

Guns and Butter – But No Margarine: The Impact of Nazi Agricultural and Consumption Policies on German Food Production and Consumption, 1933-38

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Abstract

The implementation of the Nazi ideology into agricultural institutions and the suppression of private consumption had a stronger impact on German food production and consumption than has hitherto been thought. We argue that the reforms of agrarian institutions reduced the growth of total factor productivity in German agriculture between 1933 and 1938 considerably. This exacerbated the restrictive effects of prioritizing the armaments industry to the detriment of the consumer goods industry and private consumption. As a consequence of less efficient food production and of consumption constraints, German consumers were forced to a diet and thus to a material standard of life that were much more frugal than national income figures suggest.

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1. Introduction

In the second half of the 1930s Germany experienced high economic growth rates and a rapid decline of unemployment that were unparalleled in Europe. Contemporary observers, both inside and outside Germany, believed to witness a *Wirtschaftswunder* (economic miracle).¹ Even after the defeat of the Nazi regime, Germany's economic policy received attention. At a time when Keynesian ideas began to dominate the thinking of economic policy makers the apparent success of the Nazis' interventionist policy between 1933 and 1939 was seen as a case study which might serve as a possible toolbox for democratic planners as well and was thus worth to be analyzed thoroughly.²

It became quickly clear that the Nazi economic policy had, if at all, few to offer to democratic policy makers, and the assessment of its success was controversial. Many scholars followed the sceptical judgment of the Swiss economist René Erbe who showed that the economic upturn was accompanied by a reallocation of resources from consumer goods production to armaments production and was financed by enormous debts.³

This view, which is by and large shared by most economic historians of Nazi Germany today, has proved to be difficult to reconcile with the fact that a clear majority of the German population seemed to approve the new regime. One argument that has been repeated ever since and which even today contemporary witnesses seldom fail to mention is that the improved provision of material goods contributed to this positive assessment of a murderous regime. This contention found authoritative support by a study of the American economist Burton Klein who had served for the United States Strategic Bombing Survey under John K. Galbraith in the mid-1940s. In his analysis of the German rearmament program of the 1930s he concluded that

"in the prewar period, the German economy produced both 'butter' and 'guns' – much more of the former and much less of the latter than has been commonly assumed. By 1937, civilian consumption, investment in consumer goods industries, and government

¹ Cf. Hans E. Priester (1936), *Das deutsche Wirtschaftswunder*, Amsterdam: Querido; Wilhelm Prion (1938), *Das deutsche Finanzwunder. Geldbeschaffung für den deutschen Wirtschaftsaufschwung*, Berlin-Willmersdorf: Franke; Claude W. Guillebaud (1939), *The Economic Recovery of Germany from 1933 to the Incorporation of Austria in March 1938*, London: Macmillan.

² Cf., e.g., Guillebaud (1939), pp. 232f., 265; Otto Nathan and Milton Fried (1944), *The Nazi Economic System. Germany's Mobilization for War*, Durham: Duke University Press, pp. vi, 368; Samuel Lurié (1947), *Private Investment in a Controlled Economy. Germany, 1933-1939*, New York: Columbia University Press, p. vii. See also Wesley C. Haraldson and Edward F. Denison (1946), *The Gross National Product of Germany 1936-1944* (United States Strategic Bombing Survey, Overall Economic Effects Division, Special Paper 1), Washington, DC: mimeo; Burton Klein (1958), *Germany's Economic Preparations for War*, Cambridge, Mass.: Harvard University Press, p. v.

³ René Erbe (1958), *Die nationalsozialistische Wirtschaftspolitik im Lichte der modernen Theorie* (Basle Centre for Economic and Financial Research, B.2), Zurich: Polygraphischer Verlag. For a revisionist view concerning Germany's indebtedness, see Albrecht Ritschl (2002), Deficit Spending in the Nazi Recovery: A Critical Reassessment, *Journal of the Japanese and International Economy*, 16, pp. 559-582.

nonwar expenditures equalled or exceeded previous peak levels. [...] Until 1936, rearmament and increased civilian consumption could be achieved simultaneously by drawing on unemployed resources. Indeed, the rearmament deficits had a stimulating effect on consumption. There was no conflict, therefore, in having both more 'butter' and more 'guns'. In the years 1937 and 1938, however, the German economy was operating at near full employment, and a sizable increase in armament expenditures could have been achieved only at the expense of some decline in civilian consumption. [...] It appears, however, that the German government was unwilling to ask for such sacrifices."⁴

The findings of subsequent research on German agriculture were in line with this assessment. The main subject of this research was the *Reichsnährstand* (Reich Food Corporation) founded by the Nazis in 1933 which was in charge of regulating German agricultural production and distribution and soon started a much propagated *Erzeugungsschlacht* (battle for production). Both John Farquharson and in particular Clifford R. Lovin argued that the Nazi agricultural policies were successful in augmenting food production and increasing national self-sufficiency.⁵ Lovin concluded that

"the increase in production undeniably occurred, and the real question is whether or not the National Socialists can correctly take the credit for the movement toward nutritive independence. In general the answer to this must be yes. [...] If a final assessment of the *Reichsnährstand* rests entirely on material bases, then it must be adjudged successful. The market control brought increased agricultural income and productivity as well as accelerated rationalization in agriculture."⁶

These findings were taken up eagerly by German historians when it came to a reassessment of the Nazi period in the course of the 'modernization' debate. At the core of the discussion was the question whether the Nazi regime was 'modern' in the sense that it was in many respects not a deviation from larger 20th century trends. In this respect, a number of historians emphasized in the 1980s that the standard of living increased in the course of the 1930s.⁷ In a leading text book on the period, the historian Hans-Ulrich Thamer argues that among "the assets of the economic and social policies of the regime were the reduction of unemployment and the enhancement of the living standard".⁸

⁴ Klein (1958), pp. 76, 79.

⁵ Clifford R. Lovin (1969), *Agricultural Reorganization in the Third Reich: The Reich Food Corporation (Reichsnährstand)*, *Agricultural History*, 43, pp. 447-461; John E. Farquharson (1976), *The Plough and the Swastika: The NSDAP and Agriculture in Germany 1928-45*, London and Beverly Hills: Sage, pp. 176f.

⁶ Lovin (1969), pp. 460f.

⁷ Cf. Hans D. Schäfer (1981), *Das gespaltene Bewußtsein. Über deutsche Kultur und Lebenswirklichkeit 1933-1945*, Munich et al.: Hanser, pp. 116-119; Michael Prinz (1986), *Vom neuen Mittelstand zum Volksgenossen. Die Entwicklung des sozialen Status der Angestellten von der Weimarer Republik bis zum Ende der NS-Zeit*, Munich: Oldenbourg, pp. 187-196; idem (1994), Die soziale Funktion moderner Elemente in der Gesellschaftspolitik des Nationalsozialismus, in idem and Rainer Zitelmann (eds.), *Nationalsozialismus und Modernisierung*, 2nd edn., Darmstadt: Wissenschaftliche Buchgesellschaft, pp. 297-327, here pp. 316f.

⁸ Our translation from Hans-Ulrich Thamer (1998), *Verführung und Gewalt. Deutschland 1933-1945*, 3rd edn., Berlin: Siedler, p. 511 (first edition 1986).

This positive assessment of Nazi agricultural and consumption policies has recently found support by Werner Abelshauer and, in particular, by Götz Aly. While Abelshauer is careful enough to note that "the German diet was remarkably modest", his provocative conclusion that the Nazis were "largely successful" in producing both "butter and guns" has evoked objections.⁹

Following Erbe, Christoph Buchheim has termed the Nazi economic upturn "distorted growth".¹⁰ The discussion between Abelshauer and Buchheim illustrates a crucial problem in assessing the performance of Nazi economic policies which shows up in other comparative work on this period as well. While Abelshauer compares the standard of living in the late 1930s with that of the trough of the crisis years, 1932 (as did the Nazi propaganda, official German statisticians and probably the common consumers of the 1930s as well), Buchheim's reference period is the late 1920s when Germany's economy experienced a short—though financed by massive foreign debt inflow—economic boom. Thus his assessment of the material living standard in the second half of the 1930s is much more critical than Abelshauer's.

Buchheim's stance is supported by the results of Jörg Baten and Andrea Wagner who have supplied evidence from social and medical data. Whereas the biological standard of living improved in Western European countries during the 1930s, it stagnated in Germany.¹¹ In addition, research on the German agriculture has refuted the positive assessments of Lovin and Farquharson. By comparing agricultural output and input of the 1930s with that of the first third of the 20th century, Gustavo Corni argued that

"[...] during the seven years of National Socialist agrarian policy that we have examined, the battle for production did not even reduce the food balance deficit enough to satisfy the growing demands of the consumers and to permit a re-allocation of available resources. Although modernisation and the process of intensifying production continued, they did so at a slower rate than in the past and with fluctuations and weaknesses."¹²

Yet the latest contribution to the debate on the welfare effects of the Nazi economic and consumption policies carries the revisionist view to extremes. In a recent book, the historian Götz Aly argues that the Nazi regime bribed ordinary Germans by redistributing the wealth taxed

⁹ Werner Abelshauer (1998), *Germany: Guns, Butter, and Economic Miracles*, in Mark Harrison (ed.), *The Economics of World War II. Six Great Powers in International Comparison*, Cambridge: Cambridge University Press, pp. 122-176, quotes pp. 147f.; idem (1999), *Kriegswirtschaft und Wirtschaftswunder. Deutschlands wirtschaftliche Mobilisierung für den Zweiten Weltkrieg und die Folgen für die Nachkriegszeit*, *Vierteljahrshefte für Zeitgeschichte*, 47, pp. 503-538, here p. 525.

¹⁰ Christoph Buchheim (2001), *Die Wirtschaftsentwicklung im Dritten Reich – mehr Desaster als Wunder. Eine Erwiderung auf Werner Abelshauer*, *Vierteljahrshefte für Zeitgeschichte*, 49, pp. 653-664; see also Mark Spoerer (2005), *Demontage eines Mythos? Zu der Kontroverse über das nationalsozialistische "Wirtschaftswunder"*, *Geschichte und Gesellschaft*, 31, pp. 415-438.

¹¹ Jörg Baten and Andrea Wagner (2003), *Autarchy, Market Disintegration, and Health: The Mortality and Nutritional Crisis in Nazi Germany, 1933-1937*, *Economics and Human Biology*, 1, pp. 1-28.

¹² Gustavo Corni (1990), *Hitler and the Peasants. Agrarian Policy in the Third Reich, 1930-1939*, New York et al.: Berg, p. 174.

from the German rich and looted from the peoples in the occupied territories and from European Jewry. His main argument, the securing of political consent by redistribution, is expressed in the book's title, *Hitlers Volksstaat* (Hitler's people's state).¹³ While Aly's economic arguments were heavily criticized by Adam Tooze and Mark Spoerer,¹⁴ the public debate—the book was widely discussed in the media and saw its fifth edition two months after initial publication—demonstrates the relevance of the issue.

In this paper, we systematize the findings of different lines of recent research on the production and consumption of consumer goods and add new evidence. While earlier research has focused on describing the *policies* that affected consumer goods production and consumption we assess the *results*. We will focus our analysis on food products as they were to a lesser extent affected by quality deterioration than other consumer goods. On the supply side we analyze to what extent institutional changes that resulted from the implementation of Nazi ideology into German agriculture affected productivity in this sector. On the demand side we investigate in how far the Nazis' policies—partly inefficient, partly restrictive—affected actual food consumption. For both analyses, we take the late 1920s and, as a counterfactual for the 1930s, the 1950s as benchmark periods. In these two periods, though certainly not free of state intervention, food production and in particular food consumption were much less influenced by interventionist government policies than in the 1930s. It is this long-term perspective that enables us to distinguish between long-term trends and short-term deviations caused by Nazi policies in the Third Reich.

As a result, we find that in the 1930s both food production and food consumption suffered from policy-induced shortcomings that were far larger than hitherto thought. German agriculture was not only much less productive in the 1930s than in the 1950s, but also much less dynamic than in the 1920s. This contributed—among other factors—to the remarkable frugal diet that German consumers had to settle for. Given the GDP levels of the late 1930s, they were way off the food consumption levels attained in the early 1950s, when GDP was about the same but production less regulated and consumption unconstrained. These findings, which pertain to most elementary issues at a time when typical worker households still had to devote 45 per cent of their income to buying food, leave little room for interpreting the Nazi period as 'modern'.

¹³ Götz Aly (2005), *Hitlers Volksstaat. Raub, Rassenkrieg und nationaler Sozialismus*, Frankfurt on Main: Fischer.

¹⁴ See for criticism from an economic history perspective: J. Adam Tooze, Einfach verkalkuliert, *taz Magazin*, no. 7613, 12 March 2005 (<http://www.taz.de/pt/2005/03/12/a0289.1/text>); Review Spoerer on Aly in *H-Soz-Kult*, 26 May 2005 (<http://hsozkult.geschichte.hu-berlin.de/rezensionen/2005-2-143>); URLs checked 1 June 2006.

2. Nazi Policies Affecting Consumer Goods Production and Consumption: An Overview

It is widely accepted now that the Nazis headed for war right after the takeover of power in January 1933. While they usually took, quite unexpected, a pragmatic approach and were far less anti big business as they had promised their voters before 1933,¹⁵ agriculture was the only economic sector in which the Nazis implemented their ideological aims at large scale. The two most important institutional changes were the *Reichsnährstand* and the *Reichserbhofgesetz* (Hereditary Farm Law). Both new institutions decreased the scope of action of the individual farmers. The *Reichsnährstand* regulated prices and production programs by direct interventions which considerably constrained pioneer farmers' possibilities to introduce innovative products or production methods according to their private knowledge, and therefore probably resulted in lower productivity growth. The *Reichserbhofgesetz* prohibited the owners of the so-called *Reichserbhöfe* (hereditary farms) both to take on mortgage loans and to pay out co-heirs. In a dynamic perspective, these later regulations decreased the farmers' factor endowment by causing a decline in agricultural credits needed to finance modernization and an increase in the rural exodus of unpaid family workers, respectively.¹⁶

The prioritization of armaments production was constrained by two qualifications which were intertwined with each other. Firstly, in the beginning of the Third Reich, the popularity of the regime was inseparably attached to its ability to reduce unemployment which, according to the still too conservative official numbers, attained more than 6 million persons (34 per cent) in the winter of 1932/33.¹⁷ While this problem was overcome by 1936 when full employment was achieved, the second one proved to be persistent and of increasing importance the less unemployed were still on the dole. After several years of economic hardship, households wanted to have their consumption needs fulfilled. The regime's trade-off between vigorous rearmament and onerous consumer satisfaction led to a policy which has been termed by Abelshäuser "as much butter as necessary, as many guns as possible".¹⁸

In this conflict between the consumption needs of private households on the one side and those of the state on the other, an obvious measure was to encourage savings. The German state,

¹⁵ Cf. Mark Spoerer (2001), *Industrial Profitability in the Nazi Economy*, in Christoph Buchheim and Redverd Garside (eds.), *After the Slump. Industry and Politics in 1930s Britain and Germany*, Frankfurt/Main et al.: Lang, pp. 53-80; Christoph Buchheim and Jonas Scherner (2006), *The Role of Private Property in the Nazi Economy: The Case of Industry*, *Journal of Economic History*, 66, pp. 390-416.

¹⁶ Cf. Farquharson (1976), pp. 71-85, 107-123; Corni (1990), pp. 66-86, 143-155.

¹⁷ Dan P. Silverman (1998), *Hitler's Economy. Nazi Work Creation Programs, 1933-1936*, Cambridge, Mass.: Harvard University Press, pp. 251, 253.

¹⁸ Abelshäuser (1998), p. 131.

however, was by far the largest debtor and thus was not willing to increase the interest rate. Hence the only means to increase household savings was to employ moral suasion which of course was by far not sufficient to absorb the increasing purchasing power. Despite massive propaganda, the savings-income ratio was remarkably low in the mid and late 1930s.¹⁹ As a consequence, the German authorities increasingly relied on measures that were intended to satisfy the level of consumer needs that was seen as sufficient for sustaining political power with as little resources as necessary.

Figures 1a and 1b illustrate these measures in a stylized way. The commodity in figure 1a is 'rationed' in the sense that the German authorities were not willing to have it supplied in the quantity at which consumers' willingness to pay equals producers' willingness to supply. In contrast, a number of commodities can be termed 'recommended' in the sense that the authorities tried to have the households consume them rather than 'rationed' goods. Typical 'rationed' goods were foodstuffs that had to be imported, while 'recommended' goods could be produced with domestic resources that were of no strategic importance for the armaments production.

[Insert Figures 1a and 1b about here]

The curves in bold lines indicate the situation in early 1933 when, after three consecutive years of deflation, low prices (p^*) cleared the markets. In the subsequent years, employment increased which shifts the demand curve to the right (A in Figures 1a and 1b). Right from the beginning the government tried to persuade consumers to substitute 'recommended' goods like rye bread, potatoes, fish, apples, sugar, marmelade and rayon textiles for 'rationed' goods like white bread, meat, animal fat, tropical fruits or cotton textiles.²⁰ In other words, these measures targeted consumer preferences (B). Less subtle government action incurred surplus costs for producers (C). E.g., a quite bizarre restriction was the enforced intermixture of (dear) butter into (cheap) margarine. This made margarine dearer and less attractive for less affluent consumers. It also affected the supply of butter, itself a rather scarce good, but it helped reducing the import demand of the margarine mills for sun flower oil thereby saving scarce foreign exchange. A

¹⁹ While the average savings-income ratio for the period 1926-29 was 7.0 per cent, the annual figures for 1933-38 are 2.5, 5.0, 5.6, 4.2, 5.4 and 8.2, respectively. Savings (excluding foreigners) from Deutsche Bundesbank, *Geld- und Bankwesen in Zahlen 1876-1975*, Frankfurt on Main: Knapp 1976, p. 4, disposable income from Spoerer (2005), pp. 436-438. Income data for 1938 include Austria, savings data not. The figure for disposable income in 1938 has thus been transformed to pre-1938 territory by the net national income data in *Statistisches Jahrbuch für das Deutsche Reich* (1941/42), pp. 604f., which are given for both pre-1938 and 1938 territory.

²⁰ Cf. Hartmut Berghoff (2001), Enticement and Deprivation: The Regulation of Consumption in Pre-War Nazi Germany, in Martin Daunton and Matthew Hilton (eds.), *The Politics of Consumption. Material Culture and Citizenship in Europe and America*, Oxford: Oxford University Press, pp. 165-184; idem (2003), "Times Change and We Change with Them": The German Advertising Industry in the Third Reich—Between Professional Self-Interest and Political Repression, *Business History*, 45, pp. 128-147.

grotesque example is the setup of a national whaling fleet that was to deliver the input for train oil, another substitute for sun flower oil.²¹ Even more interventionist measures were direct restrictions on the purchase of input goods, on imports and even on plant investment. Most of these measures have already been described in the seminal works of Otto Nathan, Milton Fried and Samuel Lurié.²² A more detailed look on the textile industry has recently been provided by Gerd Höschle.²³ These restrictions result in a kinked supply curve (D). In contrast, the supply of 'recommended goods' was fostered by subsidies (E). On the aggregate, however, restrictive policies outweighed supportive measures by far.

Had the regime stopped here, the combination of increased demand and curtailed supply on the markets for 'rationed' goods would inevitably have resulted in price increases. Indeed, the prices of many consumer products showed upward tendencies. Hence the Nazis tightened existing price control measures which had been introduced by preceding governments. The story of Nazi price policies is very complicated as a number of conflicting aims had to be reconciled. The most notable aims were, on the one hand, the political imperative to keep prices stable and, on the other, the ambition to increase farmers' incomes, which had suffered in the years of deflation. In a series of articles, André Steiner has traced the history of price controls in the 1930s.²⁴

The picture which emerges from these policies is quite clear. 'Rationed' good markets were characterized by controlled prices (p') below market clearing levels (p°). Since prices were bereft their allocation function, queuing and black markets reduced the excess demand (e) and solved the allocation problem— the Nazis still shied away from officially rationing consumer goods which was not introduced before late August 1939, a few days before the raid on Poland.

While the intense historical research of the past decades has succeeded in describing the policies that affected consumer goods production and consumption, the analysis of the actual effects on the standard of living has remained underdeveloped. In their seminal paper on the biological standard of living, Jörg Baten and Karin Wagner find that several demographic indicators were

²¹ Cf. Birgit Pelzer and Reinhold Reith (2001), *Margarine. Die Karriere der Kunstbutter*, Berlin: Wagenbach, p. 88f.

²² Nathan/Fried (1944); Lurié (1947).

²³ Gerd Höschle (2004), *Die deutsche Textilindustrie zwischen 1933 und 1939. Staatsinterventionismus und ökonomische Rationalität*, Stuttgart: Steiner.

²⁴ André Steiner (2006), Der Weg von der staatlichen Preisüberwachung zur staatlichen Preisbildung. Verbraucherpreispolitik und ihre Konsequenzen für den Lebensstandard unter dem Nationalsozialismus in der Vorkriegszeit, in idem (ed.), *Preispolitik und Lebensstandard. Nationalsozialismus, DDR und Bundesrepublik im Vergleich*, Cologne et al.: Böhlau: pp. 23-85; idem (2006a), Der Brotpreis - ein politischer Preis unter den Bedingungen des NS-Regimes, in Johannes Bähr and Ralf Banken (eds.), *Wirtschaftssteuerung durch Recht im Nationalsozialismus. Studien zur Entwicklung des Wirtschaftsrechts im Interventionsstaat des "Dritten Reichs"*, Frankfurt on Main: Klostermann, pp. 365-420.

quite unfavourable for Nazi Germany compared to their Western neighbours. Moreover, regional shortages of protein supply correlated with increases in infant mortality.²⁵

We believe that the degree of failure of German agricultural policies in Nazi Germany has been underestimated so far. Previous assessments have mostly been based on ideological standards set by the Nazi government, notably in how far the goal of autarchy was achieved.²⁶ We take instead an economic perspective and ask how much German agriculture produced less than it could have done with the given input of production factors, and ask how much German households consumed less than they could have done at the given level of disposable income or even GDP.

3. The Effects of Nazi Agricultural Policies on Productivity in Agriculture

In this section we will argue that the agricultural reforms of 1933/34 considerably decreased the growth of total factor productivity in German agriculture which, in a dynamic perspective, has to be interpreted as an upward shift of the supply curve like C in Figure 1a.

After an unsatisfactory harvest the national socialist minister for agriculture announced the "battle for production" in November 1934. In order to increase agricultural production and, ideally, to achieve autarchy in the food sector, the new agricultural policy strived to increase the input of production factors. Capital input like chemical fertilizer and agricultural machinery was subsidized. The rural exodus should be stopped by social measures. Even the input of land should be increased by the cultivation of bad lands and land reclamation at the coasts. Finally, a number of education programs targeted at increasing the efficiency of the use of available factor resources.

The effects of these measures have been assessed differently. The Nazis emphasised of course the alleged success of their policies and used to compare actual agricultural figures with those of 1932, which was not only the last year of the scorned "liberal capitalist system" but also that of the worst harvest since 1925.²⁷ In his secret memorandum of autumn 1936 that preceded the (second) Four Year Plan, Hitler was far more pessimistic. He did not believe that a further intensification of German agriculture would lead to a considerable increase of production. The only remedy, he argued, was to increase the *Lebensraum* (living space).²⁸ Of course, this verdict of

²⁵ Baten and Wagner (2003).

²⁶ E.g., Dietmar Petzina (1968) *Autarkiepolitik im Dritten Reich: der nationalsozialistische Vierjahresplan*, Stuttgart: DVA, p. 95; idem (1977), *Die deutsche Wirtschaft in der Zwischenkriegszeit*, Wiesbaden: Steiner, p. 150.

²⁷ Cf., e.g., R. Walther Darré (1939), Die ernährungspolitische Lage, *Der Vierjahresplan: Zeitschrift für nationalsozialistische Wirtschaftspolitik*, 3, 1939, pp. 108-110, here p. 110. For harvest yields, see Walther G. Hoffmann et al. (1965), *Das Wachstum der deutschen Wirtschaft seit der Mitte des 19. Jahrhunderts*, Berlin et al.: Springer, p. 318.

²⁸ Denkschrift Hitlers über die Aufgaben eines Vierjahresplans, *Vierteljahrshefte für Zeitgeschichte*, 3 (1955), pp. 204-210, here p. 206.

Hitler has to be seen in the context of his expansion plans, notably that the German military and economy should be prepared for war in four years' time.

As demonstrated in the introduction, historians have supported both the optimistic and the pessimistic view. We believe that past research has neglected two important aspects when dealing with the economic performance of German agriculture under the Nazi regime. First, most assessments of the period from 1933 to 1939 fail to take a broader perspective which would allow to single out the specific contribution of the national socialist agricultural policies in the long term, be they positive or negative (in economic terms).

Second, the analysis so far has focused on output, not on factor mix or on efficiency and productivity. On the one hand, we would like to know how the Nazi agrarian policy influenced the growth of capital intensity (capital/labour) or the decrease of land intensity (land/labour) compared to long-term trends of structural change in German agriculture. On the other hand, the question is still unanswered whether the "battle for production" increased agricultural productivity or, as Corni has assumed, rather slowed down rural modernization.

To answer these questions, we present in the following a long-term quantitative analysis of factor input relations and productivity of German agriculture in the periods of the Weimar Republic (1925-1932), the Third Reich (1933-1938) and the Federal Republic of Germany (1950-1959).²⁹

The opportunities for extensive growth were sparse in German agriculture. There were few possibilities to cultivate new lands and those which were realized proved to be extremely expensive. In effect, the area used for agriculture decreased in the course of the 1930s although the Saarland was reintegrated in 1935. The reason for this was the ever increasing land demand of the military, e.g. for airfields, but also for the newly built *Autobahnen* and as a consequence of city growth.³⁰ In respect to labour and capital, agriculture competed with the demand of manufacturing which usually had privileged access to these scarce production factors, especially since late 1936, when the Four Year Plan came into effect. Hence a lasting increase of agricultural output required intensive rather than extensive growth that is an increase of productivity with those resources that were already available. To conclude, the success of the national socialist agrarian policies should not be rated by the degree of autarchy, which was anyway utopian,³¹ but by the realized increase of productivity.

²⁹ For a more detailed account, see Stephanie Degler and Jochen Streb (2006), *Die verlorene Erzeugungsschlacht: die nationalsozialistische Landwirtschaft im Systemvergleich*, University of Hohenheim, Working Paper.

³⁰ Cf. Corni (1990), p. 165.

³¹ According to Lovin (1969), p. 460, even the minister of agriculture "repeatedly denied that total autarky was his aim".

In principle, there are two approaches to measure productivity. The concept of partial factor productivity relates output to a single production factor. While this concept does not require assumptions on the production function and is calculated easily, it is not possible to separate the effects of quantity and quality. If, e.g., additional machinery substitutes labour, measured labour productivity increases though no increase of technical progress has taken place, but just an increase of capital intensity.

Thus we use the concept of total factor productivity which was developed by Robert Solow in the 1950s but has not yet been applied to measure the development of German agriculture.³² Agricultural net output O depends on the four production factors labour (L), land (T), capital (C) and technical progress (P). The functional relation is of type Cobb-Douglas.

$$(1) O = f(P, L, T, C) = P \cdot L^\alpha \cdot T^\beta \cdot C^\gamma, \text{ with } \alpha + \beta + \gamma = 1.$$

Under the assumptions of constant economies of scale the production elasticities α , β and γ add up to unity. Expressed in growth rates and transformed, (1) becomes:

$$(2) w_p = w_o - (\alpha \cdot w_L + \beta \cdot w_T + \gamma \cdot w_C)$$

If we further that the markets are perfectly competitive the production elasticities correspond to factor income shares. Finally, under the assumption that technical progress is neutral, all variables on the right hand side of equation (2) become, in principle, empirically observable. The growth of total factor productivity on the left hand side is usually interpreted as autonomous technical progress which encompasses the increase of the economic use of relevant knowledge on plant and animal production, fertilizers and pesticides (biological-chemical progress), on agricultural machinery and storage (mechanical-technical progress) and on management techniques and cultivation methods (organisational progress). In addition, the residual variable w_p captures all other impact factors on production that are not attributed to an increase of the material production factors L , T or C .³³ Among these are human capital, sex proportions of persons working in agriculture, climatic effects and measurement error.

We will also report partial productivity measures, in particular land and labour productivity, because these were the ratios that contemporary national socialist experts looked at. Before World War II, the German experts saw the production factor land as the decisive bottleneck and thus favoured an increase of land productivity. After the expansion eastwards land seemed to be

³² Robert M. Solow (1957), Technical Change and the Aggregate Production Function, *Review of Economics and Statistics*, 37, pp. 312-320.

³³ Cf. Edward F. Denison (1967), *Why Growth Rates Differ: Postwar Experience in Nine Western Countries*, Washington, D.C.: Brookings, pp. 279-289.

abundant so that the paradigm changed and labour productivity came into the focus of the planners.³⁴

We now turn to a short description of the data. Agricultural output, measured as net value added, has been calculated by Hoffmann et al. and is reproduced in Figure 2.³⁵

[Insert Figure 2 about here]

The strong fluctuations of the interwar period are primarily driven by climatic events that influenced plant production. Harvest yields were low in the years 1926, 1932 and 1936 and high in 1933 and 1937. The geometric means of the growth rates for these three periods are 3.23 per cent for the Weimar Republic (1925-1932), 2.12 per cent for the Third Reich (1933-1938) and 2.18 per cent for the Federal Republic (1950-1959). Given the aggressive rhetorics of the Nazis ("battle for production") this result is not very impressive. Yet, it appears even worse if we compare the growth of the output with the development of the factor inputs.

Information about the development of agricultural capital stocks are also taken from Hoffmann et al.,³⁶ land data can be found in the annual statistical yearbooks of the German Reich and the Federal Republic of Germany. The time series of the input factor labour is based on official data of the occupational census years of 1925, 1933, 1939 and 1950. For the intermediate years we calculate the missing data by the growth rates given by Hoffmann et al. for aggregate occupation in agriculture, forestry and fishery.³⁷

[Insert Figure 3 about here]

Figure 3 demonstrates that the number of persons working in agriculture decreased until 1933 but remained nearly constant afterwards. Admittedly, the number of working hours would be a more appropriate measure for labour input in agriculture. We do, however, not have adequate data on working hours. If this introduces a bias in our series this is to be suspected in the second half of the 1930s, as there is anecdotal evidence that the daily working hours increased in the course of the battle for production and afterwards, especially for the farm women.³⁸

³⁴ For more details, see Jochen Streb and Wolfram Pyta (2005), Von der Bodenproduktivität zur Arbeitsproduktivität: Der agrarökonomische Paradigmenwechsel im "Dritten Reich", *Zeitschrift für Agrargeschichte und Agrarsoziologie*, 53, pp. 56-78.

³⁵ For more details, see Hoffmann et al. (1965), pp. 265-294, 309-311.

³⁶ Cf. Hoffmann et al. (1965), pp. 228-238.

³⁷ Cf. Hoffmann et al. (1965), pp. 190, 205f.

³⁸ See on rough estimates of the working time of women: Clifford R. Lovin (1986), Farm Women in the Third Reich, *Agricultural History*, 60, no. 3, pp. 105-123, here pp. 115-117.

In addition to the factor inputs we need data for the production elasticities a , β and γ which correspond to the average wage, land and capital rents, respectively. As they add up to unity, it is sufficient to estimate the wage rent and the land rent. For the interwar years, the quality of the data does not allow a satisfactory estimate.³⁹ For the 1950s, however, the data are sufficiently adequate⁴⁰ to suggest a split of 70:15:15 which we assume for all three periods under consideration. It should be noted that the results are very robust in respect to other partitions.⁴¹ Hence we calculate total factor productivity according to equation (3).

$$(3) w_P = w_O - 0.7 \cdot w_L - 0.15 \cdot w_T - 0.15 \cdot w_C$$

Table 1 summarizes the results of our analysis.

[Insert Table 1 about here]

As we have already seen the national socialist agricultural policy was not able to maintain the output growth rate realized in the Weimar Republic. While average annual agricultural output rose by 3.23 per cent between 1925 and 1932, this decelerated to a mere 2.12 per cent between 1933 and 1938. This was particularly disappointing in view of the development of the factor inputs. In respect to the quantitatively most important factor, labour, the regime had at least been able to slow down the outflow of labour from the rural areas into the cities. The annual labour input decrease was reduced from 0.96 per cent to a mere 0.20 per cent. The growth rate of capital input was even slightly increased. Only the results for land input were worse in the period 1933 to 1938 than in the period 1925 to 1932.

The main cause for the modest growth of agriculture in the Nazi period was the low increase in total factor productivity. The average annual total factor productivity growth rate of 2.14 per cent between 1933 and 1938 was just 58 per cent compared to that of the preceding Weimar period and 52 per cent to that of the Federal Republic. We conclude that this slow-down in productivity growth was mainly caused by the much propagated institutional innovations of the *Reichsnährstand* and the *Reichserbhofgesetz* which obviously constrained individual farmers' possibilities to make use of agricultural progress in comparison to their larger scope of action in the Weimar Republic and the Federal Republic.

³⁹ See the discussion in Degler and Streb (2006).

⁴⁰ Cf. Hoffmann et al. (1965), pp. 491, 494f.; Franz Brandkamp (1965), *Struktur und Preisniveau des landwirtschaftlichen Pachtwesens, Berichte über Landwirtschaft*, n.s. 43, pp. 55-82; Horst Feuerstein (1971), *Bodenpreis und Bodenmarkt: Bestimmungsgründe der Preise und des Transfers land- und forstwirtschaftlich genutzten Bodens. Eine ökonomische Analyse des schleswig-holsteinischen Bodenmarktes von 1954 bis 1968*, Hanover: Strothe; Mechthild Kütke (1961), *Untersuchung der betriebswirtschaftlichen Situation in Zupachtbetrieben und ihre Entwicklungsmöglichkeiten im Hinblick auf eine gesunde Agrarstruktur*, Ph.D. diss. Giessen.

⁴¹ Splits which assign to labour a production elasticity which is higher than 0.7 lead to even smaller relative total factor productivity growth in the Third Reich.

Moreover, in contrast to the explicit goals of the national socialist agrarian planners they were also not able to increase the growth of land productivity.⁴² Finally, it is revealing for the character of the Nazi agricultural policy that it delayed the modernization of German agriculture. First, the growth of capital intensity slowed down in the 1930s. As a result, one can interpret the high growth of capital intensity in the 1950s at least in parts as a retarded catch-up process. Second, also in contrast to the long-term trend, the average annual growth rate of land intensity was negative in the years between 1933 and 1938. This development resulted in a lower land endowment per person working in agriculture which reduced his or her labour productivity. As labour productivity in manufacturing rose at the same time, the gap between agricultural and manufacturing wages increased and thus encouraged the rural exodus which was so strongly criticized by Nazi politicians.

The deceleration of the growth of both capital intensity and total factor productivity fully confirm the hypothesis of Corni that the modernization process of agriculture was slowed down in the Third Reich. The "battle for production" was clearly lost, and this had consequences for German consumers.

4. The Effects of Nazi Agricultural and Consumption Policies on Food Consumption

To what extent did the inability to modernize and increase agricultural production, the unwillingness to import foodstuffs, the imposition of supply constraints and political prices affect private food consumption? It should be emphasized that in German households of the interwar period food expenses still dominated all other expenditure issues.

[Insert Table 2 about here]

In general, we suppose that, when real GDP per capita is increasing, households substitute high-valued foodstuffs with relatively high income elasticity for basic food stuffs with relatively low income elasticity. Any analysis of consumption after 1933, however, is confronted with the problem that it was distorted by the government measures discussed in section 2. The multitude of constraints imposed on the household's consumption behaviour must have led to numerous involuntary substitution effects. The problem is how to assess changes in the consumption bundle in a world in which price signals do no longer convey valid information on how much households value the goods they consume?

⁴² Cf. Streb and Pyta (2005), pp. 69-78.

To solve this problem we make use of a straightforward benchmark that gives us an idea about how consumption would have roughly developed in the absence of Nazi market regulation: Assuming both that the preferences of the German consumers were stable in the mid of the 20th century and that preferences in West Germany were not substantially different from those of the whole of Germany, the consumption pattern of Germany in the 1950s should mirror the hypothetical consumption of the 1930s.

In Table 3 we compare the average per capita food consumption of the calendar years 1927-28 (=100) with that of 1937-38 and the average of the harvest years 1950-51 and 1951-52. In the late 1930s and the early 1950s, per capita GDP was nearly identical.⁴³ The difference is that demand and supply of foodstuffs were subjected to substantial regulation in the 1930s, but much less in the early 1950s. In 1951, when real GDP per capita was 20 percent higher than in 1927-28, German households substituted wheat flour for rye flour and potatoes, and fresh and tropical fruits for vegetables. They also substituted margarine for butter which reflects a preference for a cheap spread fat (the role of cholesterol was not yet known). Under the assumption of stable preferences, it is reasonable to expect that German households would have consumed a similar bundle of foodstuffs in the boom years of the Third Reich when real GDP per capita was as high as in 1951. Table 3, however, demonstrates that the consumption pattern in 1937-38 considerably differed from the one in the Federal Republic. Per capita consumption of typical inferior goods like rye flour and potatoes was higher, while per capita consumption of wheat flour products, fresh fruits, tropical fruits, sugar, margarine, full cream milk, vegetables and total fat was lower than after the Second World War.

[Insert Table 3 about here]

The demand patterns for certain products need a little more explanation. As the German margarine industry relied on imported primary products, the Nazi government severely constrained margarine production and subsidized butter production. In addition, margarine producers were forced to substitute skimmed milk for vegetable oils.⁴⁴ As margarine production

⁴³ In constant prices—which is not unproblematic as the cost of living index was of course influenced by the Nazi price policies. By comparing prices from household surveys that were actually paid with the official prices, however, Steiner has argued that the price differences were negligible in the food sector; cf. André Steiner (2005), *Zur Neuschätzung des Lebenshaltungskostenindex für die Vorkriegszeit des Nationalsozialismus*, *Jahrbuch für Wirtschaftsgeschichte*, no. 2, pp. 129-152. For a critique of the official consumer price index, cf. Mark Spoerer and Jochen Streb (2006), *The Economic Impact of the Nazi Armament Policy on the Welfare of the German Consumers* (Paper prepared for the XIV International Economic History Congress, Helsinki, Session 103: New Experiences with Historical National Accounts: Methodologies and Analysis).

⁴⁴ Cf. Pelzer and Reith (2001), pp. 76f.

was decreasing consumers were forced to buy the dearer butter. Another income-elastic product which the Nazis was consumed in larger quantities in 1937-38 than in 1927-28 and 1951 is meat.⁴⁵

Yet, apart from these cases it is clear that rye bread and potatoes were a much more frugal diet than white bread, vegetables and fruits. Obviously, as a result of the regulation of the agricultural production, of the food processing industry and of foreign trade, German households were forced to spend their income mainly on foodstuffs they preferred less. If, however, the German consumers were forced to substitute rye products for wheat products, were they compensated by more meat and butter, and even better off in the end? An obvious further step of our analysis is to weight these countervailing effects.

From a large consumer survey carried through by the German statistical office we know the average quantities of the most important foodstuffs consumed by a typical worker household in 1927-28. As the statistical office also recorded the average prices, we are able to calculate the value of the food consumption bundle in 1927-28, which is 950 RM per year. After the trough of the economic crisis in the early 1930s, real GDP per capita attained the level of 1927-28 again in 1935-36. If we value the food consumption bundle of 1935-36 in prices of 1927-28, we derive 948 RM. What is interesting here is not so much that the 1935-36 food consumption bundle was slightly below the budget constraint of 1927-28 but that the household could have bought the new bundle already in 1927-28 yet obviously preferred another one: white bread rather than rye bread, beef rather than pork, fruits and vegetables rather than potatoes.⁴⁶

[Insert Table 4 about here]

If we repeat the same procedure for the food consumption bundle of 1937-38, we derive a value of 981 RM in prices of 1927-28. The question whether or not the households preferred this slightly dearer consumption bundle of 1937-38 to the bundle of 1927-28 cannot be answered with the help of the theory of revealed preferences. Figure 4 illustrates that both cases are possible. Note, however, that the fact, that the bundle of 1937-38 valued by prices of 1927-28 was 3 percent more expensive than the bundle of 1927-28 does not automatically imply that the former was preferred to the latter. Figure 4 illustrates this for a simplified world of just two commodities.

[Insert Figure 4 about here]

⁴⁵ See for the consumption of meat in a long-term perspective Hans-Jürgen Teuteberg (1998), *Der Fleisch- und Wurstverzehr der Deutschen in historischer Betrachtung, Ernährungsforschung*, pp. 1-28.

⁴⁶ One is tempted to add: and more beer. However, there seems to have been a trend of declining beer consumption (see the results for 1951 in Table 3). We did not yet find a satisfactory explanation for this surprising trend. Wine consumption in the 1950s was certainly not much larger than in the interwar period.

A possible objection that we cannot test here is that the regime might have compensated consumers for their frugal diet with non-food products such as cloths or better housing. However, the complaints about the deteriorating quality of cloths were ubiquitous, and quality deterioration was also a problem in residential construction.⁴⁷ At the eve of World War II, the diet and the non-food consumption of German consumers was at most at the pre-crisis level of the late 1920s. Although American-style mass consumption was on the agenda of the regime,⁴⁸ it failed to considerably improve the standard of living, partly deliberately, because it prioritized armaments production, partly unintentionally, because the ideologically motivated institutional changes in agriculture proved to be counterproductive.

5. Concluding Remarks

The evidence presented here supports the more pessimistic view of the standard of living under Nazi rule. In passing we note that the antithesis of "butter" vs. "guns" that has occupied the literature on the Nazi economic systems since at least the 1940s does not make much sense. "Butter" is not a suitable metaphor for the consumer demand of the 1930s as it was more of a 'recommended' product in the sense of Figure 1b than a 'rationed' product. Butter was a product that many households would have liked to replace with margarine, which they preferred, and thus is much more a metaphor for consumption enforced by the regime. The challenge was to supply more margarine, not more butter.

A more important issue is still the question of approval of the regime. If, as we hope to have shown, the material standard of living was very modest and if, as Baten and Wagner argue, the biological standard of living fell behind that of Western Europe, why did most Germans approve the regime? Recent economic research on happiness and satisfaction does not really help. As Bruno Frey and Alois Stutzer point out, important variables that are conducive for happiness, apart from material affluence, are political, economic and personal freedom, direct political participation and decentralization,⁴⁹ issues not very prominent among Nazi politicians.

And probably not among the German people. It has always been debated among economic historians whether the peak of the 1920s upturn or the traumatic experience of 1931-32 was the reference period for the contemporaries. As Hartmut Berghoff recently has argued, 1932 served as reference period not only for the Nazi propaganda, but for most German households as well. According to Berghoff, another factor contributed to the approval of the regime, even among

⁴⁷ Cf. Berghoff (2001), pp. 175, 180f.

⁴⁸ Cf. Berghoff (2001).

⁴⁹ Bruno Frey and Alois Stutzer (2002), What Can Economists Learn from Happiness Research?, *Journal of Economic Literature*, 40, pp. 402-435; idem (2005), Happiness Research: State and Prospects, *Review of Social Economy*, 63, pp. 207-228.

working class people. The Nazi propaganda was quite successful in delivering 'virtual consumption' which served as a substitute for real (and restrained) consumption.

In our understanding, 'virtual consumption' might be interpreted in two ways. On the one hand, the notion suggests that the Nazis were successful in having consumers defer (real) consumption to a future date, e.g. if they participated in the *Volkswagen* savings program which started in August 1938. At least the more affluent strata of the German society may have dreamt that these consumption promises would materialize in the future and were in the position to increase their propensity to save. This might be a reason (among others) why the savings-income ratio, which was remarkably low throughout the mid-1930s, increased in 1938.⁵⁰ For the lower class households, probably even for the median household, the *Volks*-products were illusionary.⁵¹ Their budget was spent for food, rent and clothing and thus for product groups in which the national socialist regime had a remarkably modest record.

On the other hand, 'virtual consumption' may stand for an increase in the consumption of public goods which seemingly compensated many households for the mediocre consumption possibilities of private goods. To the list of non-economic variables that Frey and Stutzer find important for individual happiness one could add, at least for Germany in the 1930s, public goods like national pride, economic and (for unpolitical and 'aryan' citizens) political stability. In particular, economic stability may have played a very important role after the shocking experiences of the hyperinflation 1923 and the great slump in 1931 and 1932. German households were possibly willing to trade utility from material consumption for lower economic risks.

⁵⁰ See fn. 19 below.

⁵¹ Cf. Wolfgang König (2004), *Volkswagen, Volksempfänger, Volksgemeinschaft: "Volksprodukte" im Dritten Reich: Vom Scheitern einer nationalsozialistischen Konsumgesellschaft*, Paderborn: Schöningh, pp. 258-262.

Data Appendix

Consumption: *Vierteljahrshefte zur Statistik des Deutschen Reichs* (1937), pp. 1.47-60; *Statistisches Jahrbuch für das Deutsche Reich* (1935), p. 335, (1936), pp. 350f., (1939/40), pp. 398-401, (1941/42), pp. 436-439; *Statistisches Handbuch von Deutschland 1928-1944* (1949). Ed. by Länderrat des Amerikanischen Besatzungsgebiets, Munich: Ehrenwirth, pp. 488f.; *Statistisches Jahrbuch für die Bundesrepublik Deutschland* (1953), p. 461; Grupe (1957), pp. 11.88f.

Disposable income: Sources and methods described in Spoerer (2005).

Prices: *Vierteljahrshefte zur Statistik des Deutschen Reichs* (1938), p. 11.140, *Statistisches Handbuch für Deutschland* (1949), p. 467.

Table 1 Net Value Added, Factor Input and Productivity in Comparison (in per cent)

	Weimar Republic 1925-1932	Third Reich 1933-1939	Federal Republic 1950-1959
Average annual growth rate in per cent			
Net Value Added	3.23	2.12	2.16
Labour input	-0.96	-0.20	-3.12
Land input	0.43	-0.48	0.13
Capital input	1.23	1.30	1.74
Labour intensity (T/L)	1.39	-0.28	3.24
Capital intensity (K/L)	2.19	1.50	4.85
Labour productivity	4.20	2.30	5.30
Land productivity	2.86	2.61	2.03
Capital productivity	1.99	0.90	0.43
Total factor productivity	3.68	2.14	4.08

Table 2 Expenditure Shares of Various Household Types, 1927-28

Household type, annual income	Food	Habitation	Clothing	Other
Blue collar				
< 2,500 RM	48	19	10	23
> 4,300 RM	42	17	5	36
White collar				
< 3,000 RM	42	22	11	25
> 6,100 RM	28	21	13	38
Civil servants				
< 3,000 RM	43	22	12	23
> 10,000 RM	22	24	12	42

Source: Statistisches Reichsamt (1932), *Die Lebenshaltung von 2000 Arbeiter-, Angestellten und Beamtenhaushaltungen. Erhebungen von Wirtschaftsrechnungen im Deutschen Reich von 1927/28*, vol. 1, Berlin: Hobbing, pp. 20, 32, 43.

Table 3 Real GDP per Capita and per Capita Food Consumption in Germany, 1927-28=100

Year	Third Reich Ø 1937-38 (i)	Federal Republic Ø1951 (ii)	(i) in per cent of (ii) (iii)
<i>Real GDP per capita</i>	117	120	98
Skimmed milk	308	195	158
Fresh fruits	98	145	68
Margarine	85	139	62
Tropical fruits	77	128	61
Sugar	104	114	91
Wheat flour products	90	108	84
Eggs	111	103	108
Potatoes	102	99	103
Total fat	96	97	99
Full-cream milk	92	97	95
Vegetables	93	93	99
Beef	107	77	138
Butter	122	76	161
Total meat	106	73	145
Pork	104	72	144
Rye flour products	108	65	165
Beer	79	48	165

Notes: 1927-28: Germany without Saarland; 1937-38: Germany with Saarland and without Austria; 1951: Federal Republic of Germany with Berlin (West) and without Saarland.

Sources: consumption Dieter Grupe (1957), *Die Nahrungsmittelversorgung Deutschlands seit 1925. Eine Auswertung der einschlägigen Statistiken zu vergleichbaren Versorgungsbilanzen*, Hanover: Strothe, pp. II.88f.; beer *Statistisches Jahrbuch für das Deutsche Reich* (1935), p. 335, (1936), p. 350; *Statistisches Handbuch von Deutschland 1928-1944* (1949), p. 489; *Statistisches Jahrbuch für die Bundesrepublik Deutschland* (1953), p. 461. GDP Albrecht Ritschl and Mark Spoerer (1997), *Das Bruttosozialprodukt in Deutschland nach den amtlichen Volkseinkommens- und Sozialproduktsstatistiken 1901-1995, Jahrbuch für Wirtschaftsgeschichte*, no. 2, pp. 27-54, here pp. 51, 53.

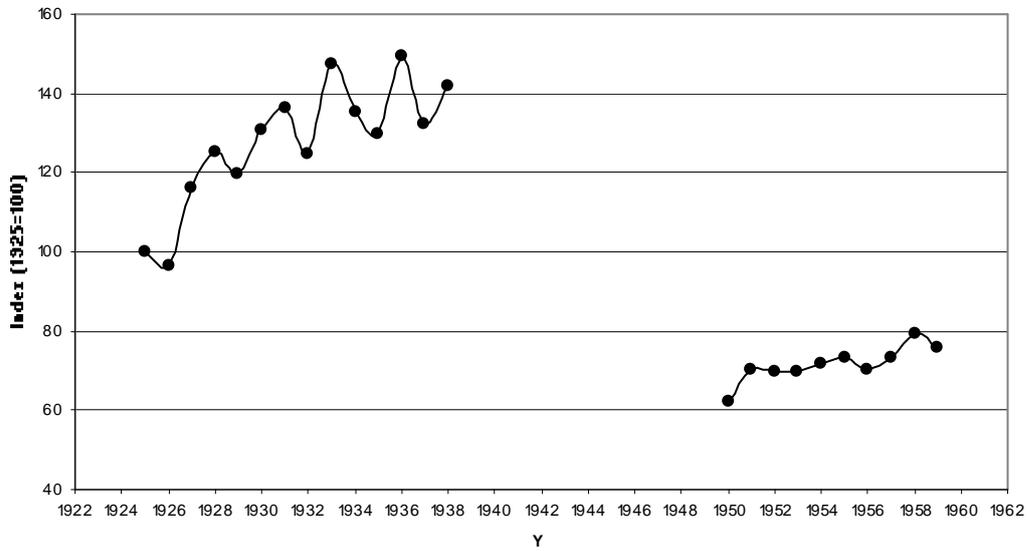
Table 4 Real GDP per Capita and per Capita Food Consumption in Germany, 1935-36 vs. 1927-28 change in per cent)

Year	Ø 1935-36
<i>Real GDP per capita</i>	± 0
Skimmed milk	+168
Butter	+13
Rye flour products	+5
Pork	+3
Potatoes	+1
Total meat	± 0
Eggs	± 0
Vegetables	-1
Total fat	-5
Sugar	-5
Full-cream milk	-8
Fresh fruits	-8
Margarine	-8
Tropical fruits	-9
Wheat flour products	-9
Beef	-9
Beer	-30

Notes: 1927-28: Germany without Saarland; 1937-38: Germany with Saarland and without Austria.

Sources: see Table 3.

Figure 2 Net Value Added in German Agriculture, 1925-1938 and 1950-1959 (1925=100)



Source: Walther G. Hoffmann et al. (1965), *Das Wachstum der deutschen Wirtschaft seit der Mitte des 19. Jahrhunderts*, Berlin et al.: Springer, pp. 318f.

Figure 3 The Material Production Factors of German Agriculture, 1925-1938, 1950-1959, (1925=100)



Sources: *Statistisches Jahrbuch für das Deutsche Reich*, *Statistisches Jahrbuch für die Bundesrepublik Deutschland*; various years; (1961), Hoffmann et al.(1965), pp. 205f., 228-238.

Figure 4: The food consumption bundles of 1927-28, 1935-36 and 1937-38 valued by prices of 1927-28

