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**Economic Transition in Central and East Europe,
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AGRICULTURAL TRANSFORMATION IN THE NEW FEDERAL STATES OF GERMANY*

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Agricultural Transition in the New Federal States of Germany

The economic transition of eastern Germany has proven harder than expected. While some discount for election rhetoric must be allowed, the promises of a blooming economy for the middle 1990s obtained without increased tax burdens on western Germans was unrealized. It is now clear that the economic transformation of eastern Germany will require many years and continued large transfers from western Germany.

This paper examines the forces unleashed by the economic transformation of eastern Germany and how these forces affected the agricultural sector. Most research on the agricultural transformation has been confined to agricultural forces. While that research yields many insights, what happened to agriculture in eastern Germany cannot be separated from the general transformation of the economy. This paper emphasizes the role of the broader forces unleashed by the introduction of market forces on the agricultural adjustment in the panorama of the total adjustment of the economy.

The paper begins with an overview of agriculture in eastern Germany during and at the end of the Socialist period. Numerous other authors cover this information in detail so a recapitulation of those efforts is unnecessary. The next section examines the policies and instruments used to introduce market forces. This qualitative information is blended with economic theory to obtain several hypotheses about how the transformation should have unfolded. Thereafter, statistical data is used to evaluate the expectations.

East German Agriculture in 1989

Agriculture in eastern Germany was ill equipped for competition with western agriculture. Enterprises were oversized, used worn-out capital, and carried excess labor (Langbehn, 1990, pp. 2-5 ; Kloos, 1990, pp. 8-9; Schmitt, 1990, pp. 7-10). These enterprises performed many functions associated with western municipal governments as well as providing services associated with both agribusiness and non-agribusiness firms. Estimates are that around 22 percent of collective farm labor was engaged in secondary activities (Großkopf and Kappelmann, 1991, p. 1). Productivity in labor, land, and capital was well below the levels in western Germany (Kloos, 1991, pp. 6-13; Nause, 1992, pp. 191-192).

Agriculture was not unique with these problems, rather these conditions were mirrored throughout the economy (Ehret and Patzig, 1991, pp. 121-123; Härtel, 1991, p. 8; Jahresgutachten 1990/91, pp. 62-66, 282-283; Kalmbach, 1991, pp. 11-14; Wirtschaftswoche, 1990, p. 22). Indeed, some authors argued that the agricultural sector was in a favorable situation relative to other sectors. Though the capital stock

was aged and worn-out, much was still useable and new investment could be delayed while enterprises coped with the short-run need to raise productivity (Schrader, Die Weltwirtschaft, 1990, p. 136). Combining crop and livestock production while releasing supervisory personnel and disposing of non-agricultural functions could quickly raise labor productivity (Dicke, 1990, p. 144). Other advantages for the agricultural sector were that prices would only need to fall to the levels set by the Common Agricultural Policy (Schrader, Die Weltwirtschaft, 1990, p. 136), that enterprises had scale advantages, and they could rapidly adopt western biological technology (Dicke, 1990, pp. 139-142). Thus, agriculture was seen as having the potential for relatively quick productivity increases and could overcome physical capital bottlenecks faster than many other sectors (Dicke, 1990, p. 141).

This situation reflected the long-run policy objectives and the manner in which they were pursued. While pure autarky was infeasible, trade, both internationally and inter-regionally, was discouraged (Kalatz and Schindler, 1992, p. 179-181; Teller, 1990, pp. 144-146). Agriculture was expected to cover the basic food needs of the country, particularly supplies of livestock products. During the 1970s when the poor performance of the feed supply sector caused conflict between autarky and securing food supplies, East Germany borrowed in international markets to import feedstuffs. In the 1980s, this decision added the objective of servicing its international debt. Imports were reduced, exports dumped in world markets, and investment curtailed to service the obligations (Hein, Hoepfner, and Stapel, 1992, pp. 30-31; Kalatz and Schindler, 1992, pp. 179-180; Nause, 1992, p. 191).

At a broad level, the policy instruments were common with other centrally planned economies. A state planning body set quantity targets for outputs and inputs which offered individual enterprises limited decision making freedom (Kurjo, 1990, p. 19). Prices were for accounting purposes and not for signaling relative scarcities of goods. Prices for producers were set artificially high. For agricultural goods, the pro-livestock policy was reflected in a distortion of livestock product to feedstuff prices - to the advantage of livestock (Kloos, 1990, pp. 8-9; Kurjo, 1990, p. 19; Nause, 1992, p. 197). Consumer prices for basic goods were subsidized while prices for luxury items were set high (Kurjo, 1990, p. 22; Saretzki, Schenke, and Glende, 1992, pp. 146-9). Thus, the state tried to offset losses incurred on basic goods via excessive prices on luxury goods (Pötzsch, 1992, p. 115).

Investment and tax policy were used to steer the economy as set by the plan. Enterprises making profits were heavily taxed to provide subsidies to unprofitable enterprises and a pool of funds for investment in sectors and facilities determined by central authorities. Among the sectors, no sector, except for heavy industry, received more investment than agriculture (Nause, 1992, p. 192). In 1955, agriculture received 14.5 percent of the investment and that share remained generally constant until 1972. By the 1980s, agriculture's share of investment had declined to 8 percent (Statistisches Jahrbuch der Deutschen Demokratischen Republik, various issues). Within sectors, investment was focused on large facilities to capture supposed scale economies without regard to whether the investment could be justified by its return. As a result, agricultural enterprises were of excessive and uneconomic sizes (Schmitt, 1990, pp. 7-10).

Another feature of the Socialist agricultural sector was the full specialization of enterprises. Specialization created interdependence and, for the system to function, the various units had to operate together. Each enterprise was dependent on others,

both upstream and downstream, and if a unit failed in its task, the other enterprises were in jeopardy.

Central planning created distortions on the demand side which affected food consumption. After 1960, official food prices were stable while producer prices were rising. This meant increasing subsidies so that by 1989, of every 100 marks paid for food, 84 marks were paid as a state subsidy (Münnich and König, 1992, p. 106). One hypothesis is that the stable price structure meant that income change was the major force influencing demand (Vankai, 1975, p. 5 and 9). Another interpretation is that unrealized spending opportunities for non-food goods and personal investment artificially stimulated food consumption (Münnich and König, 1992, p. 105; Tangermann, 1990, p. 15; Ulbricht, 1991, p. 135). Furthermore, the stable official prices could be viewed as an illusion due to implicit rationing which raised shadow prices for certain items and distorted consumption (Grings, 1991, p. 192). Sometimes goods disappeared and returned later in a different form, size, or in special shops for luxury goods (Pötzsch, 1992, pp. 117-118). This pricing structure artificially promoted food consumption in total and, within food consumption, patterns were distorted towards basic goods, usually of mediocre quality and variety.

The performance of the East German economy over the period was lackluster. While it out-performed most of its sister Socialist economies, its performance lagged behind those of Western economies. In the first two decades following the Second World War, considerable progress was made, but after the middle 1970s continued development required increasing resources. By the 1980s stagnation arrived and that was maintained at great financial and resource costs.

Whereas before the Second World War agriculture in this region had performed equal to or above the agriculture of western regions, by the 1980s the situation was reversed (Scholz, 21/90, p. 3). Some crops experienced considerable yield growth, but not as much as occurred in the west. Potatoes, sugar beets, and rapeseed saw little or no growth. Overall area was falling and many individual crops experienced large declines in area. Productivity growth also lagged in livestock production. Although livestock self-sufficiency was met, the cost of doing so was large imports of feedstuffs.

Forces Affecting Agriculture during Transition

Several forces affected the transformation of the economy as a whole, including agriculture. One critical force was the system of economic rights and institutions established by the treaty of economic and monetary union and the transfer of the West German political and social structure. Several factors motivated the design and timing of these treaties. There was the hope that the introduction of the Deutsche Mark would slow the exodus of labor from eastern Germany (Collier and Siebert, 1991, p. 199). The defective economic system was an obstacle to investment (Jahresgutachten 1990/91, p. 65). The treaties also reflected the drive for social union (Härtel, 1991, p. 7).

The timing of the union was contentious. Shock therapy would contribute to a quick rationalization of economic relationships and a quick success (Scharrer, 1990, p. 77). This would cause a rapid, severe adjustment that could be mitigated by a longer adjustment period (Jahresgutachten 1990/91, p. 307). Delay would allow competitive devaluations of the East German mark, which, coupled with wage restraint, would

help the competitiveness of East German enterprises. Nevertheless, unification occurred quickly due to political concerns over the influx of labor into West Germany (Spahn, 1991, p. 77).

An issue was the rate at which East German marks were to be exchanged for West German marks. The East German mark traded at a substantial discount (Thanner, 1989, p. 3). The Bundesbank argued for a 2:1 conversion to create a wage differential (Tietmeyer, 1991, p. 5) while politicians concerned over labor emigration argued for a 1:1 conversion (Härtel, 1991, p. 7). The general arrangement was for a 2:1 conversion with some exceptions. Individuals could obtain a 1:1 rate with limits. Most other money was converted at 2:1, but, importantly, price and wage contracts, as well as pensions, received the 1:1 rate (Sinn and Sinn, 1991, p. 34).

This decision critically affected the transformation of the eastern German economy, including agriculture. Because the conversion rate was more favorable than the parallel market rate, it can be viewed as imposing an overvalued exchange rate on the eastern German economy. An overvalued exchange rate acts like an export tax or import subsidy and puts downward pressure on all prices while shifting relative prices toward non-traded goods (Paarlberg, 1994, pp. 117-118). Lower prices translate into reduced outputs, again with a smaller drop in non-traded goods. Factor prices are forced lower. Because eastern German wage rates were not flexible downwards, this adjustment was pushed onto the returns to other factors like capital. This was a disincentive to invest in eastern Germany. Furthermore, the currency conversion left substantial debt in the hands of East German enterprises and with the downward pressure on prices and outputs, enterprises would be squeezed. As a tradeable goods sector, agriculture was harmed by these pressures and collectives analyzed by Dabbert (1990) were not viable at a 1:1 conversions.

As noted above, the implicit overvaluation of the East German mark put downward pressure on factor prices, but wages were not flexible downwards. With an open border, the sustainability of wage differentials was contingent on the unwillingness of labor to relocate. Yet, the design of the economic union treaty was based on the pressures resulting from labor leaving the east. Another factor was that unemployment compensation was based on net wages and so labor tried to boost wages ahead of being released (Bellmann, 1991, p. 403). Fear of inflation following removal of food subsidies also limited the downward flexibility of wages (Geschäftsbericht der Deutschen Bundesbank für das Jahr 1990, p. 24). The institutional structure of the newly forming labor market played a role as eastern unions were better organized than employers and western unions had no desire for eastern Germany to become a low wage region (Sinn and Sinn, 1991, pp. 143-158).

The inability of wages to adjust forces other factor prices, notably rental rates on capital, to bear a larger adjustment (Paarlberg, 1994, p. 118). In the tradeable sectors rental rates fall and outputs contract with more labor-intensive goods showing more adjustment. With wages unable to adjust, the labor market clears by increasing unemployment and translates into larger transfer payments. Labor emigration is encouraged by additional unemployment, but the wage gap between the two regions of Germany is less. The impact on non-traded goods' prices and capital returns is ambiguous. Increased transfer payments reinforced by slower emigration and higher real wages support demand for non-traded goods. Yet some of the transfer payments are spent on tradable goods and unemployment payments are less than the lost income.

Another force affecting the general economic transformation, including agriculture, was the privatization of state-owned assets. The Treuhandanstalt, the agency created for this privatization, was given several conflicting goals (Lückemeyer, 1991, pp. 2-3). The agency was to administer state-owned assets and to privatize these as quickly and as extensively as possible while trying to rationalize firms and assuring their competitiveness. The Treuhand was expected to contribute to structural change (Waigel, 1991, p. 11). Income earned from sales of assets that could not be returned to former owners was to be used for compensation on expropriated property (Frankfurter Allgemeine Zeitung, May 2, 1991, p. 1).

Two types of agricultural land and capital fell under Treuhand administration. The first type comprised the land and non-land assets of state farms, much of which came from farms expropriated during the 1945-1949 land reform and not eligible for restitution. The second type was state-owned assets in the collective farms. Although collective farm members had ownership of a large share of the assets, over the decades the state had come to own a considerable portion of these assets as well. The exact size and location of these assets was not known, but roughly included 1.74 million hectares of agricultural land of which 1.4 million came from collective farms and 340,000 from state farms (Lückemeyer, 1991, p. 5).

The privatization of state-owned assets faced obstacles that handicapped the process. Locating the assets under the Treuhand administration was difficult as ownership records had been destroyed or were incomplete (DLG-Mitteilungen Agrar-Inform, 1991, pp. 67-68). Ownership claims against an asset limited the ability of the agency to privatize the asset (Ernährungsdienst, November 17, 1990, p. 2; DLG-Mitteilungen Agrar-Inform, 1991, p. 68). When this occurred, the Treuhand could offer annual leases, but these discouraged investment. Outstanding debt claims against assets also hindered privatization as responsibility for the debt had to be determined.

Agricultural land presented some unique problems. One was that land taken from 1945-1949 was not to be returned to owners, but former owners were to be compensated. The constitutionality of that arrangement was challenged early, but the challenge was rebuffed (Ehrenforth, 1991, p. 511). Nevertheless, the mechanics and sums for compensation were not resolved until September 1994 (Koester and Brooks, 1996, p. 14). Furthermore, with a large volume of land to privatize and a traditionally thin land market, privatization had the potential to depress land values throughout Germany. Thus, the Treuhand was allowed to use long-term leases to spread its land disposal over many years (Agra-Europe, 24/91, Länderberichte p. 28; Agra-Europe, 52/91, Länderberichte p. 9; Ernährungsdienst, May 16, 1991, p. 1).

The collective farms themselves and much of their land and inventory were not state-owned, and not the Treuhand's responsibility. The Agricultural Adjustment Law was the instrument to create a private, market-based agriculture from these enterprises (Agra-Europe, 29/90, Dokumentation). It, and its amended version, established rules for the valuation and division of assets among collective farm members and for the transformation of collective farms to forms recognized under West German law. Implementation of the law led to numerous disputes over valuation and distribution which hindered the transformation. These rules and disputes are described in the paper by Koester and Brooks (1996).

An important aspect of the Agricultural Adjustment Law was that, whereas the privatization of state-owned assets was to be spread out over years, the transformation of collective farms was to be quick. The law required either the legal transformation or liquidation of collective enterprises by January 1, 1992. Some states, notably Brandenburg, lobbied for a delay of the deadline (Agra-Europe, 48/91, Länderberichte pp. 2-3; Agra-Europe, 52/91, Sonderbeilage p. 1). No extension was granted and despite predictions that 500-800 collectives would be forcibly dissolved without a successor (Agra-Europe, 45/91, Länderberichte p. 54), the actual number was small -- 34 (Scholz, 1992, p. 163).

An aspect of the economic transformation of eastern Germany unique to agriculture was the extension of the European Community's Common Agricultural Policy (CAP). Economic union introduced the bulk of the CAP with some exclusions (Schrader, 1991, p. 19). Unlike other sectors, farm prices would not fall to world prices, but rather to the higher levels of the farm policy. Relative to East German producer prices, livestock products would experience a greater drop than feedstuff prices. Transition rules allowed some exceptions from CAP prices, altered rules for land set-aside, and for the introduction of production quotas.

Eastern German agriculture was disappointed with many of the rules. Whereas other countries entering the European Community had been given long adjustment periods, especially in sensitive areas like agriculture, there was little time for eastern German agriculture to accommodate itself to the new climate. The quotas in dairy and sugar were a target of criticism. The Community originally offered a sugar A-quota of 800,000 tons while the East German government wanted a quota of 900,000 tons (Pollack, 1990, p. 19). The actual sugar A-quota was 847,000 tons or 20 percent below previous output (Schrader, 1991, p. 20). The national milk quota after April 1, 1991 was 20 percent below the 1989 level (Schrader, 1991, p. 20). Because the individual states built a 10 percent reserve of quota rights, output cuts by individual producers were larger (Heiber, 1991, p. 68). The regional allocation of this quota was based on 1989 production and since transfer via sale or rent was not permitted, regions which felt they had a natural advantage in milk production were unhappy.

Under the assumption that the Common Agricultural Policy caused a relative price shift in favor of agriculture by limiting the fall in farm prices, the rental rate of capital is bid up relative to that in other sectors, although its nominal value will be lower (Paarlberg, 1994, p. 116). The fall in agricultural output is less severe. The impact on non-traded goods' prices is unclear, but the most likely outcome is that non-traded goods benefit. The standard substitution and income effects, as well as in inflows of transfer payments from the Community's budget, lend support to non-traded goods. Less unemployment due to the less severe drop in agricultural output lowers some transfer payments, but contributes to expenditure via earned income. Since the unemployment compensation is less than the income, the net effect is positive.

Competitive pressures during the transformation were expected to create considerable hardship on firms and labor. To dampen these effects, a number of transfer payment programs were introduced or existing programs expanded. Programs which transferred income to labor directly included unemployment compensation, retraining assistance, adjustment assistance, and early retirement incentives. Through the summer of 1992 firms received special money to retain labor even though that labor was not needed on a full-time basis (Frankfurter Allgemeine

Zeitung, December 13, 1991, p. 15). Additionally, firms received assistance to relieve liquidity bottlenecks based on calculated labor needs. In the case of farms, part of this assistance was to help finance input purchases while part was targeted to farms with plans for developing sustainable operations (Agra-Europe, 24/91, Länderberichte p. 56). The assistance rules favored farms which had already adjusted and smaller farms (Agra-Europe, 24/91, Länderberichte p. 56; Agra-Europe, 44/91, Kurzmeldungen p. 26).

The move to a competitive economy was to be facilitated by programs to restructure and modernize the economy (Frankfurter Allgemeine Zeitung, May 2, 1991, p. 18). These programs were divided into investment and general aid, residential aid, and aid to infrastructure development. Under such programs businesses qualified for reduced interest loans, credit guarantees, export credit guarantees, and accelerated depreciation. Public financing was to be limited in size and time with the intention of encouraging private commitments (Jahresgutachten 1990/91, p. 295).

For the agricultural sector, existing programs in western Germany were extended to the east. These included the village renewal and land consolidation programs as well as the agricultural credit program. In addition, two separate programs were created for farms in eastern Germany. One program was targeted to the newly reestablished private farms. A program similar to the Agricultural Credit Program was established to help restructuring collective farms.

An issue in establishing these programs was the division between social transfers and investment aids. Transfer payments would support demand during the transformation. For tradeable goods this would be reflected in a deteriorating trade balance for eastern Germany. For non-traded goods, the supported demand would put upward pressure on prices to encourage more output (Paarlberg, 1994, pp. 115-116). Large transfer payments were feared as a source of inflation (Jahresgutachten 1990/91, p. 306; Geschäftsbericht der Deutschen Bundesbank für das Jahr 1990, pp. 28-31). In contrast, the investment aids programs would increase the return to capital and encourage investment, which would raise output and income to create a self-sustaining path of economic growth. The danger was that the programs would not be administered neutrally with agencies controlling the aid decisions determining the structure of the emerging economy. Other concerns were that the aid was not transparent and that investment subsidies via reduced interest rates would encourage artificially capital-intensive investment with few jobs (Herz, 1993, p. 10).

Hypotheses about Economic Transformation

This discussion suggests several hypotheses about the transformation process which can be compared to what occurred. First, the implicit overvaluation, the labor market structure, the defective capital stock, and unresolved ownership issues suggest a decline in output as market forces are introduced. This decline should be associated with rising unemployment due to rigid wages combined with lower productivity and downward pressure on prices. To some extent, agricultural support under the CAP buffers the adjustment. During this contraction, non-traded goods should increase their share of economic output due to the influences of the overvaluation, agricultural policy, and transfers. Labor intensive, tradeable goods should show the most severe output declines.

While the discussion suggests a fall in agricultural output, the ability of eastern German agriculture to adopt the Common Agricultural Policy dampens the contraction. Some products: sugar beets, milk, and potatoes faced special rules and should show stronger declines. An additional aspect is that labor intensive commodities --livestock products and potatoes-- should reveal sharper declines.

Consumer demands should shift against food and basic goods as subsidies are withdrawn and as supplies of other goods became more abundant. Within food consumption, consumers should shift their emphasis toward quality, variety, and speciality products.

Expectations versus Reality

Having used qualitative information about the eastern Germany economy and the transformation rules as well as some basic economic theory to derive predictions about the transformation, it is necessary to examine data recording what actually occurred. The data concerning the actual adjustment to market forces will identify correct and incorrect expectations.

There are a number of limitations to the data to be mentioned. One limitation is that differences in reporting hinder the ability to compare 1989 under the East German regime with the transformation period. Consequently, interpretations of shifts recorded in the data must be broad. Another problem is that data during the first critical years of 1990 and 1991 are incomplete. Monitoring and recording systems were not yet functional and in any case too much was occurring too quickly. A third problem is that by the middle 1990s eastern and western German data were becoming merged and this hampers the identification of separate eastern German adjustments. Nevertheless, the data do shed light on the transformation process and its influence on agriculture.

Producer Price Changes

With the economic union, the expectation was that prices in eastern Germany would fall with producer prices for tradeable goods showing stronger decreases. The producer price changes for various goods relative to prices in 1989 are shown in Table 1. Most goods exhibited a quick drop with the bulk of the adjustment completed by the last half of 1990. After 1990, there was little subsequent change, with the exception of the electricity/gas sector where subsidies continued into 1992 and construction which experienced a sustained boom.

The data also suggest much different price changes across the sectors. Whereas electricity and gas producer prices in 1994 were nearly 41.7 percent above their 1989 level, agricultural prices had dropped 64.5 percent despite the support offered to some commodities by the Common Agricultural Policy. Manufacturing and investment goods also experienced sharp declines of roughly one-half and one-third, respectively. Producer prices for food products fell less --around 30 percent-- so that there was a relative price shift in favor of food processors.

Within agriculture there were relative price changes. East Germany had distorted producer prices to favor livestock as part of its pro-livestock policy (Böse, 1990, p. 3). By 1991, crop prices had fallen 50.9 percent and prices for slaughter animals had fallen 72.8 percent. Whereas by the middle of 1991 grain prices had stabilized 5

percent below those in western Germany, prices for meat and milk averaged 10 percent below western levels with large regional differences (Isermeyer, 1991, p. 295). This is reflected in the continuing decline in slaughter livestock and milk prices after 1991 (Table 1).

Another factor in the agricultural sector was that input prices did not fall as quickly as output prices and put enterprises in a price-cost squeeze. The overall input-cost index in 1991 was 25.5 percent below the level of 1989, but then rose. By 1994, agricultural input costs were 12.3 percent lower while the index for farm goods was 64.5 percent lower. Chemicals and feed showed large price declines while fuel costs were roughly the same. Repair and building costs exhibited large increases which reflected their labor intensity.

The degree to which the implicit overvaluation, the labor market policy, the transfers, and farm policy contributed to the adjustments can be estimated using a simple general equilibrium model of eastern Germany (Paarlberg, 1994, pp. 118-120). Whereas a 1 percent implicit currency overvaluation translates into a 1 percent fall in tradeable goods' prices, prices of non-traded goods fall 0.68 percent. A 1 percent wage increase cannot affect traded goods' prices because they are tied down by western German prices, but does result in a 0.32 percent increase in prices of non-traded goods. In the case of transfers from western Germany the same pattern appears, but the increase in non-trade goods' prices is larger -- 0.96 percent. Farm price support does not affect the prices of traded non-agricultural goods as they are linked to western German prices, but does affect prices of non-traded goods. For each 1 percent increase in prices of agricultural goods due to the price support policy, prices for non-traded goods are 0.4 percent higher.

Output Adjustments

Another hypothesis was that the implicit overvaluation of the currency and the labor market policy would lower economic activity in general. These forces, plus the large transfer payments --140-180 billion marks per year-- and farm price supports, would shift the mix of output in favor of non-traded goods. The general equilibrium model results show that a 1 percent wage increase or a 1 percent currency overvaluation have the strongest adverse effects on agricultural output (-0.56 percent) and the least impact on the output of non-agricultural traded goods (-0.26 percent). This pattern is obtained because agriculture is a traded good and, reflecting the situation in 1990, is modeled as labor intensive related to other traded goods. Although non-traded goods are modeled as the most labor intensive, their output drop lies in between (-0.47 percent). A 1 percent increase in transfer payments only affects non-traded goods' outputs (+0.67 percent). A farm price support policy that raises agricultural prices 1 percent adds 0.56 percent to agricultural output and 0.28 percent to the output of non-traded goods.

Data on the Gross Domestic Product support these hypotheses. A severe drop occurred during 1990 and 1991. Thereafter, the economy began to grow quite well, although the recession of the middle 1990s slowed the expansion.

Data in Table 2 record the shift in the composition of the eastern German economy and support the arguments presented above. Sectors dominated by tradeable goods --agriculture and manufacturing-- shrank as a share of the Gross Domestic Product, while the shares of sectors with more non-traded goods rose. The share of the

economy contributed by agriculture fell from around 10 percent (probably overstated) to consistently under 2 percent after 1991. The manufacturing sector also showed a large drop to 1991 and then stabilized. The share of the economy devoted to distribution and transportation appears to have initially risen, but then fell after 1991. In contrast, the service and state sectors gained importance.

Another hypothesis was that the integration of the western and eastern German labor market with the consequent upward pressure on wages would shift the output pattern of the economy away from labor intensive goods. Indeed, rising labor costs in eastern Germany have been seen as a major handicap for that economy (see Piper, *Die Zeit*, 1996, p.11). The data in Tables 2 and 3 are not entirely consistent with that hypothesis. The sectors showing growth in Table 2 --services, state-- are relatively labor intensive. Within the declining manufacturing sector, using the second half of 1990 as a base, consumer goods are the most labor intensive --52.6 percent of the cost-- yet show less decline than mining and investment goods (Table 3). Basic producer goods, with a labor cost share of 28.6 percent, experienced roughly the same output decline as consumer goods. At the same time, two sectors with low labor cost shares, electricity/gas and food products, show little output decline after the second half of 1990.

One explanation of the inconsistency of these data with the hypothesized effects of upward wage pressure is that the hypothesized results ignore other factors, like demand shifts. The East German economy was deficient in services, construction, and consumer goods. Pent-up demands in these areas produced shifts which offset the increasing labor costs.

For agricultural outputs the hypothesized effects are that output contracts in total with labor intensive goods showing more adjustment. The output adjustments for major crops and livestock are presented in Tables 4 and 5. Output in crops (Table 4) was not as adversely affected as that for livestock (Table 5). The exception to this is the output of potatoes which, being labor intensive and used as feed in East Germany, fell the most --between 70 and 80 percent. Among the crops, rapeseed output rose sharply --around 300 percent-- and wheat output also exhibited a strong rise --60-80 percent. Sugar beet output has tended to be about the same as in 1989 because they were profitable under B-quota prices. The outputs of barley, oats, and, until 1995, rye fell. Meanwhile, livestock inventories fell sharply and, except for hens, have not recovered. Cattle numbers halved, swine and sheep numbers fell 70 to 75 percent.

These adjustments reflected a number of forces both internal and external to the sector. External forces included rising labor costs, which more strongly affected livestock, and the implicit overvaluation which put downward pressure on the prices of tradeable goods. Compared to livestock, crops had a more favorable starting position based on costs and returns (Böse and Welschhof, 1991, p. 1). The adjustment to western prices was less severe for crops and measures were quickly taken to ease the price pressure. These included intervention purchases, export subsidies, and a set-aside program (Fock and Kreitmair, 1991, p. 89). For crops, labor costs were less of a problem as labor could be replaced by machinery (Weinschenk, *et al.*, 1990, p. 4). While the machinery was old, it was still useful and replacement could be delayed. The size and concentration of livestock facilities on limited land raised feed expenses, caused manure disposal problems, and created health problems (Agra-Europe, 38/90. Dokumentation pp. 6-7). Large livestock

facilities were not as easily subdivided as were crop enterprises and this made privatization more difficult. The capital in livestock units was worn-out and labor intensive, yet could not be easily replaced. Milk quotas added to the difficulties of the livestock sector by inhibiting adjustment. Compounding the other problems for livestock producers was the collapse of demand for eastern German products in 1990 and 1991 (Böse, 1990, p. 3). Crops were less severely affected as they could be easily shipped west and were homogeneous products. Livestock products were harder to transport and the lack of quality and variety in eastern German livestock products was a problem for producers.

The role of the Common Agricultural Policy as a buffer is not easily seen in the adjustments shown in Tables 1, 4, and 5. Given an all-commodity Producer Subsidy Equivalent (PSE) of 49 percent for 1990 and 1991 (Economic Research Service, 1992, p. 108), the results from the general equilibrium model presented earlier suggest that agricultural output would have been some 27 percent less without the price support. Thus, while the output declines reported in Tables 4 and 5 are severe by themselves, they would have been larger without the support offered to major commodities by the Common Agricultural Policy.

Unemployment

Several hypotheses about unemployment were presented. One hypothesis was that the implicit currency overvaluation and the upward pressure on eastern German wages would worsen unemployment. In the general equilibrium model, each 1 percent overvaluation or wage increase increases the number of unemployed by 15 percent (Paarlberg, 1994, p. 120). Counter forces were the transfer payments and the adoption of the Common Agricultural Policy. A 1 percent increase in transfer payments reduces the number of unemployed by 7.5 percent, while for each 1 percent that farm prices exceed the undistorted market equilibrium level, the number of unemployed is reduced by 5 percent (Paarlberg, 1994, p. 120).

With excess labor on enterprises throughout the economy, unemployment appeared quickly and was partially disguised by official unemployment figures. Unemployment which was 38,000 persons at the end of the first quarter of 1990 reached over 1 million by the summer of 1991. Whereas official unemployment in September 1990 was 5 percent, adjusting for actual hours worked yielded an unemployment rate of 21 percent (Ehret and Patzig, 1991, p. 116). Unemployment remained high throughout the period, in part due to a recession throughout Germany. The December 1996 official unemployment rate for eastern Germany was 15.9 percent (Deutschland Nachrichten, January 17, 1997, p. 5).

While the Common Agricultural Policy buffered the agricultural labor market, the adjustment was still severe. By December 1990, of the 863,000 persons employed in the sector as of the fall of 1989, about 51,000 (6 percent) were unemployed and 282,000 were short-time labor with no effective work. Lösch (1991, p. 45) calculates an effective unemployment rate in agriculture of 39 percent. At the end of 1991 roughly 300,000 remained employed in agriculture (Agra-Europe, 29/91, Kurzmeldungen p. 19); Frankfurter Allgemeine Zeitung, January 20, 1992, p. 15). By 1995, earlier forecasts of under 100,000 persons employed in the sector (Frankfurter Allgemeine Zeitung, January 9, 1992, p. 11) were close to being realized as employment fell to under 200,000.

Within the decline in agricultural employment there was a shift in the male/female labor balance. In 1989, 61.5 percent of the agricultural labor was male. The female labor share in livestock and horticultural products was higher and as output of these commodities contracted more than that of grains, a disproportionate share of the adjustment fell on women. By April 1993, women comprised 63.2 percent of the unemployed. While a woman did not have a higher risk of losing her job, she was more likely to remain unemployed and had a more difficult time finding new unemployment (Fink, Grajewski, Siebert, and Zierold, 1994, pp. 312-31).

Adjustments in Consumption

Consumption adjustments were an important aspect of the transformation process that affected eastern German agriculture with the expectation that demand for food would fall. Reform meant the end of consumption subsidies, including those on food, and a rationalization of the distorted consumption patterns. There was also concern that reform would be accompanied by inflation.

Data for retail price changes and the cost of living are given in Table 6. These data show little serious inflation. From 1989 to February 1991, the aggregate cost of living rose 9.7 percent. From 1991 through 1995, the cost of living rose 32.7 percent. One reason for the absence of inflation was that the overhang in purchasing power was not as severe as in some transforming countries. Furthermore, pent-up demand was quickly satisfied by western imports. Of major importance was that eastern Germany adopted a currency controlled by a central bank determined to fight inflation. Finally, the implicit overvaluation of the currency put downward pressure on prices.

Under reform, relative prices shifted within categories of goods as well as among categories. The changes in the cost of living by good categories are given in Table 6. From 1989 through February 1991, the prices for clothing, transportation/information, and furniture fell. Prices in the remaining categories rose, with the rent category showing the smallest rise --2.5 percent-- as rents remained controlled. The cost of living for food/beverages/tobacco exhibited a 20.2 percent rise. All categories of goods experienced increases in their cost of living after 1991. The cost of living for rent more than tripled as rent controls began to be relaxed in 1992. Among the categories shown only furniture and clothing increased less than did food costs.

The changes in expenditure for a middle income household from 1989 to 1995 are depicted in Table 7. Expenditures devoted to food, to clothing, and furniture declined with those losses absorbed by a large increase in expenditure devoted to rent. The remaining categories experienced little change.

While the share of household income devoted to food fell, Tables 6 and 7 suggest that food consumption rose. From 1991 through 1995 expenditures on food increased 14 percent while prices rose 7 percent. This implies increased food consumption. In contrast, expenditure on rent rose 216 percent while the cost of living rose 326 percent. The data from Tables 6 and 7 also imply falling use of goods in the categories of health and transportation/information. Categories that appear to have increased use include clothing, furniture, education/leisure, and other.

One hypothesis is that with reform demand would shift away from food and toward other items not formerly available. The data in Tables 6 and 7 do not entirely support

that hypothesis. While the share of consumption expenditure devoted to food fell sharply, actual expenditures rose and the percentage rise in expenditures exceeded the rise in prices. Food demand appears to have risen in aggregate, although the rise was less than that experienced by some other commodity groups.

East German food consumption patterns differed from those in West Germany and the presumption was that reform would align the patterns of eastern Germany to those of the west. The quantities consumed by a middle income household in eastern and western Germany for selected foods from 1989 through 1995 are given in Table 8. In 1995, eastern German middle income households consumed more meat, butter, fats, bananas, potatoes, and bread than did western German middle income households. Meanwhile, the eastern German household consumed less fish, milk, cheese, eggs, sugar, wheat flour, and rice than did the western German household. While the individual numbers fluctuated, the changes relative to 1989 were reasonably stable. Meat consumption during the transition rose while fish and milk consumption fell. The difference in the quantities of butter consumed in eastern and western Germany narrowed as eastern German consumption fell sharply while eastern German use of margarine rose. Eastern German consumption of bread and sugar fell. By 1995, eastern German middle income households continued to consume more bread than did western households. But whereas in 1989 eastern Germans had consumed more sugar than western German middle income households, during the transition eastern German sugar consumption fell below the western level.

These data suggest that total food consumption did not fall during the transition, although some other items claimed an increased share of income. Also, while consumption of some foods did adjust toward western German levels, consumption of other foods did not, and through 1995 differences in food consumption patterns remained. Eastern German middle income households consumed more meat, fats, and starches than did western German middle income households.

Conclusions

This paper examines the transformation of agriculture in eastern Germany in the context of forces that have shaped the general transformation of the eastern German economy. Both forces internal to agriculture and forces external to agriculture are critical. Given institutional observations of the East German economy and economic theory, some hypotheses about the agricultural transformation and how agriculture was affected relative to other sectors can be formed. These hypotheses are examined with data recording the transformation.

One expectation was that economic transformation would put downward pressure on producer prices and economic activity as the currency was implicitly overvalued and wage rates were inflexible downwards. The data is consistent with this as producer prices for most sectors fell. Output for most sectors and Gross Domestic Product fell in the early 1990s and then began to rise.

A second hypothesis was that the mix of economic activity would shift against tradeable goods sectors, like agriculture. The observed impact of the transformation was that tradeable goods sectors, including agriculture, shrank as a share of the economy. Whereas agriculture accounted for around 10 percent of the East German economy, during the transformation its share fell to under 2 percent.

Another expectation was that labor intensive goods would exhibit more decline than other goods. The observed outcomes were only partially consistent with this expectation. In some cases, like electricity/gas and food products, sectors with low labor cost shares showed comparatively little decline. On the other hand, sectors like services and the state, which are labor intensive, grew due to pent-up demand.

In the agricultural sector, the expectation was that crops would be less adversely affected than livestock, and that among the crops, potatoes and sugar beets would be the most severely affected. The data support this hypothesis with the exception of sugar beets where output changed little. Also, it was hypothesized that the Common Agricultural Policy buffered the sector. Though output did not shrink for grains, rapeseed, and sugar beets, producer prices for crops fell 50-60 percent. Livestock numbers were down consistently over 50 percent and prices dropped 75 percent. Employment in the sector fell around 80 percent. A numerical general equilibrium model suggests these adjustments would have even more severe without the Common Agricultural Policy.

Hypotheses regarding food demand were that consumer demand would shift away from food and, among foods, the consumption patterns would evolve toward those of western Germany. The observed demand patterns do not seem to support these hypotheses. There did not appear to be a decline in the quantity of food consumed. Consumption of some foods did adjust toward western German levels, but other goods did not. Through 1995 there remained differences in eastern and western German food consumption patterns.

The transformation process has been difficult for eastern German agriculture, as it has been for other sectors. While there are several forces unique to agriculture, the problems of the sector --falling producer prices, reduced output, unemployment-- are not unique. Like other sectors, agriculture has been buffeted by general forces unleashed with the introduction of market forces into eastern Germany.

References

- Agra-Europe, "Landwirtschaftsanpassungsgesetz der DDR." 29/90. 19. Juli 1990. Dokumentation s. 1-14.
- Agra-Europe. "Erläuterungen zum Agrarkapitel im Entwurf des Einigungsvertrages." 38/90. 17. September 1990. Länderberichte s. 26-30.
- Agrar-Europe. "Landwirtschaftsanpassungsgesetz endgültig verabschiedet." 24/91. 10. Juni 1991. Länderberichte s. 49-52.
- Agra-Europe. "Nur jede fünfte Arbeitskraft bleibt in der ostdeutschen Landwirtschaft." 29/91. 15. Juli 1991. Kurzmeldungen s. 19.
- Agra-Europe. "Förderungsmöglichkeiten im Beitrittsgebiet." 35/91. 26. August 1991. Sonderbeilage s. 1-10.
- Agra-Europe. "Neue Länder Anpassungshilfen werden ausgezahlt." 44/91. 28. Oktober 1991. Kurzmeldungen s. 26.
- Agra-Europe. "Schlechter Zustand ostdeutsche Viehställe." 45/91. 4. November 1991. Länderberichte s. 28.
- Agra-Europe. "Brandenburg bekräftigt Forderung nach Übergangsregelungen für LPG." 48/91. 25. November 1991. Länderberichte s. 2-3.
- Agra-Europe. "LPG-Auflösung zum 1. Januar 1992." 52/91. 23. Dezember 1991. Sonderbeilage pp. 1-18.
- Bellmann, L. "Lohn- und Arbeitsmarktpolitik in den neuen Bundesländern," Wirtschaftsdienst. 1991/Viii. s. 402-404.
- Böse, C. "Auswirkungen der deutschen Vereinigung," Agra-Europe. 48/90. 26. November 1990. Sonderbeilage s. 1-11.
- Böse, C. und J. Welschhof. "Strukturelle Anpassungsprozesse und Politiken im Bereich neuen Bundesländer." Vortrag-32. Jahrestagung der Gesellschaft für Wirtschafts- und Sozialwissenschaften des Landbaues. 30. September-2. Oktober 1991. Göttingen.
- Collier, I.L. and H. Siebert. "The Integration of Post-Wall Germany." AEA Papers and Proceedings. Vol. 81, No. 2. pp. 196-201.
- Dabbert, S. et al. "DDR-Landwirtschaft unter EG-Marktbedingungen," Agra-Europe. 28/90. 9. Juli 1990. Markt + Meinung.
- Deutschland Nachrichten. "Arbeitslosigkeit auf neuen Höchststand: Im Dezember mehr als vier Millionen ohne Arbeit." German Information Center New York. 17. Januar 1997. s. 5.
- Dicke, H. "Auswirkungen der deutsche Integration auf die Landwirtschaft in der DDR." Die Weltwirtschaft. 1990-1. s. 138-148.

- DLG-Mitteilungen Agra-Inform. "Wie die Treuhand mit Boden umgeht." 3/1991. s. 67-69.
- Ehrenforth, W. "Bodenreform und Enteignungsentschädigung -- Ein Beitrag zum Urteil des Bundesverfassungsgericht vom 23.4.1991," Berichte über Landwirtschaft. Band 69, Nr. 4. November 1991. s. 489-516.
- Ehret, M. und W. Patzig. "Ist eine Wiederholung des 'Wirtschaftswunders' möglich? Perspektiven für die Entwicklung in den neuen Bundesländern." List Form 1991. Band 17, Nr. 2. s. 109-131.
- Ernährungsdienst. "Treuhand kann Boden langfristig verpachten." 16. Mai 1991. s. 1.
- Ernährungsdienst. "Zur Zeit sind wir in unserer Arbeit total blockiert." 17. November 1990. s. 2.
- Fink, M., R. Grajewski, R. Siebert, und K. Zierold. "Beschäftigungssituation von Frauen im ländlichen Raum der neuen Bundesländer," Berichte über Landwirtschaft. Band 72, Nr. 2. Mai 1994. s. 212-228.
- Fock, T. und S. Kreitmair. "Produktion und Wertschöpfung der Landwirtschaft in der BR Deutschland," Agrarwirtschaft. Band 40, Heft 3. 1991. s. 67-91.
- Frankfurter Allgemeine Zeitung. "Entschädigungsfond für Enteignungen vor 1949." 2. Mai 1991. s. 1-2.
- Frankfurter Allgemeine Zeitung. "Übersicht über wirtschaftliche Hilfen in den neuen Ländern." 2. Mai 1991. s. 18.
- Frankfurter Allgemeine Zeitung. "Altersübergangsgeld bis Mitte 1992." 13. Dezember 1991. s. 15.
- Frankfurter Allgemeine Zeitung. "Ost-Beschäftigung wird weiter sinken." 9. Januar 1992. s. 11.
- Frankfurter Allgemeine Zeitung. "300 000 Arbeitnehmer in der Ost-Landwirtschaft." 20. Januar 1992. s. 15.
- Geschäftsbericht der Deutschen Bundesbank für das Jahr 1990. 18. April 1991.
- Grings, M. "Der Nahrungsmittelverbrauch in der ehemaligen DDR: Mögliche Struktur- und Kaufkrafteffekte des Abbaus der Preissubventionen," Agrarwirtschaft und Agrarpolitik in der ehemaligen DDR im Umbruch. S. Merl und E. Schinke (ed). Gießener Abhandlungen zur Agrar- und Wirtschaftsforschung des europäischen Ostens. Band 178. Berlin 1991. s. 178-194.
- Großkopf, W. und K-H. Kappelmann. "Bedeutung der Nebenbetriebe der LPGen für die Entwicklungschancen im ländlichen Raum." Vortrag-32. Jahrestagung der Gesellschaft für Wirtschafts- und Sozialwissenschaften des Landbaues. 30. September - 2. Oktober 1991. Göttingen.

- Härtel, H-H. "Lohnpolitik im vereinten Deutschland! Vorschnelles Vereinheitlichen der Tariflöhne birgt Gefahren," Wirtschaftsdienst. 1991-1. s. 7-10.
- Heiber, J. "Milchquoten für die neuen Bundesländer," Welt der Milch. Band 45, Nr. 4. 25. Januar 1991. s. 67-68.
- Hein, R., D. Hoepfner, und S. Stapel. "Von der 'neuen ökonomischen Politik' zum wirtschaftlichen Zerfall - sozialer Anspruch und wirtschaftliche Realität in der gesamtwirtschaftlichen Entwicklung," Im Trabi durch die Zeit - 40 Jahre Leben in der DDR. E. Hölder (ed). Stuttgart: Metzler-Poeschel, 1992. s. 19-32.
- Herz, W. "Falsches Signal: Schaffen Subventionen den Aufschwung Ost?" Die Zeit. Nr. 8. 26. Februar 1993. s. 10.
- Isermeyer, F. "Umstrukturierung der Landwirtschaft in den neuen Bundesländern: Zwischenbilanz nach einem Jahr deutscher Einheit," Agrarwirtschaft. Band 10, Nr. 10. 1991. s. 294-305.
- Jahresgutachten 1990/91 des Sachverständigenrates zur Begutachtung der gesamtwirtschaftlichen Entwicklung. 11. Wahlperiode. Drucksache 11/8474. Sachgebiet 700.
- Kalatz, J. und M. Schindler. "Von Reparationen zum RGW-Lieferanten und zum Schalck-Imperium - der Außenhandel," Im Trabi durch die Zeit - 40 Jahre Leben in der DDR. E. Hölder (ed). Stuttgart: Metzler-Poeschel, 1992. s. 175-184.
- Kalmbach, P. "Die Produktivität ist kein geeigneter Maßstab für die Lohnentwicklung." Wirtschaftsdienst. 1991-1. s. 11-14.
- Kloos, W. "DDR-Landwirtschaft -- Überlegungen zur Weiterentwicklung," Agra-Europe. 13/90 26. März 1990. Dokumentation s. 1-17.
- Koester, U. and K. Brooks. "Agriculture and German Reunification." Draft July 1996.
- Kurjo, A. "Wo geht's lang in der DDR-Landwirtschaft?" Agra-Europe. 8/90. 19. Februar 1990. Situationsbericht. Markt + Meinung s. 11-23.
- Langbehn, C. "Kooperative Landwirtschaft - eine effiziente Organisationsform?" Agra-Europe. 23/90. 5. Juni 1990. Markt + Meinung s. 1-6.
- Lösch, R. "Probleme des Strukturwandels in der Agrarwirtschaft der neuen Bundesländer," IFO-Schnelldienst. 16-17/91. s. 41-52.
- Lückemeyer, M. "Die Privatisierung des 'Volkseigenen' Vermögen in der Landwirtschaft in den neuen Bundesländern." Vortrag-32. Jahrestagung der Gesellschaft für Wirtschafts- und Sozialwissenschaften des Landbaues. 30. September - 2. Oktober 1991. Göttingen.

- Münnich, M. und E. König. "Von der Not der Nachkriegsjahre zu gesichertem Einkommen - die Entwicklung des Lebensstandards," Im Trabi durch die Zeit - 40 Jahre Leben in der DDR. E. Hölder (ed). Stuttgart: Metzler-Poeschel, 1992. s. 97-110.
- Nause, G. "Von der Enteignung der Bauern zu spezialisierten Großbetrieben - die Landwirtschaft geplant zur industriemäßigen Produktion," Im Trabi durch die Zeit - 40 Jahre Leben in der DDR. E. Hölder (ed). Stuttgart: Metzler-Poeschel, 1992. s. 185-198.
- Paarlberg, P.L. "Sectoral Adjustments in Eastern Germany Due to Market Forces," Review of International Economics. Vol. 2, No. 2. June 1994. pp. 112-122.
- Piper, N. "Abschwung Ost: In den neuen Bundesländern geht das Wachstum trotz Milliardentransfers zurück. Jetzt ist vor allem Vernunft bei den Löhnen gefragt," Die Zeit. Nr. 5. 2. Februar 1996. s. 11.
- Pollack, P. "DDR-Landwirtschaft braucht einen gewaltigen Rationalisierungsschub," Agra-Europe. 28/90. 9. Juli 1990. Länderberichte s. 10-22.
- Pötzsch, K. "Von 5 Pfennigen für ein Brötchen bis 700 Mark für ein Fernsehgerät - die Preise in der Planwirtschaft," Im Trabi durch die Zeit - 40 Jahre Leben in der DDR. E. Hölder (ed). Stuttgart: Metzler-Poeschel, 1992. s. 111-120.
- Saretzki, H-U., R. Schenke, and G. Glende. "Von der Lebensmittelkarte zur Warteliste für das Auto - die Planwirtschaftliche Entwicklung des Einzelhandels," Im Trabi durch die Zeit - 40 Jahre Leben in der DDR. E. Hölder (ed). Stuttgart: Metzler-Poeschel, 1992. s. 139-152.
- Scharrer, H-E. "Schocktherapie statt Gradualismus," Wirtschaftsdienst. 1990-11. s. 75-77.
- Schmitt, G. "Können sich die Landwirtschaftlichen Produktionsgenossenschaften (LPG) der DDR in der Europäischen Gemeinschaft als wettbewerbsfähig erweisen?" Agra-Europe. 24/90. 11. Juni 1990. Sonderbeilage.
- Scholz, H. "Deutsch-deutsch Agrarproduktion," Agra-Europe. 21/90. 21. Mai 1990. Sonderbeilage.
- Scholz, H. "Lage der Landwirtschaft in den neuen Bundesländern," Berichte über Landwirtschaft. Band 70, Nr. 2. Juni 1992. s. 161-173.
- Schrader, J-V. "Anpassungsprozesse in der ostdeutschen Landwirtschaft: Analyse und Bewertung." Kiel Discussion Papers Nr. 171/72. Institut für Weltwirtschaft Kiel. August 1991.
- Schrader, J-V. "Integration der deutschen Agrarsektoren: Wettbewerb der Standorte und Strukturen oder Übernahme westlicher Reglementierungen?" Die Weltwirtschaft. 1990/1. s. 125-137.
- Sinn, G. und H-W. Sinn. Kaltstart: Volkswirtschaftliche Aspekte der deutschen Vereinigung. Tübingen: J.C.B. Mohr, 1991.

Spahn, H-P. "Das erste und das zweite deutsche Wirtschaftswunder,"
Wirtschaftsdienst. 1991-11. s. 73.

Statistisches Jahrbuch für die Bundesrepublik Deutschland. various issues.

Statistisches Jahrbuch der Deutschen Demokratischen Republik. various issues.

Tangermann, S. "European Agriculture in the 1980's: Internal Reform, 1992, and External Pressures." J.S. McLean Lecture presented at the University of Guelph, Guelph, Ontario, Canada. February 20, 1990.

Teller, J. "Zum Außenhandel der DDR mit landwirtschaftlichen Erzeugnissen,"
Agrarwirtschaft. Band 39, Heft 5. 1990. s. 141-148.

Tietmeyer, H. "Die innerdeutsche und die europäische Währungsunion vor dem Hintergrund der Währungsreform 1948," Deutsche Bundesbank: Auszüge aus Presseartikeln. Nr. 44. 14. Juni 1991. s. 1-6.

Thanner, B. "Modernisierung der DDR-Wirtschaft durch bundesdeutsche Wirtschaftshilfe?" IFO-Schnelldienst. 33/89. s. 3-5.

Ulbricht, G. "Ernährung und Agrare Veredlungswirtschaft in der früheren DDR,"
Agrarwirtschaft. Band 40, Heft 5. 1991. s. 134-138.

United States Department of Agriculture, Economic Research Service. Western Europe: Agriculture and Trade Report. RS-92-4. December 1992.

Vankai, T.A. The Feed-Livestock Economy of East Germany: Prospects to 1980. FAER No. 110. Economic Research Service, U.S. Department of Agriculture. September 1975.

Waigel, T. "Ein Jahr kann nicht alle Wünsche erfüllen," Deutsche Bundesbank: Auszüge aus Presseartikeln. Nr. 49. 1. Juli 1991. s. 10-11.

Weinschenk, G., et al. "DDR-Landwirtschaft unter EG-Marktbedingungen," Agra-Europe. 28/90. 9. Juli 1990. Markt + Meinungen s. 1-8.

Wirtschaftswoche. "Ein neues Wunder." Sondernummer DDR. 4. April 1990. s. 20-26.

Table 1: Producers and Farm Input Price Indices for Selected Goods in the New States of Germany

	1989	1990 ¹	1991	1992	1993	1994	1995
				--1989 = 100--			
Producer:							
Agriculture	100		35.4	36.6	34.0	35.5	
Grains/Pulses	100		49.1	48.9	42.4	39.6	
Slaughter animals	100		27.2	29.2	25.2	26.0	
Milk	100		31.4	33.8	34.0	33.2	
Electricity/Gas	100	95.2	127.0	134.3	140.9	141.7	143.6
Mining	100	87.8	87.6	93.1	93.9	93.6	90.5
Production Goods	100	52.5	51.8	51.3	51.4	53.6	55.3
Investment Goods	100	67.7	64.8	64.3	64.7	64.9	66.0
Consumer Goods	100	52.7	52.0	52.1	53.5	54.5	56.7
Food Products	100	68.6	67.4	69.7	69.3	69.3	70.1
Resident Construct.	100	146.7 ²	164.3	182.4			
Farm Inputs:							
Total	100		74.5	79.6	84.2	87.7	
Chemicals	100		39.3	37.0	35.3	35.0	
Feed	100		47.6	47.7	46.0	44.2	
Seed	100		75.3	82.4	80.3	77.1	
Fuel	100		87.0	90.1	91.1	92.9	
Repair	100		112.5	115.8	121.7	124.9	
Machinery	100		56.6	57.1	58.8	59.7	
Building	100		143.9	173.1	183.2	189.1	

¹Second half 1990.

²Average August and November 1990.

Source: Statistisches Jahrbuch, various issues.

Table 2: Output Composition of the Economy in the New Federal States⁵, Share of GDP

	1989 ¹	1990 ²	1991	1992	1993	1994	1995 ³
				- percent -			
Agri/For/Fish.	10.4	2.6 ³	1.3	1.5	1.3	1.8	1.9
Manufacturing	77.5	41.6	35.2	33.7	35.4	37.1	36.5
Distribution/Transp.	9.5	19.7	17.2	15.5	11.9	12.5	11.9
Service		15.8	22.9	25.7	28.0	27.9	27.5
State, Other ⁴	2.6	20.2	23.4	23.7	23.4	20.5	22.3

¹East German social accounting.

²Second half 1990 only.

³Calculated as a residual of total less other categories.

⁴Includes activities in private households.

⁵Excludes Berlin.

Source: Statistisches Jahrbuch, various issues.

Table 3: Indices of Net Production in Manufacturing for the New Federal States

	Personnel	1990		1991	1992	1993
	Cost	July	2 nd half			
	Percent			- second half 1990 = 100 -		
Electricity/Gas	12.7		100	103.0	97.0	103.3
Mining	32.1		100	70.0	50.6	39.3
Basic Producer Goods	28.6	129.9	100	75.5	78.7	85.8
Investment Goods	42.4	115.2	100	55.9	51.0	55.9
Consumer Goods	52.6	105.4	100	68.7	71.7	80.6
Food Products	14.7	97.8	100	90.2	94.8	100.2
Construction Serv.	--	--	100	98.9	129.3	157.3

¹New Federal States and East Berlin only – 1991.

Source: Statistisches Jahrbuch, various issues.

Table 4: Indices of Crop Production in the New Federal States of Germany

Year	Total						Sugar	
	Grain	Wheat	Rye	Barley	Oats	Potat.	Beets	Rape-seed
				- 1989 = 100 -				
1989	100	100	100	100	100	100	100	100
1990	108.0	120.5	97.2	102.4	119.9	72.2	117.2	87.7
1991	108.9	137.2	69.8	108.2	59.9	29.7	97.9	228.8
1992	84.2	121.6	41.5	77.4	30.1	25.6	100.5	253.7
1993	97.9	147.1	60.4	73.1	61.8	28.4	108.6	363.0
1994	105.9	159.5	79.7	73.6	54.2	16.3	84.0	412.6
1995	127.6	184.1	115.3	84.9	48.0	19.8	99.6	385.2

Source: Statistisches Jahrbuch, various issues.

Table 5: Indices of Livestock Herds in the New Federal States of Germany – December

	Cattle		Sheep	Swine		Hens ¹
	Total	Milk		Total	Sows	
			- 1989 = 100 -			
1989	100	100	100	100	100	---
1990	86.4	80.9	55.9	73.1	60.1	68.7
1991	57.0	56.4	30.8	39.1	43.7	---
1992	49.4	53.0	26.1	36.6	43.5	47.7
1993	49.1	54.1	25.9	33.1	37.9	---
1994	50.6	53.2	25.8	28.0	31.2	60.0
1995	51.0	53.2	26.8	26.3	30.3	---

¹ Surveys every 2 years, 1988 = 100.

Source: Statistisches Jahrbuch, various issues.

Table 6: Cost of Living Indices, New Federal States of Germany

	Change Vs. ave	Feb. 1991	1991	1992	1993	1994	1995
	Percent	1998					
				- 1991 = 100 -			
All worker households	9.7		100	113.5	125.4	130.0	132.7
Food/Bev./Tob.	20.2		100	102.7	104.3	106.0	107.0
Clothing	-29.6		100	101.2	102.5	103.1	103.2
Rent	2.5		100	228.3	365.2	404.5	426.1
Energy	130.6		100	140.1	143.1	136.6	136.3
Furniture	-17.1		100	102.2	104.0	104.9	105.8
Health	38.3		100	114.0	124.2	132.3	136.6
Transport./Inform.	-2.2		100	106.4	112.0	116.5	116.5
Education/Leisure	20.4		100	103.5	108.8	112.8	115.8
Other	31.9		100	108.4	119.4	127.6	131.6

Source: Statistisches Jahrbuch, various issues.

Table 7: Expenditures for Middle Income Households in the New States of Germany¹

	1989 ²	1990	1991	1992	1993	1994	1995
Absolute Expenses			- Marks per household per month -				
Feed/Bev./Tob.	711	719.5	723.62	780.68	797	802	825
Clothing	285	240.5	254.64	240.52	258	236	223
Rent/Energy	88	102.5	228.35	424.63	605	665	722
Furniture	--	282.0	278.70	599.09	317	340	316
Health	--	54.0	79.81	103.89	102	105	106
Transp./Inform.	--	437.0	632.56	702.27	641	700	650
Educ./Leisure	--	218.5	307.63	331.70	385	377	382
Other	--	77.0	63.67	82.61	97	120	141
Total	1814	2132.5	2568.99	2965.38	3202	3345	3364
Expenditure Shares			- Percent -				
Food/Bev./Tob.	39.2	33.7	28.2	26.3	24.9	24.0	24.5
Clothing	15.7	11.3	9.9	8.1	8.1	7.1	6.6
Rent/Energy	4.9	4.8	8.9	14.3	18.9	19.9	21.5
Furniture	--	13.2	10.8	10.1	9.9	10.2	9.4
Health	--	2.5	3.1	3.5	3.2	3.1	3.2
Transp./inform.	--	20.5	24.6	23.7	20.0	20.9	19.3
Educ./Leisure	--	10.2	12.0	11.2	12.0	11.3	11.4
Other	--	3.6	2.5	2.8	3.0	3.6	4.2

¹Four person professional and worker household, middle income.

²East German marks

Source: Statistisches Jahrbuch, various issues.

**Table 8: Monthly Household Consumption of Selected Foods,
East and West Germany¹**

Food	Units	1989 ²	1990	1991	1992	1993	1994	1995
1995								
East.Germany								
Meat	Gr.	12630		11530	13089	13218	13121	
Fish	Gr.	350		221	227	270	281274	
Milk	l.	18.0		15.8	16.8	16.4	16.516.4	
Cheese	Gr.	2570		2198	2395	2620	27172947	
Eggs	No.	38		31	29	29	3029	
Butter	Gr.	3000		1164	1286	1340	13461311	
Animal Fat	Gr.	-		63	64	60	5558	
Margarine	Gr.	1460		2907	2732	2880	26952507	
Bananas	Gr.			6202	5168	3911	31273360	
Potatoes	Gr.			6217	6852	7442	88528753	
Bread	Gr.	13980		11719	10658	10359	100689781	
Sugar	Gr.	2840		1198	1503	1417	14521411	
Wheat Flour	Gr.	-		617	760	820	782771	
Rice	Gr.	-		175	213	253	260303	
W. Germany								
Meat	Gr.	13063	13121	13354	12578	12329	1189112076	
Fish	Gr.	315	330	335	318	322	323339	
Milk	l.	19.0	18.4	19.2	19.4	19.6	19.619.1	
Cheese	Gr.	3471	3435	3504	3673	3592	36083730	
Eggs	No.	41	40	40	38	36	3534	
Butter	Gr.	1142	1109	1074	1073	1117	10871139	
Animal Fat	Gr.	34	37	34	40	49	4640	
Margarine	Gr.	1819	1777	1724	1697	1672	1571	1517
Bananas	Gr.	3254	3256	3330	3360	3025	2863	2949
Potatoes	Gr.	7771	7861	7857	6869	6488	6299	6248
Bread	Gr.	8918	8850	8751	8539	8618	8177	8081
Sugar	Gr.	1729	1576	1565	1712	1727	1604	1625
Wheat Flour	Gr.	1355	1401	1405	1587	1563	1531	1503
Rice	Gr.	459	471	508	457	522	470	500

¹Four person household, professional and worker, middle income.

²1989 East German data, professional and worker couple with 2 children.

Source: Statistisches Jahrbuch, various issues.