-33.90	-47.10	-84.60	-107.30	-239.40	-253.10	-152.30	-179.90	1079	216.90
Milk,medium	41.10	14.00	-6.60	-13.10	-192.10	-197.10	-84.10	-94.50	1846	216.90
Milk,large	30.60	-1.80	-20.50	-25.80	-213.60	-217.90	-104.80	-114.00	1846	216.90
Corn,reg varieties	-0.18	-0.83	-6.71	-8.98	-11.38	-12.50	-11.30	-13.59	3000	23.00
Corn,hybrid vars	2.40	1.22	-4.61	-6.81	-7.96	-9.06	-7.78	-9.99	4000	23.00
Potato,traditional	3.21	2.40	1.98	1.52	0.90	0.84	1.39	0.88	15000	15.00
Potato,medium	3.07	2.50	2.26	1.99	0.04	-0.17	0.67	0.26	20000	15.00
Potato,large	3.94	3.37	3.13	2.87	1.40	1.25	2.18	1.88	20000	15.00
Wine,traditional	-5.26	-6.44	-9.44	-10.59	-16.71	-17.78	-22.18	-23.55	8250	18.15
Wine,ramada	3.36	1.83	-2.26	-3.47	-8.72	-9.34	-20.32	-21.69	8250	27.74
Wine,cordao	32.51	29.93	23.59	22.83	20.05	19.68	5.64	4.71	7500	52.22

Table 2. Characteristics of the Whole-Farm Systems for Milk Production in Northwest Portugal.

Item	Traditional General	Small Milk	Medium Milk	Large Milk
Cultivated Area (ha)	1.0	1.0	3.0	10.0
Number of Milk Cows	2[a]	2	12	36
Milk Production Per Cow Per Year (liters)	1,000	3,400	4,000	5,000
Major Crop Yields (hg/ha)				
Corn-grain	3,000	4,000	-	-
Corn-silage	-	-	40,000	50,000
Rye grass	30,000	30,000	30,000	-
Mixed forages	-	-	-	60,000
Pasture	-	-	-	85,000
Potatoes	15,000	15,000	20,000	20,000
Wine grapes	11,000	11,000	11,000	-
Area Per Farm (ha)				
Summer				
Corn/beans	0.7	0.7	-	-
Corn silage	-	-	2.4	6.0
Potatoes	0.1	0.1	0.4	0.5
Pasture	-	-	-	3.5
Grapes	0.2	0.2	0.2	-
Winter				
Rye grass	0.9[b]	0.9[b]	2.8	-
Mixed forages	-	-	-	6.5
Pasture	-	-	-	3.5
Grapes	0.2	0.2	0.2	-
Private Profitability, 1983 (Escudos/ha)[c]	-49,796	-22,647	69,462	59,010
Social Profitability, 1983 (Escudos/ha)[d]	-132,200	-134,100	-314,600	-382,900
Net Effects of Policy 1983 (Escudos/ha)[e]	+82,404	+111,453	+384,062	+441,910

a] Traditional work breeds.
b] Includes 0.1 ha planted under the grape vines.
c] Farm level.
d] System level.
e] Plus (+) equals a net subsidy.