

## ***Agriculture in Nineteenth Century France and Britain: Another Explanation of International and Intersectoral Productivity Differences***

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In his article on "Productivity in Nineteenth Century France and Britain: A Note on the Comparisons", in this Journal, Clark Nardinelli has offered an explanation of "an important paradox", according to which "agricultural' France apparently had a much higher labour productivity in industry than in agriculture, while 'industrial' Britain had, before 1875, higher labour productivity in agriculture than in industry" (p. 428).<sup>1</sup> Nardinelli explains these international differences in labour productivity in agriculture in relation to productivity in industry by different agricultural production functions, so that average labour product in agriculture in Britain is above non-farm labour product although marginal labour products are equal in both sectors. With respect to France, Nardinelli suggests that relative low farm labour product is due to the fact that "French peasants tended to own their own small farms rather than rent or work for wages on large farms" and "they also resisted the enclosure of open fields and commons" (p. 429): "Political and economic risks, and perhaps other factors, kept French peasants on their farms even when pecuniary returns were higher in cities" as Nardinelli explains (p. 431). Whereas in Britain, farmers

<sup>1</sup> NARDINELLI, "Productivity in Nineteenth Century France and Britain: A Note on the Comparisons", *The Journal of European Economic History* 17 (Fall 1988), pp. 427-434. Inter alia Nardinelli is referring mainly to PATRICK K. O'BRIEN and CAGLAR KEYDER, *Economic Growth in Britain and France, 1780-1914* (London: GEORGE ALLEN & UNWIN 1978).

are maximizing their profits, French farmers have different, non-economic preferences according to this author. However, the question has to be asked whether we really have to take refuge in different preferences in order to explain discrepancies in productivity between both countries? Perhaps low labour productivity in French agriculture can also be explained by economically rational decisions of farmers in France similar to those of British farmers?

At least since Simon Kuznets' extensive analysis of intersectoral productivity differences in a great number of countries, we now know that such differences are the rule more than an exception.<sup>2</sup> Furthermore, Kuznets as well as Chenery and Syrquin<sup>3</sup> are convinced that there is a systematic interrelationship between the size of backlogs of labour productivity in agriculture vis-à-vis productivity in industry and services. According to Chenery and Syrquin, "relative labour productivity in the primary sector falls from about 70 percent to 50 percent at an income level of \$ 500 and then gradually rises as agricultural technology is modernized and the surplus labor is absorbed by the rest of the economy... Once the \$ 1500 income level has been reached, the primary labor share has fallen to 16 percent, and migration has reduced the labor productivity differential quite substantially, then the shares of industry and services in the labor force are much larger and become very close to their shares in production. The relative labor productivity in the primary sector, however, still lags in a number of the advanced countries" (p. 53).

As table 1, however, reveals, even in developed economies such as the member states of OECD or the European Economic Community, far reaching intersectoral productivity differentials are still to be observed. For instance, relative labour productivity in

<sup>2</sup> KUZNETS, *Economic Growth of Nations. Total Output and Production Structure* (Cambridge: Harvard University Press 1971).

<sup>3</sup> HOLLIS CHENERY and MOISES SYRQUIN, *Patterns of Development. 1950-1970* (London: Oxford University Press 1975).

French agriculture still lags behind that of the United Kingdom,<sup>4</sup> whereas in Germany, Italy and Japan agriculture's labour product is only about 40 percent of that in non-farm sectors. On the other hand, in Belgium, the Netherlands, Australia and New Zealand that ratio is above 80 percent, sometimes above 100 percent. Furthermore, a clear-cut trend towards a narrowing in labour productivity differentials cannot be observed as Kuznets and as Chenery-Sirquin have ascertained.

Most likely, Nardinelli would explain these large international discrepancies in relative farm labour product by similar "institutional" factors as he has done with respect to similar productivity differences in France during the last century. Kuznets has also discussed these productivity differentials very systematically (pp. 236-248). Because he could not find any explanations which might be consistent with economic theory, such as "a greater supply of material capital per worker or a greater return to capital" in industry and services, or intersectoral differences in human capital and differences in "cost of moving", he finally comes to the conclusion that "the discussion tended justifiably to various aspects of duality of structure in the less developed countries"; but "that such duality, if present in developed countries, plays a much less important role" (p. 247). Thus by relying on structural dualism at least in developing countries Kuznets explains intersectoral productivity by "institu-

<sup>4</sup> If relative total and farm labour productivity as represented in table 1 is related to GNP per capita, it can easily be seen that labour productivity in French agriculture was still below labour productivity in British agriculture during the period between 1960 and 1984 while labour productivity in French industry was above the productivity in the United Kingdom. The fact that farm labour product in France is smaller than farm labour product in Britain is also revealed by more sophisticated estimates published by EUROSTAT (Agricultural Income 1987. Sectoral Income Index Analysis Theme 5. Series D Luxembourg 1988, p. 56). According to EUROSTAT (Farm Structure 1983 Survey Main Results Theme 5, Series C. Luxembourg 1986, p. 52-53) in 1983 32.5 percent of holders and 25.4 percent of spouses in French agriculture were gainfully employed outside agriculture, whereas in the United Kingdom these percentages were only 24.6 and 18.0 percent.

tional" factors in a similar way to Nardinelli, although structural dualism is quite different to Nardinelli's explanation of productivity backlog in French agriculture. In fact, by referring to structural dualism, Kuznets has mainly institutional barriers in labour markets in mind which prevent agricultural surplus labour from entering non-farm labour markets,<sup>5</sup> while Nardinelli is relying on "preferences for agriculture" by French farm population (p. 431). Labour productivity is measured by most economists, and hence, by Kuznets, Chenery and Syrquin as well as by authors mentioned by Nardinelli, by relating sectoral output (value added) to labour input in that sector. Especially with respect to agriculture, the problem, however, arises whether and to what degree agricultural labour input corresponds to that sector's output.

In this respect, it has to be noted that Kuznets was well aware of such "problems of classification" of the farm labour force (pp. 233-236). He concluded that "to the extent that workers migrate periodically or temporarily from one production to another, or hold several jobs at one time, cutting across sectoral... boundaries, the available classification of the labour force does not properly mesh the sectors in labour force with those in product" (p. 233). There are, in fact, two consequences already discussed by Kuznets of such an inconsistent classification of labour input in various sectors. First, especially in agriculture, labour statistically attached to agriculture is engaged partly in non-agricultural sectors. In that case, of course, non-farm output of parts of the farm labour force is

<sup>5</sup> With respect to developed countries where "duality plays a much less important role" according to Kuznets (p. 287) most agricultural economists agree with THEODORE W. SCHULTZ, *Agriculture in an Unstable Economy*. (New York and London: Mc Graw Hill 1945 p.201) that "the movement of people from farms is at best difficult. The entry of workers into many fields is hedged by restriction...". However, as table 1 reveals, such an explanation seems to be ill-founded because far-reaching differences in relative farm labour productivity between those developed countries demonstrate the inconsistency of such a hypothesis. See GÜNTHER SCHMITT, "Landwirtschaft in der sozialen Marktwirtschaft: Neu betrachtet", *Berichte über Landwirtschaft* 66 (Mai 1988), pp. 210-235.

assigned to the non farm sector, and, hence, will result in an overestimation of labour productivity in that sector and an underestimation of productivity in agriculture. Second, according to Kuznets (p. 234), "we can assume that the non-agricultural product turned out by the agricultural labour force is not included by the industry and service component of product, and thus not included in GDP at all". In this case, non-farm labour productivity will not be so overestimated but farm productivity will be underestimated. As far as agriculture is concerned, part-time farming will result in biases of intersectoral productivity ratios which we mentioned first, whereas the second case is mainly relevant to household production by farm families provided that agricultural labour as measured by labour statistics is engaged in household production, although Kuznets has not mentioned household production as such.<sup>6</sup>

According to Kuznets' discussion of the implication of these classification biases in relative labour productivity in agriculture, we might have another and, as I will demonstrate, more powerful and general explanation of intersectoral and international productivity differentials in agriculture, an explanation which might also solve the productivity "paradox" in France and Britain during the XIXth century. However, despite the fact that there is still growing empirical evidence, supporting Kuznets' assumptions concerning off-farm activities as well as household production of members of farm families, and, hence, labour statistically attached to the farm

<sup>6</sup> According to more recent analyses, household production is relatively more important in developing countries and household production by farm families is more important as compared to non-farm household. See inter alia L. GOLDSCHMIDT-CLERMONT, "Non-market Household Production in Developing Countries", Paper presented at the XXth General Conference of the International Association for Research in Income and Wealth, Rome 1987. The implication of household production by farm families for labour productivity are discussed in GÜNTHER SCHMITT, "SIMON KUZNETS' *Sectoral Share in Labour Force*? A Different Explanation of his  $(1 + S)/A$  RATIO". *American economic Review*, vol. 79 (1989), pp. 1262-1276.

force but not allocated to agricultural production,<sup>7</sup> Kuznets comes to the conclusion that "these classification biases would have to be improbably, indeed impossibly, great to have a significant effect on the intersectoral inequalities that have been established" (p. 234).

Kuznets has based this conclusion on "illustrative calculations" of necessary "shifts or additions of non-agricultural output by the agricultural labor force in order to equalize per worker product in the agricultural and industry and service sectors" (p. 235) which are seen as "far too large to be likely". However, beside the fact of such calculations imputed income of household production by farm families is neglected, the question arises whether and to what degree such "illustrative calculation" may be seen as a realistic and relevant base for the "plausibility" or probability of prevailing intersectoral productivity differentials in various countries analyzed by Kuznets or demonstrated in table 1.

In the following part, I will present a simple theoretical model of labour allocation in farm households seen as the relevant institutional device instead of the farm as a firm allocating its resources to agricultural production only. On the base of that model of the farm household, I will analyse, first, productivity backlogs of French agriculture, and, second, the British case of superior farm labour product vis-à-vis non-farm labour product. Next, I will analyse productivity differentials in agriculture between France and Britain. Farm productivity differences between both countries will, then, be discussed with reference to the "Agrarian Question" of the late

<sup>7</sup> Kuznets (pp. 217-233), furthermore, has adjusted official statistics of farm labour with respect to "unpaid family workers, female workers and extreme age groups (male) included in the farm labour force to a relatively greater extent compared to the non-farm labour force". However, he came to the conclusion that "the adjustment reduces intersectoral (productivity) inequality... yet the reduction in the range is relatively moderate..." (p. 229). Therefore, prevailing intersectoral productivity differences cannot be explained by such an over-representation of these specific groups in the agricultural labour force.

Table 1

## LABOUR PRODUCTIVITY IN AGRICULTURE AS A PERCENTAGE OF TOTAL LABOUR PRODUCTIVITY IN OECD-COUNTRIES

U.S. Dollar	GNP per capita	Agricultural labor productivity in percent of total productivity <sup>2</sup>				
		1980 <sup>1</sup>	1960-67	1968-73	1974-79	1980-84
OECD-countries	8,844	30.5	33.1	38.2	34.3	33.3
All EC-member states		43.0	44.7	46.1	41.3	41.5
thereof:						
Belgium	11,957	78.9	86.9	79.4	83.3	81.3
Denemark	12,715	35.2	—	61.7	72.2	—
FR of Germany	13,372	40.3	40.0	40.0	40.0	40.1
Grecce	4,354	40.7	40.9	47.0	54.0	43.9
France	12,165	44.4	48.5	50.5	48.9	48.1
Italy	6,914	41.5	39.7	44.7	45.7	42.6
Netherlands	11,287	90.4	93.5	85.4	73.5	87.6
United Kingdom	9,288	71.4	81.3	85.4	70.3	75.8
Spain	5,653	54.5	41.9	41.2	36.9	46.8
Portugal	2,377	51.3	52.5	60.6	—	58.9
United States	11,536	49.2	63.0	76.9	77.1	61.2
Australia	9,398	108.9	92.5	88.1	76.0	95.0
Canada	10,288	47.7	52.0	62.7	66.7	55.1
Sweden	14,597	48.4	52.5	64.5	58.1	53.4
Japan	8,905	39.8	37.7	42.1	35.0	39.4
New-Zealand	7,742	—	110.0 <sup>3</sup>	88.3	76.0	90.8

1) National currency values converted into dollars by the average 1980 par rate/market rate, as published by IMF.

2) Agricultural GDP (at market prices) per civilian person in agriculture as percentage of GDP per civilian employed person in the whole economy.

3) 1973.

Source: OECD (1986, p. 36 and 50), and USDC (1981, p. 879).

nineteenth century. Finally, relevant implications on the level and growth of national income of France will be analyzed.

## 1. A Model of the Farm Household: The French Case

In figure 1A a model of a farm household is demonstrated implying that members of the farm family supply available time to produce farm products A (including household production), to off-farm employment O and leisure time. This model corresponds to Becker's (1965) model of optimal allocation of time.<sup>8</sup> It differs from Becker's model by taking off-farm as well as farm activities into account. The model of farm households, of course, differs from the traditional concept of farms as firms, a concept on which agricultural production economics relies and, hence, conventional methods of measuring productivity in agriculture.<sup>9</sup>

Income offered by farming is reflected in the income possibility curve  $Y^A$  subject to diminishing returns, whereas income offered by off-farm employment is reflected by the off-farm income possibility curve  $Y^O$  determined by the wage rate  $MP^O$ . Assuming perfect factor and product markets, the farm family is allocating labour time  $TL^A_1$  to farm production and  $TL^O_1$  to off-farm employment, so

<sup>8</sup> GARY S. BECKER, "A THEORY OF THE ALLOCATION OF TIME", *Economic Journal*, 75 (Sept. 1965) pp. 493-517. For a more detailed presentation of the farm household model see GÜNTHER SCHMITT, "Wie optimal ist eigentlich die 'optimale' Betriebsgröße in der Landwirtschaft?" *Agrarwirtschaft* 37 (August 1988) pp.234-245. In this article, imperfections of labour as well as land markets are analyzed which are not discussed in this article.

<sup>9</sup> The model of the farm household as the relevant institutional device for allocation of resources in agriculture was created by Alexander Chayanov in 1923 (Alexander TSCHAJANOW, *Die Lehre von der bäuerlichen Wirtschaft Versuch einer Theorie der Familienwirtschaft im Landbau* (Berlin: Paul Parey 1923)). However, Chayanov's original contribution has been almost neglected by agricultural and development economists. See GÜNTHER SCHMITT, "Ein bedeutender Agrarökonom ist wieder zu entdecken: Alexander Tschaianow (1888-1939)". *Zeitschrift für Agrargeschichte und Agrarsoziologie* 36 (1988), pp. 185-216.

that total labour input is  $HTL^{A+O}_1$  and  $T - TL^{A+O}_1$  is leisure time. Income achieved by such an optimal time allocation will result in optimal utility for the farm household so that indifference curve  $I_2$  will be approached.<sup>10</sup>

In figure 1B average and marginal labour product achieved by that farm family are deduced. An allocation of labour time as just described will result in equality of marginal farm labour product  $MP^A$  with off-farm wage rate  $MP^O$  (opportunity cost of farm labour input) at that farm labour time  $TL^A_1$ . Total labour input of the farm household  $TL^{A+O}_1$  exceeds labour time used for agricultural production only. However, if total labour input  $TL^{A+O}_1$  is defined by official labour statistics as the farm labour force and related to agricultural production only, marginal as well as average farm labour product  $MP^A$  and  $AP^A$  is below the wage rate  $MP^O$ , the indicator of non-agricultural marginal and average labour product. In other words, off-farm output by "farm" labour  $TL^O_1$  is neglected, provided that  $TL^{A+O}_1$  is defined statistically as the total farm labour force. If only the real labour input  $TL^A_1$  is statistically defined as the farm force and is related to farm output, actual farm labour product will be estimated correctly. In consequence, if farm labour used for farm and off-farm as well as household production is statistically attached to agriculture, then of course, farm labour product is underestimated. Furthermore, labour product outside agriculture will be overestimated because off-farm value added achieved by "farm labour"  $TL^O_1$  is included in the non-agricultural component of GNP, while labour input is not included statistically in the non-agricultural labour force. As a consequence, intersectoral productivity differences are biased due to an overestimation of non-agricultural productivity as well as an underestimation of labour produc-

<sup>10</sup> I restrict my discussion of the theory of farm household to perfect product and factor markets. Implications of imperfect markets are analyzed in GÜNTHER SCHMITT, "Simon Kuznets..." see footnote 5) and "Wie optimal..." by the same author (see footnote 8).

tivity in agriculture as Kuznets has already discussed but rejected. According to Kuznets and other authors, farm labour  $TL^O_1$  actually allocated to off-farm activities is defined as agricultural surplus labour, which theoretically could be transferred to non-agricultural sectors without affecting farm output.<sup>11</sup>

Our model of a farm household, allocating farm labour to off-farm activities and showing farm labour product below off-farm wages within the range of total labour supplied by that household, is most relevant for France agriculture. Data on labour productivity in France show that labour productivity in agriculture is below productivity in the non-agricultural sector according to O'Brien and Keyder.<sup>12</sup>

## 2. A Model of the Farm Household: The British Case

But what about agricultural productivity in Britain being well above labour productivity in industry according to O'Brien and Keyder? Figure 2 will provide an answer to that question which, in fact, is the micro-economic dimension of Nardinelli's macro-economic view presented in his first diagram (p. 430).

As is well-known, mainly due to the enclosure movement in the XVIth and XVIIth century, in Britain structural adjustment has resulted in farm sizes much above farm sizes in France but also in farms employing hired labour in addition to family labour. In

<sup>11</sup> The implication of such a definition and quantification of  $TL^O_1$  as "agricultural surplus labour" on national income as discussed by O'Brien and Keyder (op. cit. pp. 90-101) is analyzed in the final paragraph. I have discussed theories and implication of surplus labour in agriculture of developing countries in GÜNTHER SCHMITT, "What About Disguised Unemployment in Agriculture of Developing and All Theories Around It?" *Quarterly Journal of International Agriculture*, 28 (1989), pp. 126-153.

<sup>12</sup> O'BRIEN and KEYDER (op. cit. pp. 90-91). The data on labour productivity in France and Britain estimated by these authors are also reproduced by Nardinelli (op. cit. p. 434).

France, however, family labour was and is still the dominant labour input in agriculture.<sup>13</sup> What is, therefore, the rationale of labour allocation in farms employing hired labour in addition to family labour with respect to intersectoral differentia in labour productivity? Of course, farms will be enlarged if marginal productivity is higher compared to smaller farms. Furthermore, hired labour only will be employed in those farms if labour productivity is at least as high as in non-agricultural sectors, because hired labour can easily move to non-farm employment.

In Figure 2A a larger and more productive (British) farm is demonstrated as compared to the smaller (French) farm by a lower wage rate  $MP^0$  relative to farm product, and, hence, a flatter course of the off-farm income possibility curve  $Y^0$  and  $Y^A + 0$ <sup>14</sup>. The farm family will, therefore, supply all its labour time  $TL^F$  to agricultural production, so, contrary to French agriculture, non off-farm employment of farm families will be efficient. However, in addition to family labour input  $TL^F$  hired labour  $TL^H$  will be employed because marginal farm product  $MP^A$  exceeds the wage rate  $MP^0$ . Therefore, employment of hired labour  $TL^H$  will be efficient. Average farm labour product  $AP^A$  at total farm labour input  $TL^F + H$  exceeds the wage rate of hired labour as well as of off-farm employment  $MP^0$  and, hence, average off-farm labour productivity  $MP^0$ . Contrary to French agriculture, total farm labour  $TL^F + H$  is correctly measured statistically because there is no off-farm employment of farm families. Therefore, most important is the fact that, first, in British

<sup>13</sup> As farm labour statistics in EC reveal, in France as well as in other EC member states of continental Europe the ratio of hired to family labour in agriculture is less than 1:5, whereas in the United Kingdom the ratio is 1:2.

<sup>14</sup> In order to avoid possible misinterpretation of figure 2, it has to be stressed that only the ratio of wage rates to farm labour productivity is seen as relevant. By relying on wage rates  $MP^0$  of figure 1, identical results will be deduced if in figure 2 wage rates of figure 1 with a farm income possibility curve above that of figure 1 and 2 is assumed, the latter reflecting larger and more efficient (British) farms as compared to French in figure 1.

agriculture farm labour product exceeds non-farm labour product which is completely in line with empirical evidence presented by O'Brien and Keyder. Second, provided that off-farm labour productivity in French agriculture is as high as in Britain, so that the ratio of off-farm wages to farm product is similar to figure 1, due to less efficient (smaller) farms in France, relatively less family labour would be used in farming and relatively more in off-farm employment. Of course, figure 2 is completely in line with Nardinelli's model presented in his figure 1 (p. 430), although figure 2 refers to the farm at the micro-level.

### **3. The French and the British Case Compared**

As has been demonstrated in figure 1, farm labour productivity in French agriculture is underestimated in absolute terms as well as in relation to labour productivity in industry due to misleading classification of farm labour input. Because in France, smaller farms are mainly family farms where almost only family labour is employed in agricultural production, non-farm output of farm labour is not related to "farm" labour input but to the non-farm labour force, whereas imputed income of household production by farm labour is not included in agriculture's contribution to GNP. In Britain, however, on larger and more efficient farms hired labour is employed in agriculture in addition to family labour. Family labour, therefore, is not allocated to off-farm employment, or if it is, to a much smaller degree as compared to France. Therefore, farm labour input in Britain has been estimated by official labour statistics correctly. In consequence, farm labour productivity as estimated by O'Brien and Keyder is measured correctly as well.

However, the question has still to be answered why French agriculture is dominated by smaller (family) farms as compared to larger and more efficient farms in Britain employing hired labour

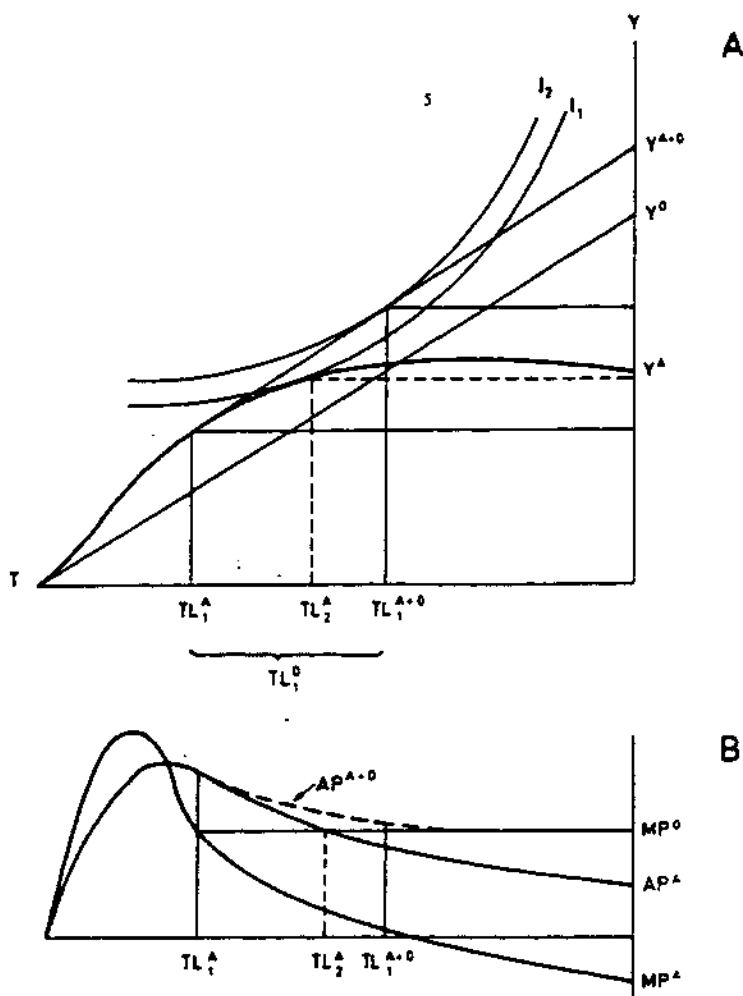
as well.<sup>15</sup> The answer given by Nardinelli, according to which "political and economic risks, and other factors, kept France peasants on their farms even when pecuniary returns were higher in the cities" (p. 431), is not very convincing to my mind. If larger farms are more efficient due to economies of scale, why did French farmers not enlarge farms in order to achieve higher incomes as their British colleagues had done? Of course, there might have been institutional constraints, but are they sufficient for explaining such far-reaching differences in farm sizes, and, hence, labour productivity? I doubt such an assessment very much. Therefore, I will present a different explanation by referring to family farms as the institutional device of farming in France as well as in Britain.

In figure 1 we have demonstrated that farm family labour is allocated to off-farm employment if marginal farm labour product falls short of off-farm wage rates within the range of the labour capacity of the farm family. This, of course, means that farm families do compare off-farm income with farm income in order to allocate family labour most efficient as Alexander Chayanov had already demonstrated in 1923.<sup>16</sup> Chayanov has explained "that peasant family division of labour between earnings from agriculture and from craft and trades is achieved by a comparison of the market situation in these two branches of the national economy. And since the relationship between these two markets is inconstant, the relationship between labour expenditure in crafts and trades and in agriculture is also inconstant..." This means, in other words, that if the off-farm wage rate increases relative to agricultural labour product, for the farm family it is more efficient to expand off-farm employment rather than to use farm labour in agricultural production. In terms

<sup>15</sup> See footnote 13.

<sup>16</sup>ALEXANDER TSCHAJANOW, *op. cit.* (see footnote 8). In referring to the edition of his "Die Lehre" of 1925 which was translated into English in 1966 and reprinted in 1986 A.V. CHAYANOV, *The Theory of Peasant Economy*, ed. by D. Thorner, B. Kerblay and R.E.F. Smith (Manchester: Manchester University Press 1986).

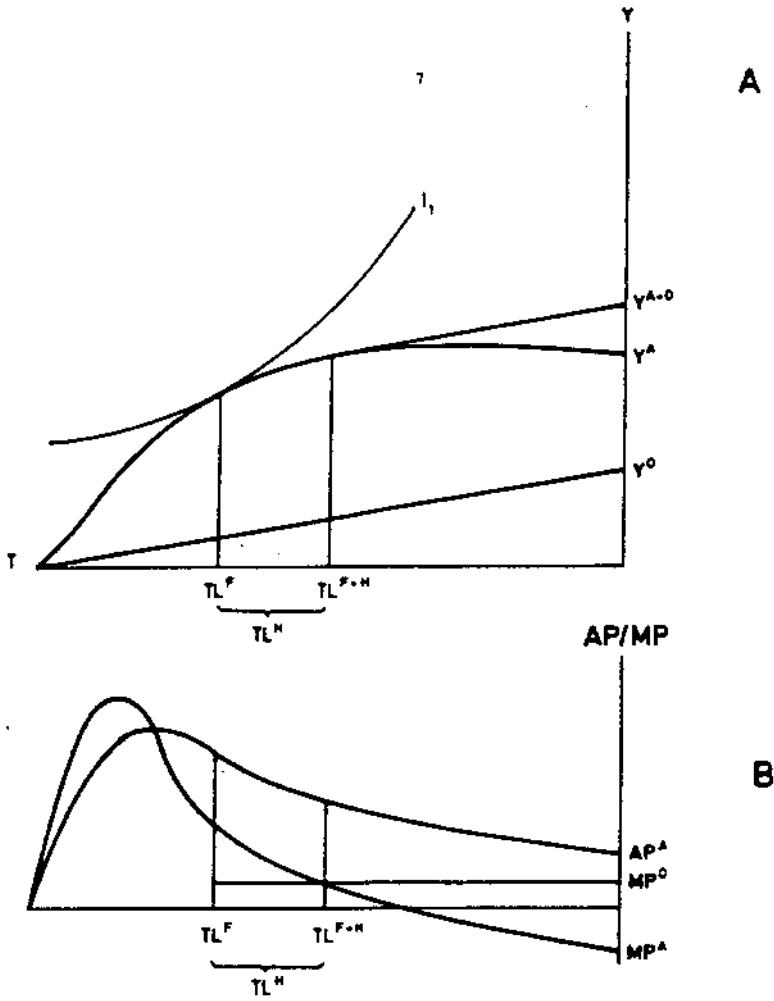
Figure 1



Symbols of Figure 1

- $T$  = time
- $TL^A$  = labour time allocated to agricultural production
- $TL^O$  = labour time allocated to off-farm production
- $TL^{A+O}$  = labour time allocated to agricultural and off-farm production
- $Y^A$  = agricultural income possibility curve
- $Y^{A+O}$  = farm and off-farm income possibility curve
- $I$  = indifference curve
- $MP^A$  = marginal farm labour product
- $MP^O$  = off-farm wage rate
- $AP^A$  = average farm labour product

Figure 2



Symbols of Figure 2

- $TL^F$  = farm family labour time
  - $TL^H$  = hired labour time
  - $TL^{F+H}$  = family and hired labour time
- (see also figure 1)

of long-term dynamic adjustment of farms sizes, this also means that under such conditions it is more efficient to allocate farm family labour to such off-farm employment instead of enlarging the size of farms by capital investment, buying or renting farm land and allocating more family or hired labour to larger farms.<sup>17</sup> Of course, if efficiency in agriculture is increased relative to wage rates due to improved agricultural terms of trade or technological innovations in farm production and enlargement of farms, the reverse will happen, so that labour input in agriculture will be increased.

By applying such theoretical deductions concerning these different options of adjustment of farm labour input, the following conclusion can be drawn. In France, farm labour has been reallocated to off-farm employment more than to agricultural production because industrial wage rates have been relatively high. In Britain, however, it was more efficient to enlarge farm sizes and to hire wage labour in addition to family labour because wage rates have been relatively low compared to marginal and average farm labour product as we have demonstrated in figure 2. Therefore, in Britain farms grew through renting of land, whereas in France, the number of farms was almost unchanged or only rose due to fragmentation of farms as has been observed in other European countries such as Germany. However, adjustment in the number and size of farms in France and corresponding reallocation of farm labour to off-farm employment may not be interpreted as an outcome of low labour productivity in French agriculture compared to Britain, but only as the comparative advantage of a reallocation of farm labour to off-farm

<sup>17</sup> This can be simply demonstrated by turning the non-farm income possibility curve  $Y^0$  of figure 1 to the left, so that the curve will have a steeper course. As a consequence of relative higher wage rates, family labour input in farm production will *ceteris paribus* be reduced and off-farm employment enlarged. See, for a more detailed analysis GÜNTHER SCHMITT, "Was besagen eigentlich agrarsektorale Einkommens und produktivitätsmaßstäbe?" *Zeitschrift für Wirtschaft und Sozialwissenschaften* 108 (1988), pp. 71-98.

activities compared to an enlargement of farms and labour input. Therefore, we have not to take refuge in different "preferences" of French farmers compared to British farmers. Different types of adjustment of French as well as of British agriculture seem, in fact to be fully consistent with rationality of economic decisions by British and French farmers.

#### 4. French and British Agricultural Adjustment in the Nineteenth Century and the "Agrarian Question"

Karl Marx was, as is well-known, very much convinced that due to technological innovation agriculture in a capitalist society is subject to the concentration of farms in the same way that non-farm sectors are subject to concentration. Small family farms would be absorbed by larger farms and farm family labour would be forced to move to cities and to work in industry as the proletariat, subject to exploitation by capitalists. Such a view was already pronounced in the Communist Manifesto of 1848, but more fully described and explained in the first volume of Marx's "Das Kapital", published in 1867 and based on his thorough analysis of British agriculture in that period. Already in his inaugural lecture to the International Association of Workers in 1864, he explained that by analyzing the number of landowners in England and Wales, this number has decreased "from 16,934 persons in the years 1851 to 15,066 in the year 1861", so that the "concentration of land ownership has increased by 11 percent within ten years".<sup>18</sup> However, during the following decades, Marx's view was heavily criticized by numerous social

<sup>18</sup> See for a more detailed review of Marx's position vis-à-vis agriculture as well as for a review of the Agrarian Question especially HANS GEORG LEHMANN, *Die Agrarfrage in der Theorie und Praxis der deutschen und internationalen Sozialdemokratie. Vom Marxismus zum Revisionismus und Bolschewismus Tübinger Studien zur Geschichte und Politik* Nr. 26 (Tübingen: J.C.B. Mohr, 1970).

democrats, especially by Karl Kautsky<sup>19</sup> and Eduard David.<sup>20</sup> With respect to Germany, Kautsky came to the conclusion that "the number of large farms has not changed, the small farms have not been absorbed by these large farms" (p. 193). David (p.51) had even ascertained with respect to Germany, that "the most remarkable characteristic of the overall picture: the growth of the number of small farms, and the retreat of larger farms is continuing unweakened". The reason for such a structural change in agriculture, quite different to Marx's conclusions, has been seen by Kautsky in the growth of off-farm activities by members of farm families in addition to agricultural activities on their small farms. He devoted 20 pages (pp. 174-193) to presenting empirical evidence of numerous types of various off-farm activities by farm families which he and other authors observed, especially in Southern Germany. He, therefore, concluded that off-farm employment of farm families would steadily grow due to industrialization and to "the increasing difficulties of agriculture producing farm products" (p. 194). As a consequence, farm families would be proletarianized by their increasing employment in industry but without giving up their small farms. In this way, social changes in agriculture would produce similar results to those predicted by Marx although this would happen not by concentration of farms and destruction of peasant farms, but by expansion of off-farm employment of farmers who would still remain farmers. Such a view is partly in correspondence with that of Werner Sombart<sup>21</sup> who explained that the growth of

<sup>19</sup> KARL KAUTSKY, *Die Agrarfrage Eine Übersicht über die Tendenzen der modernen Landwirtschaft und die Agrarpolitik der Sozialdemokratie* (Stuttgart: J.H.W. Dietz, 1988).

<sup>20</sup> EDUARD DAVID, *Socialismus und Landwirtschaft Erster Band Die Betriebsfrage* (Berlin: Verlag der Socialistischen Monatshefte, 1903).

<sup>21</sup> WERNER SOMBART, *Der moderne Kapitalismus, Dritter Band Das Wirtschaftsleben des Hochkapitalismus Erster Halbband* (München und Leipzig: Duncker and Humblot, 1928). Sombart supported his view with empirical evidence for England, Germany and other European countries. He was also convinced that due to a concentration of industry in urban areas off-farm employment of farm population would steadily lose ground

population was also accompanied by a growth of rural population. Because cities were unable to absorb a growing rural population, and land available for agricultural activities of that rural population was scarce, "the lower strata of that population, landless people and small farmers were forced to use their labour for industrial activities in order to prevent depression of their standard of living" (p. 339).

Kautsky's and Sombart's view are also in line with that of Chayanov.<sup>22</sup> With respect to our problem, it has to be said that empirical evidence presented by all three authors support the hypothesis that adjustment of agriculture in continental Europe and especially in France was directed to a large extent towards off-farm-employment of agricultural "surplus" labour. In Britain, however, structural adjustment was directed towards concentration of farms and hiring non-family labour on larger farms because such a type of adjustment was a more efficient one as compared to adjustment to be observed in France. Therefore, it is not astonishing that in now developing, densely populated countries in Asia and Africa off-farm resource use of farm population is of great importance and still growing, as is reported by increasing empirical evidence.<sup>23</sup>

With respect to the Agrarian Question, it has to be stated that, first, there is no definitive answer to the question as Marx and the other participants of that discussion believed. Farmers react to pre-

(pp. 339-545). However, as more recent statistics reveal, in all Western European countries the share of members of farm household with gainful off-farm employment was and is still increasing.

<sup>22</sup> Chayanov (op. cit. pp. 101-110) has presented and mentioned numerous statistical data supporting off-farm employment of Russian peasant farms. These data, in fact, have stimulated him in his search for an economic explanation which he has found in his theory of peasant farms. In his "Einleitung" of his "Lehre" (not reprinted in the revised edition of 1925) Chayanov is referring to that discussion of the Agrarian Question by saying that "results achieved do not justify a decisive answer. We are inclined to attribute this to a false question" (p. 5 my translation G.S.).

<sup>23</sup> Such evidence for developing as well as developed countries is presented in GÜNTHER SCHMITT, "What About Disguised Unemployment..." op. cit. (see footnote 11).

vailing economic conditions in a rather rational way, so that concentration of farms may happen as well as deconcentration because for farmers it may be more efficient to expand off-farm employment instead of farms sizes.<sup>24</sup> Adjustment of French agriculture of the nineteenth century most likely followed such a path of reallocation of farm labour to off-farm employment, while for British agriculture it was more efficient to enlarge farms and substitute family labour by hired labour. Marx's "answer" to the Agrarian Question, therefore, was mainly based on structural adjustment to be observed in British agriculture, while Kautsky's "answer" was a reflection of adjustment of agriculture in continental Europe. However, none of the participants of the discussion of the Agrarian question were aware of the fact that depending on prevailing economic and agricultural conditions both "answers" to that question are possible.

## 5. Farm Labour Productivity and Economic Development

It has to be recalled that labour productivity in French agriculture in the XIXth century has been measured by O'Brien and Keyder in two different ways. First, labour productivity has been estimated by applying the conventional method of "dividing the output of one sector by the labour force employed in that sector" (p. 91). Results of such a procedure are represented by Nardinelli (p. 434) and are subject to his theoretical attempt to explain intersec-

<sup>24</sup> An extreme example of agriculture's adjustment towards off-farm employment of farm labour can be found in Japan. Whereas the size and structure of Japanese farms has been almost unchanged since the turn of his century, farm labour has been permanently reallocated to off-farm activities. Whereas in 1900 70 percent of farms were full-time farms, in 1985 only 14 percent of farms were still full-time farms. See GERHARD ANDERMANN and GÜNTHER SCHMITT, "Japan Agrarwirtschaft unter dem Druck eines vehementen wirtschaftlichen Wachstums. Der Weg der Landwirtschaft in den Nebenerwerb". *Agrarwirtschaft* 38 (January 1989), pp. 13-26.

toral differences in France and Britain as well as differences in the level of agricultural labour productivity between both countries, which have been already discussed.

O'Brien and Keyder, however, were well aware of the fact that "especially for France... the work force in agriculture was larger in absolute terms and contained a higher proportion of females and child labour. It is also likely that a higher share of industrial output in France was in fact produced by workers classified as agricultural labour in official statistics" (p. 95). In fact O'Brien and Keyder did mention the problems of classification of farm labour already discussed by Kuznets as well as that of off-farm employment of farm labour discussed by Kautsky, Chayanov and Sombart as well as Kuznets.<sup>25</sup> However, O'Brien's and Keyder's analysis of French farm labour productivity did not consider the "industrial output produced by workers classified as agricultural labour".

Like Kuznets, O'Brien and Keyder calculated "hypothetical labour productivity in French agriculture and in commodity production" by estimating hypothetical labour input in French agriculture. Labour input was simply estimated by subtracting "surplus" labour employment in agriculture from farm labour according to official statistics. Agricultural surplus labour has been defined by these authors as "the difference between the actual number of hectares per worker and the number of hectares per worker farmed in Great Britain during the same decade". According to such estimates, "hypothetical" farm labour productivity in France achieved by labour input adjusted to labour input in British agriculture, and, hence, excluding "surplus labour"<sup>26</sup> is much

<sup>25</sup> With respect to the problem of the "higher proportion of females and child labour" mentioned by O'Brien and Keyder and analyzed by Kuznets see footnote 7. With respect to off-farm employment of farm labour, analyzed and discussed also by Kuznets see the introduction of this article.

<sup>26</sup> "Surplus" labour in French agriculture as roughly estimated by O'Brien and Keyder by this method corresponds to off-farm labour input of farm labour'  $TL^0_1$  in figure 1. Of course this method which transfers the land-man-ratio in British agricul-

higher and in industry is somewhat smaller as measured by the conventional method. The authors, therefore, conclude that "comparisons between the hypothetical levels of labour productivity and their real levels show that the overall gap in the productivity of labour employed in the commodity production in Britain and France would have disappeared, that the superior productivity of British agriculture would have persisted..." (p. 98).

So far such a "hypothetical" calculation seems, in fact, to be less hypothetical and more realistic than O'Brien and Keyder are willing to concede. According to my analysis of French agriculture's labour allocation discussed in paragraph 1, an adjustment of farm labour input to corresponding farm output does result in a narrowing of intersectoral productivity differences in France and a narrowing in the productivity gap between the French and the British agriculture. Therefore, O'Brien and Keyder's hypothetical calculation is, at least, in the right direction.

However, in addition to their hypothetical calculation of labour productivity in French agriculture and a comparison of labour productivity with "real" labour productivity in industry O'Brien and Keyder have estimated hypothetical "labour productivity in commodity production in France" (p. 99). According to their table 4.7, "labour productivity in commodity production" has been estimated by "agricultural output plus hypothetical industrial output  $\div$  hypothetical labour force in industry  $\times$  actual productivity of labour employed in industry divided by hypothetical labour force engaged in commodity production". The "hypothetical labour force in industry", however, was "calculated as equal to the actual labour force employed plus half the surplus labour hypotheti-

ture, is a rather crude one because the structure of French agriculture differs from the structure of British agricultural output, which can easily be seen with respect to labour-intensive production of wine by French agriculture. Therefore, farm output measured in monetary terms per (British) farm worker would have been a better base for such "hypothetical" calculation.

cally released from agriculture. The other half is assumed to be employment in services" (p. 99).

According to such a procedure, labour productivity in France is below "actual" labour productivity in industry as measured by the conventional method. It has to be recalled that commodity production included agricultural production, which is the reason why productivity in commodity production is less than productivity in industry, although agricultural surplus labour has been added to industrial production and weighted by actual "productivity of labour employed in industry".

O'Brien and Keyder are interpreting their calculation as a "model" being "based upon industry's capacity to absorb surplus labour from agriculture at a constant level of productivity and agriculture's capacity to grow at a constant rate with a smaller labour force" (p. 98). Such "comparisons" lead them to the conclusion "that structural transformation would have been almost sufficient to eliminate the gap in per capita income between the two economies". Consequently, the authors presume that such a "rough guess... might be taken as a rough measure of the 'loss' sustained by French society for failing to undertake more rapid structural transformation between 1780 and 1914". And: "That loss was probably not inconsiderable, and French retardation can certainly be conceived in terms of an unrealized potential for economic growth derived from a failure to transfer labour from a low productivity agricultural sector into industry" (p. 98).

It is quite obvious that such an assessment is based on the concept of disguised unemployment in French agriculture and on an assumption similar to the one Kuznets made in his "illustrative calculation" which we mentioned before, according to which the level and growth of national income will be higher provided that agricultural surplus labour is transferred to and gainfully employed in industry. Despite their caveat — "it is obvious enough, but a rise in the share of a country's labour force allocated to industry does not

necessarily produce higher levels of development" (p. 96) — O'Brien and Keyder seem to be much impressed by Kuznets' conclusion that factual intersectoral productivity differences in France as estimated by conventional methods are the outcome of agricultural surplus labour and that such surplus labour is due to institutional constraints, and not to "classification biases" of the farm labour force in France.<sup>27</sup> Kuznets has based this assumption, as already mentioned, on the "conclusion that these classification biases would have to be improbably, indeed impossibly, great to have a significant effect on the intersectoral inequalities that have been established" (p.234). Therefore, the "hypothetical" labour productivity in France, estimated by O'Brien and Keyder is seen as a model which only can demonstrate the loss of level and growth of the French economy which is due to structural retardation of agriculture and is explained by Nardinelli by French farmers' specific preferences for "non-pecuniary benefits from agriculture" (p. 431).

My conclusion, however, is quite a different one. According to the household-model applied to French agriculture, I am convinced that, first, agricultural labour input defined as surplus labour has been gainfully employed in off-farm and household production. Therefore, estimates and figures of the French agricultural labour force are misleading because farm labour allocated to off-farm and household production is not taken into account. It follows, second, that labour productivity in French agriculture is underestimated relative to (overestimated) productivity in French industry as well as relative to labour productivity in British agriculture. Third, labour productivity in British agriculture is estimated,

<sup>27</sup> My assumption that O'Brien and Keyder are heavily influenced by Kuznets when they reject their hypothetical estimates of labour productivity in French agriculture — but not their estimates of labour productivity in commodity production — as being more realistic compared to "real" labour productivity in agriculture is based on the fact that his book on "Economic Growth of Nations" (see footnote 2) is quoted several times in O'Brien's and Keyder's book.

however, rather correctly due to the fact that figures on the British agricultural labour force are realistic because in British agriculture, off-farm employment and, hence, "surplus labour" does not play an important role if any at all. Fourth, because "surplus labour" in French agriculture is engaged in off-farm as well as in household production efficiently, there are no gains in productivity and national income which could be mobilized by a transfer of that surplus labour to industry. Therefore, figures concerning the level and growth of the French economy during the nineteenth century are correct and should not be used for a calculation of losses "sustained by French society for failing to undertake more rapid structural transformation between 1780 and 1914" as O'Brien and Keyder maintain (p. 98). Finally, it has to be asserted that traditional economic theory is a very powerful instrument for an explanation of prevailing economic structures and structural adjustment and no retreat to non-economic factors such as [different] specific preferences between French and British farmers is needed nor justified, provided, of course, that relevant economic theories are applied. Consequently, farms in France and Britain as well as in other countries of the non-socialist world should be analyzed in terms of farm households and not as firms.

