CHINA'S RURAL DEVELOPMENT MIRACLE

WITH INTERNATIONAL COMPARISONS

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MODERNIZATION OF AGRICULTURE IN WESTERN EUROPE AFTER WORLD WAR II: A RESULT OF LUCK, CIRCUMSTANCES OR GOVERNMENT POLICIES?

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Agricultural development in Western Europe since the end of the World War II has been spectacular and particularly rapid. Several authors have even spoken of a revolution to describe the rapid modernization process which has affected European agriculture[1]. Many peasants or their sons have become commercial farmers while an even larger number have left farming either because they have moved to other activities or because they have become old, and retired without successors. This evolution is often viewed as the consequence, or the expression in the agricultural sector, of the general modernization of the European economy during three 'glorious' decades.

In recent years, however, the burden on international markets of the agricultural surpluses from developed countries and the disputes which they generate have shifted attention to the role of domestic agricultural policies in the generation of these surpluses. Thus, for instance, at the Tokyo 'summit', the heads of state from the seven major industrialized countries (Britain, Canada, France, Germany, Italy, Japan and the United States) declared:

> We note with concern that a situation of global structural surplus now exists for some important agricultural products, arising partly from technological improvements, partly from changes in the world market situation, and partly from long-standing policies of domestic subsidy and protection of agriculture in all our countries.

And they conclude:

> We are agreed that, where there are surpluses, action is needed to redirect policies and adjust the structure of agricultural production.

The vast majority of agricultural economists in Western countries would probably view this declaration as too much restrained by its diplomatic status.

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* An outline of this paper was proposed by the Late Denis Bergmann before his death. The final version of the paper presented here has been written by Michel Petit on the basis of this outline and of his own ideas, of ideas he knew were those of Bergmann and of his own views, which the two authors could not discuss. (Ed.)

For them the issue is clear: surpluses are caused by too high price support levels, fixed above market clearing equilibrium levels.

The purpose of this paper is to explore to what extent the rapid rate of modernization of agriculture in Western Europe is the result of deliberate government policies, in particular of the agricultural price support measures making up the European Common Agricultural Policy (CAP). Or is it only the result of luck or general economic circumstances? For the sake of convenience, the analysis will be restricted to the European Community, and in particular, to its ten first members (EC 10: Belgium, Britain, Denmark, France, Germany, Greece, Ireland, Italy, Luxembourg and the Netherlands). First, the general features and the speed of the modernization process will be illustrated by the presentation of a few key statistical indicators. In order to analyze the determinants of the evolution of European agriculture, it will then be useful to review the major forces behind the dynamics of agricultural supply and of the demand for agricultural products.

AGRICULTURAL DEVELOPMENT BETWEEN 1950 AND 1985: A MAJOR SUCCESS STORY

In terms of abundance of supply, volumes of production, maintenance of a family farm structure and even farm incomes, the achievements of the past 35 years are, at least in many good regions of the Community, impressive.

The growth of total agricultural production between 1950 and 1982 has been of the same order of magnitude in the European Community and in the United States. It increased slightly faster in Europe between 1950 and 1963, i.e. prior to the implementation of the CAP. Both indices grew roughly at the same rate between 1963 and 1975. Afterwards, there was a slight decline in Europe and then again a parallel growth. The overall average rate of growth for the period was very slightly over 2% per year in the European Community. This is indeed significant but not outstandingly high if one compares it with other regions of the world.

A major cause of the present difficulties of the CAP is the fact that while supplies increased at a rate of about 2% per year, domestic demand increased much more slowly. This is illustrated in Table 1, giving some indications of the growth in the degree of self-sufficiency of major agricultural products in the European Community. The degree of self-sufficiency is measured by the ratio of domestic consumption to domestic production. It can be seen that this ratio has increased. For several important products such as wheat, beef, poultry meat and dairy products, this ratio is now greater than 100%, which means that the European Community has become a net exporter of the corresponding product. Given the sheer size of the Community and the narrowness of some international markets, these developments are very significant; the European Community has become the first or second largest exporter of these products.

Table 1
Self Sufficiency Ratios for Main Products

Product	EC-9[a] 1970–71	EC-9[a] 1973–74	EC-9[a] 1980–81	EC–10 1980–81	EC–10 1983–84
Wheat	91	104	118	119	134
Barley	98	106	114	113	120
Maize	56	56	66	66	84
Total cereals[b]	86	92	103	103	116
Sugar	91	91	136	137	-
Vegetables	94[d]	94	97	100	101
Fresh fruits	76[e]	79	79	83	84
Oilseeds	27	29	37	37	-
Vegetable fats and oils	23	25	31	31	40
Beef and veal[c]	93	91	105	103	108
Pork[c]	103	101	101	101	102
Poultry[c]	102	103	110	110	107
Butter	-	98[f]	-	-	134
Skimmed milk powder	-	137[f]	-	-	128

a EC–9 (EC-10) = nine (ten) member states. '1970–71' = crop years average 1969–70 to 1971–72, etc.

b Excluding rice

c Calendar years 1969–71, etc.

d 1971–72

e 1972–73

f EC–10

Source: European Commission, *The Situation of Agriculture in the Community*, various issues

More spectacular than the growth in production perhaps is the structural change which has occurred during the period under study. Table 2 gives the evolution of total agricultural employment between 1960 and 1985 by country and for the EC 10. The migration out of agriculture has been massive; the agricultural labour force has been divided by a factor of 2.5 in 25 years (i.e. an average rate of decrease of 3.6% per year). Capital has been substituted for labour, as illustrated in Table 3 which gives the number of selected farm machines (tractors, harvester-threshers, and milking machines) in service for the EC 10 between 1948 and 1984. These numbers increased dramatically in the 1950s; then the rate of increase declined to reach a plateau, for threshers and milking machines, in the 1980s. For later years other indicators would perhaps be more appropriate. It may also be true that the farm income difficulties following the successive oil shocks slowed down the introduction of capital. But this is not reflected in the number of tractors which continued to increase, and in addition, these numbers do not reflect the dramatic increase in the power of the tractors which have been bought in recent years.

Table 2
Employment in Agriculture EC – 10

	Selected years			
	1960	1970	1980	1985
	(thousand persons)			
Germany	3,623	2,262	1,437	1,390
France	4,189	2,752	1,854	1,582
Italy	6,611	3,878	2,899	2,296
Netherlands	408	289	244	250
Belgium	300	174	112	106
Luxembourg	21.9	13.1	8.5	6.8
United Kingdom	1,134	792	647	620
Ireland	390	283	209	169
Denmark	362	266	200	182
Greece	2,019	1,279	1,016	1,037
Total EC – 10	19,058	11,988	8,626	7,639

Source: EUROSTAT, *Annual estimates of employment per country La situation de l'agriculture dans la Communauté*, rapport 19.

Table 3
Selected Farm Equipment EC – 10

	Tractors in use	Harvester threshers	Milking machines
	('000)	('000)	('000)
1948 – 1952	745	20	269
1961 – 1965	3,072	271	516
1965	3,447	283	456
1966	3,603	314	-
1967	3,780	333	-
1968	3,951	408	-
1969	4,115	233	-
1970]			
1971] 1969-1971	4,229	456	1,184
1972]			
1973	4,499	480	1,197
1974	4,542	485	1,231
1975	4,743	482	1,243
1976	4,840	477	1,297
1977	4,941	467	1,307
1978	5,024	472	1,315
1979	5,110	471	1,339
1980	5,293	462	1,306
1981	5,408	462	1,303
1982	5,444	429	1,321
1983	5,494	429	1,317
1984	5,540	459	1,279

Source: FAO

The relative position of farm incomes compared to non-farm incomes has deteriorated since the mid 1970s. It is always difficult to make absolute comparisons of farm and non-farm incomes; consistent time series data for farm and non-farm households are not available for all EC member countries. But it is known that incomes of farm families from non-agricultural sources are important. For instance, a recent survey of household budgets led to an estimate of 50% of farm family income from non agricultural sources in France.

Table 4

Indices of Farm Incomes[a]

Production specialization	% of all full-time farmers[b]	EC – 9 Average incomes of all farmers in 1978 = 100					EC – 10 Average incomes of all farmers in 1981 = 100					
		1978	1979	1980	1981	1982	1980	1981	1982	1983	1984[d]	1985[d]
Cereals	(4)	138	114	112	108	129	115	136	163	144	142	164
Crops	(15)	115	101	97	101	111	101	92	100	92	95	92
Horticulture	(2)	120	115	111	119	101	96	163	138	132	142	137
Wine	(5)	128	119	89	83	133	122	108	173	158	-	-
Fruit & other tree crops[c]	(11)	76	71	79	123	123	131	111	111	118	-	-
Dairy cattle	(16)	118	94	87	96	104	103	132	142	141	125	118
Beef cattle	(4)	88	66	61	68	68	65	93	93	89	8	87
Hogs	(1)	165	179	135	188	220	165	258	305	226	169	209
Mixed crops	(11)	73	64	54	53	60	55	63	73	66	-	-
Mixed crops & livestock	(12)	89	78	74	76	86	77	101	114	103	95	103
All farmers	(100)	100	86	83	86	96	89	100	114	105	105	105

Source: Results of Farm Accounting Network, 1978-81: Farm Accounting Network 1982, 1983

a Agricultural income: net value added by the farm (in real terms)

b Based on structure survey, 1975

c Including olive trees

d Computed from provisional data

More important than average farm income perhaps, is the great degree of income disparities among farms. For instance, Table 4 gives some details of agricultural income per work unit by main farm specialization, on the basis of micro-economic data collected through the EC Farm Accounting Network (RICA). Year-to-year variations are important, as well as income disparities among commodity specializations. In addition, there are enough data, which are not reflected in Table 4, to support the existence of tremendous variations among regions and among farm-size groups. Thus, it is clear that some European farmers, who have large enough farms, located in favourable areas and special-

izing in such products as cereals, quality wines, milk or pork, have very good levels of income. But this does not deny the existence of a deteriorating trend since the first oil shock in 1973. In summary, the evolution of agriculture in the European Community since the end of World War II has been characterized by a massive substitution of capital for labour and a steady growth in production. In spite of a resulting rapid increase in the average productivity of labour and in spite of price support policies, the relative position of farm incomes continues to be viewed as unsatisfactory. On the average, it has deteriorated in recent years.

In order to analyze the determinants of these developments, it is convenient to distinguish between those which influence the dynamics of agricultural supply and those which have shaped the trends in the demand for agricultural products. We turn now to these two categories.

DYNAMICS OF AGRICULTURAL SUPPLY

In addition to high agricultural price support levels, which have encouraged the growth in agricultural production, the modernization of the sector, understood as resulting from a complex interaction between technological and structural changes, has had, of course, an impact on the volume of production. Let us briefly review the main forces which have brought about these various changes.

The supply of innovations and their diffusion

Technological change results from the supply of innovations, from their diffusion and from their adoption by farmers. European farmers have been well supplied with mechanical, chemical and biological innovations. These have come from public research institutions, or from private firms seeking to develop either their markets or, sometimes, their sources of raw material. The innovations are spread through varied advisory services. Strong and efficient input industries commonly supply farmers with the required factors of production, which most often embody the new technologies.

If one follows the induced innovation hypothesis, proposed by Hayami and Ruttan, the process of innovation responds to economic stimuli. Thus, one may argue that high agricultural prices stimulate the adoption of innovations. Hayami and Ruttan's comparative analyses of the Japanese and USA experiences, however, demonstrate the influence of relative input prices, particularly land and labour, rather than that of product prices. In addition, there is little doubt that the creation of innovations has at least some degree of autonomy from the direct influence of prices. In most Western European countries, the biological and agricultural research establishment is strong with, for most disciplines, at least a few teams which are creative and can be regarded as of international excellence.

The diffusion of innovations has been facilitated by a rising level of education among farmers (i.e. another factor of autonomy for the innovation process). In addition, competition among farmers in a rapidly changing technological environment ensures that, in order to survive as farmers, producers are forced to adopt innovations in spite of falling product prices, this behaviour having the collective effect of bringing more downward pressure on prices. This phenomenon has been observed for the USA by Cochrane, who coined his famous 'farmers on a treadmill' expression.

The adoption of innovations often requires new investments and hence a growth of the production apparatus in terms of both land and capital. Poor or not well educated farmers are ill-equipped to enter this never ending modernization process or they can not proceed at a fast enough pace. Many of them are eliminated as agricultural producers.

Many questions are raised in Europe, particularly in France, about this elimination process. Often advisory services are accused of reaching only a small minority of farmers, whereas many of them are faced with technical problems and thus are, in principle, eligible to receive the services of the farm advisors. These advisors are also educators, rendering a public service. As such, they should be available to help every farmer. Many of them make creditable efforts to fulfil that goal. They try to promote farmers' groups, reaching out to the younger farmers and to farm women. Such groups have been very successful as they collectively analyze their own problems, explore possible solutions, test them and, in this uncertain process, support each other.

Whatever the merits of these actions, the analysis of the elimination process presented above provides us with a clear interpretation of the main features of the evolution of agriculture, described in the previous section of this paper. In this explanation, the pace of modernization is directly dependent upon the movement of people out of agriculture. Before discussing the forces at play there, it is useful to reflect on the role of governments in the process of innovation creation and diffusion, which has just been discussed. Clearly, public intervention is pervasive in this domain. Most agricultural research is publicly supported; advisory service activities are financed directly out of the public Treasury or on the basis of taxes, collected on agricultural product sales under the aegis of the tax collection authorities. Could a specific government reduce its level of spending on agricultural research and extension? Assuredly yes, but it is often viewed that this would be tantamount to a suicidal option, in as much as countries compete against each other on world markets. To complete the general explanation of the determinants of the dynamics of supply in Europe since the end of World War II, one must now investigate the role of forces effective on the labour and land markets.

Modernization of family farms, government support for labour mobility and capital accumulation

In spite of the profound structural changes and concentration process experienced over the past 35 years, most regions of Western Europe have maintained and even reinforced the dominance of family farms in their farm structure. In all countries except UK, the share of the labour input provided by salaried workers has decreased regularly and is now quite low (less than 15%).

The counterpart of this, of course, has been a considerable capital accumulation, partly in labour-saving equipment, which enabled farmers and unpaid family members to produce much more and enlarge their farm in spite of the reduction in the numbers of salaried workers.

At the national level, it appears that there was a net capital flow from the rest of the economy towards the agricultural sector, a significant reversal of the major trend during the late nineteenth century and, probably, most periods during the first half of the twentieth. More concretely, this net capital flow can be explained

by favourable farm prices and by the strength of the farm credit institutions. In part, through government support, these were able to lend abundant funds to farmers both for equipment and for land purchases. Interest rates were low, particularly in real terms, taking inflation into account. A less well-known factor is the extent of intra-family financial help provided by non-farming family members to the brother (or sister) remaining on the farm. This exists, on a voluntary basis, even in regions where custom and law provide, in principle, for equal (Roman law) systems of inheritance. This help can be informal, or recommended and facilitated by various laws, or institutionalized by the setting up of family corporations.

In addition to these public regulations which have facilitated the modernization of family farms, permitting the emergence of a large number of efficient and dynamic commercial farms out of a much larger number of peasant farms, direct government interventions have sometimes been deliberately aimed in this direction. Several programs at the national and Community levels have encouraged the movement of people out of agriculture through improved retirement benefits for old farmers and retraining education for their sons and daughters attempting to prepare themselves for jobs outside of agriculture. Similarly, capital accumulation has been encouraged through targeted subsidies and credit facilities for farmers investing in new equipment, and enlarging their farms in such a manner that they could jump from a category having little prospect of a decent income in agriculture to another more promising situation. The last major item in the modernization of family farms is their access to the land market.

The land market, tenancy, zoning and land use regulations

In densely populated Europe, there is much tension in the land market. There are many conflicts between various uses of land and antagonistic social groups. Attempts have been made in several countries to regulate sales of land in order mostly to prevent excessive concentration and to obtain a more orderly pattern of land ownership. Public interventions and institutions vary from one country to another within the Community. Generally speaking, in spite of the great difficulties involved, some positive results have been obtained. The main achievement is that, through farmers' actions, the set of social actors involved in the decision processes in the land market has been enlarged. Competition in the land market is often controlled and, clearly, medium-size family farms have been favoured.

Tenancy and tenancy regulations are a second and more important item pertaining to land. Well organized tenancy is a fundamental element giving some mobility and flexibility to the land factor, enabling young dynamic farmers to enlarge and older ones to reduce the size of their operations while they obtain some income from their land assets. It also permits a reduction in the capital cost of farm enlargement; instead of the operating farmer having to buy all the land, part of it can be financed by another economic agent, the landlord. This eases the burden for the tenant.

These, however, are theoretical advantages, and, in practice, efficient operation of a system with partial or even complete tenancy requires many safeguards and measures preventing unfair exploitation. This has often been obtained, in several European countries, through government regulation of tenancy. For instance, in France a law passed just after the World War II, fixes a ceiling on

the rent paid by the tenant and provides a good security of tenure. Rental agreements cannot be for less than a nine year duration, and farmers cannot be evicted by the landlords, unless a court decides that they are not farming properly. The only possibility for the landlord is to take over the farm operation himself or to have one of his children do it. Conversely, if the tenant wants to retire, he can leave his farm to one of his children. All of these measures clearly encourage a family farm structure.

A third major group of problems concerning land pertains to orderly land use which is not obtained under conditions of uncontrolled free markets. In old countries with much pressure of population on the land, the pattern of ownership and layout of fields and farms becomes disorderly and very fragmented; remedial measures are needed. Protection of farmland against encroachments by non-agricultural uses is also required for two main reasons. First, haphazard and exaggeratedly scattered building of dwellings is costly in terms of transportation, time and utilities. Proper planning is necessary. Second, the high value of farmland diverted to those non-agricultural uses exerts dangerous price increasing influences on the majority of farmland values thus making it more costly to enlarge farms or to start in farming.

Various remedial measures have been taken, differing from country to country. They often involve zoning rules, land use planning, taxation incentives. Intervention by government agencies in those matters reveals underlying and hidden conflicts and is therefore always difficult. There is little doubt, however, that these measures have facilitated the coexistence side by side of a dynamic agriculture and of industrial or urban land use activities, thus shaping the typical western European landscape.

Conclusion

In summary, the dynamics of agricultural supply appears as the result of a complex set of interrelationships among many phenomena. Most of these have been the object of pervasive public intervention. Yet, it is also clear that technological and structural changes in agriculture have been influenced by major changes in the economy at large, changes which have their origin outside agriculture and which could only very marginally have been influenced by agricultural policies.

CHANGES IN THE DEMAND FOR AGRICULTURAL PRODUCTS

Whereas the forces shaping the evolution of supply have produced a relatively rapid growth of production, domestic demand for agricultural products has been much more sluggish. This has led to a growth in agricultural exports. But these are restricted by the depressed situation on many international markets.

Domestic demand and the growth of the food processing and distribution sector

A slow demographic growth (about 2% in recent years), sluggish general economic growth from a level where food consumption is already close to saturation, and a continuing growth of the use of industrial substitutes for non-food agricultural products; together explain why the consumption of agricultural products in the European Community has grown so slowly (generally less than

1% per year). For most member countries, food expenditure as a proportion of total household expenditure is now close to 20% or less. The only exceptions are countries such as Greece, Ireland and Portugal, precisely those having the lowest per capita income.

As distance between farmer and food consumer increases, the role of direct marketing, though not unimportant, decreases and a huge processing and marketing system has to be built. Thus, the demand for agricultural products is more and more a derived demand from the final food demand. It was estimated that in 1985, 75% of agricultural products in the Community were bought by processing industries. The food industry had a total turnover of almost 300 billion Ecus, i.e. almost twice as much as the total value of final agricultural production. The economic importance of the processing sector has been growing faster than agricultural production, reflecting a growing demand for the services incorporated in processed food products. Thus, the income elasticity of the derived demand for agricultural products is much less than the income elasticity of final food demand. These factors illustrate and explain the slow growth in the domestic demand for agricultural products within the Community.

Government interventions on agricultural product markets and European agricultural exports

A modern agriculture, of the type developed in the European Community, cannot prosper in an unstable environment. Since the crisis of the 1930s, European government intervention in agricultural markets has constantly grown to provide some degree of price stability. Given the difference in the rates of growth of domestic demand and supply, it is therefore not surprising that governments have been faced with growing surpluses which they have had to store or to export. When they do not export directly, they still play a critical role in helping to finance these exports. The establishment of the European Common Agricultural Policy in the 1960s continued, in this respect, a policy already begun earlier by several member countries. As already discussed in reference to Table 1, the degree of self sufficiency of the Community has increased for the most important temperate agricultural products. The Community has even become a major exporter of wheat, sugar, beef, butter and skimmed milk powder.

As is well known, the cost to the European budget of the export subsidies paid by FEOGA[2] has increased dramatically in recent years and reached 8.6 billion Ecus (i.e. over US $9 billion) in 1986. The magnitude of this figure reflects the difficulties of exporting on already glutted international markets. The most spectacular case is probably the world wheat market affected by a well publicized 'subsidy war' between the United States and the European Community. Wheat is the single most important, internationally traded, agricultural commodity.

More generally, the total cost to the FEOGA of product market intervention grew from 12.4 billion Ecus in 1982 to 22.2 in 1986. This has been a major source of pressure on the CAP within Europe.

Actually, given these pressures, it may be surprising that the CAP has not changed more. Two main reasons explain this relative stability. First, public opinion, on the continent at least, is generally supportive of government policies in favour of agriculture. Farmers are viewed as hardworking, deserving victims of blind market forces which must be checked. After all, other social categories in

difficulty also benefit from public programs. Secondly, the policy-making process within the Community, which practically requires unanimous agreement among member countries to take any important decision, provides a strong bias in favour of the status quo. Under pressure, particularly budget pressure, the CAP has evolved, but only as a result of a compromise. To reach a compromise has been lengthy and difficult; and a radical transformation of the CAP has always been outside the realm of possible compromise. It would have been unacceptable to several member countries.

CONCLUSION

These considerations help us to answer the main question raised at the beginning of this paper: to what extent are the European surpluses the result of too high price support levels? The situation is somewhat analogous to the controversy between the Keynesians and the Neoclassical Economists about the role of wage inflexibility in the causes of unemployment. One could say that if agricultural prices were lowered long and low enough, surpluses would disappear. But such a price decrease would have to be so drastic that it would clearly fall outside what would be socially and politically feasible.

The evolution of agriculture in Western Europe since the end of the World War II has been extremely rapid and widespread. It led to a completely new agriculture, mainly made of a category of full-time commercial farmers and a still larger category of very varied part-time farmers, deriving most of their income from non-agricultural sources. In the investigation of the causes of this evolution, it seems obvious that government policies, which have been pervasive and of growing importance since the 1930s, have played an important role. But one must also recognize that the main economic causes of the evolution have to be sought outside agriculture.

At the risk of exaggerating the argument, one may interpret all this evolution as an adaptation of agriculture to the rising long term trend in the relative price of labour. The general modernization movement of agriculture can be viewed as a substitution of capital for labour, permitting the introduction of new inputs incorporating technical progress. Such a response to a rising price of labour is completely consistent with a simple, but apparently robust, economic model. In this perspective, government interventions appear as marginal adjustments along the general economic trend, making the trend socially acceptable and, thus, politically viable.

NOTES

1 See for instance: Debatisse M., *La Révolution silencieuse, le combat des paysans* (The Silent Revolution, the peasants' struggle), Paris, Calmann-Levy, 1963.

2 FEOGA: Commonly used, French acronym of the fund financing the European CAP (European Agricultural Guidance and Guarantee Fund).