No. 86

Temporal Instability and Redistributive Dynamics of Gross Transfers Arising from EU's Common Agricultural Policy*

by

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Giessen, November 2007

* This study was undertaken in connection with the project "Competitive Disadvantages for Agriculture? Theoretical Concept and Empirical Measurement" (D1) of the Collaborative Research Centre "Land Use Concepts for Remote Regions". The author benefited in an earlier version of the paper from helpful comments by the participants of the Congress of the European Association of Agricultural Economists (EAAE), Copenhagen, Denmark, 24-27 August 2005 and the EAAE PhD Seminar 2005 in Wageningen, the Netherlands, 22-23 September 2005. Funding by the German Research Foundation is gratefully acknowledged. Thanks are also due to the colleagues of the Institute of Agricultural Policy and Market Research at the University of Giessen for their valuable suggestions.

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Abstract

Depending on the type of policy measure to assist agriculture, support levels can differ over time and across regions. This paper assesses the effects of the Common Agricultural Policy (CAP) reforms during the 1990s on the fluctuation and distribution of gross transfers to producers. The empirical analysis of instability is based on the index proposed by Cuddy and Della Valle, which corrects for underlying trends in the time series. Results indicate that CAP transfers have become more stable by moving from market price support to direct area and headage payments. To reveal territorial impacts of the adjustments in EU agricultural policy a regionalised concept of producer support estimates (PSEs) is adopted. For the German federal states, significant differences in CAP support levels are observed. Exploring the distributional dynamics, the findings show that those disparities across regions have increased throughout the period under study.

Keywords

Convergence, Cuddy-Della Valle index, direct area and headage payments, market price support, producer support estimate (PSE)

1. Introduction

In the 1990s major adjustments of the Common Agricultural Policy (CAP) took place by moving partially from market price support to direct area and headage payments. To estimate the likely impacts of these reforms on domestic farmers, economists have undertaken notable efforts in the past. A recent literature review of Andersson (2004) in this field reveals, however, that mainly the effects on production have been analysed, while empirical evidence on the instability and distributional dynamics of CAP transfers is limited. For instance, Tarditi and Zanias (2001), Zanias (2002) and the Arkleton Centre for Rural Development Research (Arkleton Centre, 2003) investigate regional income redistribution generated by CAP measures and alternative policy scenarios. In all cases, significant differences in territorial support levels were found. While these studies focus on impacts of agricultural policies on EU cohesion, they do not explicitly assess implications for the cross-sectional dispersion of support through time. An exemption are Anders et al. (2004) who examine trends in the territorial incidence of CAP support within one federal state of Germany, that is Hesse. The authors conclude that between 1986 and 1999 transfers have become increasingly unequal across regions.

The purpose of this paper is to illustrate the effects of EU agricultural policy reforms in the 1990s on gross transfers to producers over time and across regions. Important questions are whether direct area and headage payments reduce or increase the fluctuation of CAP support and to what extent the distribution is affected. The empirical analysis is based on producer

support estimates (PSEs) computed by the Organisation for Economic Co-operation and Development (OECD). Instability through time is measured with the index proposed by Cuddy and Della Valle (1978), which accounts for possible trends in time series. For assessing territorial impacts and dynamics, Germany was chosen as the country of analysis, as its federal states reveal highly diverse farming conditions and structures among each other. A regionalised PSE approach suggested by Anders et al. (2004) appears to be a useful construct in calculating the territorial incidence of CAP support. To examine the cross-sectional dispersion of transfers over time, the concepts of beta and sigma convergence developed in macroeconomic studies (cf. Barro and Sala-i-Martin, 1990) are applied.

The paper is structured as follows. The next section provides a short overview of the adjustments in CAP policy instruments during the 1990s. It discusses intertemporal and interregional implications for gross transfers theoretically and derives two hypotheses. Section 3 describes the methodology of measurement and the data used for analysis. The paper then presents empirical results in Section 4. Concluding remarks are offered in the final section.

2. CAP reforms in the 1990s and theoretical implications for gross transfers

Since its inception in the 1960s, the CAP had experienced merely small changes for decades. Market price support was the main policy measure to subsidise domestic agriculture. Assistance was not equal across commodities, but some gained more than others. Due to increasing budgetary expenses and trade negotiations within the General Agreement on Tariffs and Trade (GATT), the CAP had to change. In the so-called McSharry reform of 1992 the instruments of the CAP were shifted partially from market price support to direct area and headage payments. The Agenda 2000 in 1999 deepened the McSharry reform and moved policy measures more toward this form of direct producer payments. Despite its adjustments in the 1990s, market price support is still the EU's major instrumentation to subsidise domestic farmers. As the left-hand side of Table 1 indicates, the share of market price support in CAP transfers has declined significantly over the last years. However, more than half of the assistance to agricultural producers still accrues from this instrument. Direct payments based on area planted or animal numbers have become increasingly important and between 2002 and 2004 they account for more than one quarter of total support. The right-hand side of Table 1 shows the percentage PSE, which measures transfers as a ratio of gross farm receipts, across key commodities and over time. It points out that EU agricultural support differs substantially for the products under consideration. Both the coefficient of variation and geometric mean of the

percentage PSE have reduced slightly during 1988 and 2004 (by 5.0 and 2.5 percentage points, respectively).

Table 1: Agricultural support within the EU

Composition (share in PSE)			Level (Percentage PSE)		
	1986-88	**2002-04**		**1986-88**	**2002-04**
Market Price Support	86.0	54.5	Beef	55	73
Payments based on			Milk	70	40
input used	5.2	8.2	Pigmeat	16	24
output	5.2	3.5	Poultrymeat	24	40
area planted/animal numbers	2.8	27.8	Sheapmeat	70	53
input constraints	0.7	4.8	Coarse grains	55	46
historical entitlements	0.0	1.2	Wheat	51	43
overall farming income	0.0	0.0	Rapeseed	59	36
Total	100.0	100.0	Sugar	60	60

Notes: 1986 to 1988 EU-12, 2002-2004 EU-15 and EU-25, respectively.
Source: Calculations based on data from the OECD producer support estimate indicators.

In summary, reforms of the CAP have resulted in substantial adjustments regarding the composition of policy instruments used, while the overall level of support has remained almost constant. The partial renunciation from market price support and expansion of direct area and headage payments can have important effects on the instability and distribution of gross transfers. Given this background the remainder of this section concludes by deriving a number of testable hypotheses.

Let us start by looking at the theoretical implications of the McSharry and Agenda 2000 reforms on support levels through time. As price fixing within the EU was independent from the world market (cf. Thompson et al., 2000: 724), the monetary value of transfers arising from market price support was determined by the quantity produced and the gap between domestic and world prices. In contrast, assistance from direct area and headage payments, by definition, only depends on land under cultivation and animal numbers. Due to the high variability of production and world prices compared to annual changes in area planted or animal numbers, market price support is expected to fluctuate more than direct area and headage payments. The first hypothesis therefore simply states that gross transfers to producers have become more stable with the EU agricultural policy reforms in the 1990s.

Next, let us focus on the distributional impacts of decreasing market price support and increasing direct area and headage payments. As for both of these policy instruments transfers are related to specific products, regions benefit in accordance with their output mix. Direct

area and headage payments under the CAP were designed to compensate farmers for the cuts in market price support. Thus, the second hypothesis is that ceteris-paribus these policy reforms do not reduce the heterogeneous territorial incidence of agricultural support. Moreover, distributional dynamics of this variable are mainly driven by changes in the regional output mix.

3. Data inputs and analytical framework

The source of data used for the empirical analysis has been annual statistics of the OECD on PSEs. This indicator, described in detail by Cahill and Legg (1989) and Legg (2003), sums up the annual monetary transfers from domestic consumers and taxpayers to producers arising from agricultural policy measures. In algebraic form the absolute PSE to a commodity produced is

$$PSE = (P_d - P_w) * Q - L + PP, \quad (1)$$

where P_d and P_w are domestic and world market prices, respectively, Q is the level of production, L are levies on producers and PP is all other budgetary-financed support. The latter comprises payments based on various criteria, i.e. area planted and animal numbers, output, historical entitlements, input use and constraints, overall farming income, and miscellaneous. While initially used to quantify the aggregate level of support to agriculture, the OECD has increasingly focussed on the composition of the PSE in the past years (cf. Tangermann, 2005: 7). Based on the statistics supplied by OECD, the instability of transfers arising from different policy instruments can be assessed. The dataset covers the period from 1986 to 2004 and it is first used to calculate the fluctuations of market price support and area and headage payments. The contribution of area and headage payments to the stability of total CAP support is then analysed by comparing explicitly situations with and without this instrument. The fluctuation of transfers through time is calculated with the measure of instability developed by Cuddy and Della Valle (1978: 82). This method corrects the coefficient of variation, if data are scattered around a positive or negative trend line. The Cuddy-Della Valle index (I) is given as follows:

$$I = CV * \sqrt{1 - \bar{R}^2}, \quad (2)$$

where CV is the coefficient of variation, defined as the ratio of a samples' standard deviation to its mean, and $\bar{R}^2$ is the adjusted coefficient of determination of the trend regression which best fits the time series. For determining $\bar{R}^2$ a linear and nonlinear (log linear) trend equation

have been estimated in this paper. If the F-test is statistically significant at the five percentage level, the index *I* is used to indicate the fluctuation of CAP transfers. If data are non-trended, the coefficient of variation is calculated.

As Duggan (1979) shows, the measure proposed by Cuddy and Della Valle is affected in the presence of autocorrelated error terms. To test for this special problem with time series data the Durbin-Watson statistic is used. If the null hypothesis of no first-order serial correlation has to be rejected or if the test is inconclusive at the five percentage level of significance the Cochrane-Orcutt iterative procedure is applied. In doing so, it is always assumed that the error term follows an AR(1) model (cf. Aiello, 1999: 75).

After having described the measure of instability used in the empirical analysis, a concept for discovering the distribution and change of agricultural support across regions is presented next. Anders et al. (2004: 107) suggest a regionalisation of OECD's PSE concept to assess the territorial incidence of CAP transfers. This approach can be viewed as a top-down procedure taken in two stages. First, the so-called Unit PSE, defined as the total value of support per unit of the commodity produced, is multiplied by the level of production within a specific area. In the second stage, these product-specific support values are added to obtain an indicator for regional gross transfers. The advantage of the proposed method is that it requires only detailed territorial data on agricultural production volumes while assuming equal Unit PSEs across different areas. An alternative to the top-down procedure is to collect data on each component of equation (1) at the more localised level. However, the necessary information for the latter approach is often not available, making such bottom-up procedure a cumbersome or even impossible task[1]. Given the difficulties in compiling a consistent regional dataset from the various statistical sources this paper chooses the approach developed by Anders et al. (2004) for analysing the territorial impacts of the CAP. Assuming *N* commodities supported by agricultural policy measures the regionalised PSE is defined as

$$(3) \qquad PSE^{j} = \sum_{i}^{N} \left(\frac{PSE_{i}^{eu}}{Q_{i}^{eu}} * Q_{i}^{j} \right),$$

where superscript *j* refers to the region under consideration, *eu* is the European Union and Q_i is the quantity produced of commodity *i* (i = 1, 2, … , N). This equation is applied to Germany and its federal states over the period 1991 to 2004. Among the list of commodities for which the OECD derives PSE values a set of nine is selected: wheat, other grains, rapeseed,

[1] The bottom-up procedure has been applied at the NUTS 0 (Zanias, 2002), NUTS 1 (Tarditi and Zanias, 2001) and NUTS 3 level (Arkleton Centre, 2003) to evaluate the territorial impacts of the CAP among EU regions. These studies show that this approach becomes more complex the smaller the areas under consideration are.

sugar beets, milk, beef, pigmeat, sheepmeat and poultry. These commodities receive approximately 75 per cent of EU's absolute PSE and cover main products in German agriculture. Regional data on quantities for the chosen commodities and other agricultural variables have been obtained from the Federal Statistical Office and the Zentrale Markt- und Preisberichtstelle. To account for the differential size of the federal states, gross transfers are related to the utilised agricultural area[2]. The relevant indicator to measure the redistributive impacts of CAP support is thus

$$(4) \qquad PSEha^{j} = \frac{PSE^{j}}{uaa^{j}},$$

where uaa^{j} denotes the utilised agricultural area of region *j*.

Barro and Sala-i-Martin (1995: 383) propose the concepts of beta and sigma convergence in order to measure macroeconomic convergence. These concepts are applied here for analysing changes in the distribution of agricultural support throughout the time period under study. The former occurs when regions with lower initial support levels receive more CAP transfers than those with higher initial levels. Applied to this paper and according to Maurseth (2001: 251-253) beta convergence is derived as

$$(5) \qquad \frac{1}{T} log\left(\frac{PSEha^{j}_{2004}}{PSEha^{j}_{1991}}\right) = \alpha + \beta log\left(PSEha^{j}_{1991}\right) + \gamma X + u,$$

where *T* is the time from the initial to the last year, $PSEha^{j}$ are regionalised gross transfers to agriculture (cf. equation 4) in 2004 and 1991, respectively, *X* denotes a vector of other explanatory variables, and u_i is the error term. The left-hand side of equation (4) is the average annual growth rate in CAP support per hectare and is taken as the dependent variable. Beta convergence exists for a sample of regions, if in a cross-section regression the coefficient β is negative and statistically significant at the five percentage level. According to whether equation (4) includes other explanatory variables (e.g. regional dummy variables) or not, one distinguishes conditional from unconditional beta convergence. The second concept used here is that of sigma convergence which looks at the dispersion of some variable across regions over time. Let CV_t be the coefficient of variation of the PSE per hectare over all regions in time t, sigma convergence can be calculated as

$$(6) \qquad CV_t = \alpha + \beta t + u,$$

[2] The number of farms is not taken as a basic unit, because of the clear division between a large-scale farming eastern part (the former German Democratic Republic (GDR)) and a small and medium-scale farming part in the remainder of Germany.

where t is the trend and u_i is the error term of an ordinary least squares estimation. If the CV tends to fall over time, then gross transfers are converging. While conceptually different, the two measures presented above are related in the sense that beta convergence is a necessary but not a sufficient condition for sigma convergence (cf. Sala-i-Martin, 1996: 1330)[3]. For this reason, sigma convergence can be viewed as a stricter criterion than beta convergence.

4. Empirical Results

The estimated variation of CAP support over time is reported first and is followed by an investigation of the way in which transfers are distributed across regions. An initial hypothesis developed in this paper was that the instability of gross transfers has reduced since EU's major agricultural policy reforms in the 1990s. In this regard, major changes took place for grains and beef with a cut in support prices by a total of 50 and 35 per cent, respectively. To compensate for revenue losses in these markets direct area and headage payments were introduced and increased. The upper part of Table 2 summarises the arithmetic means and variation indices of CAP transfers arising from market price supports and direct area and headage payments for wheat, coarse grains, beef and the total of all commodities between 1986 and 2004. During the period 1986 to 2004 the average value of market price support to EU farmers exceeds the value of direct area and headage payments with the exception of wheat. A comparison of instability indices for these instruments shows that transfers arising from market price support fluctuate more than direct area and headage payments, but not for the aggregate of all commodities. The high instability of market price support is not surprising given the variability of world prices for agricultural products. Besides and in particular for crops, annual yield variations are a main source of fluctuation. To test whether the fundamental CAP reforms in the 1990s stabilise transfers to EU farmers the lower part of Table 2 gives variation indices for the situations with and without direct area and headage payments. The results confirm that the shift to this policy measure decreases the fluctuation of absolute PSEs on the single markets. The most substantial reduction is realised for wheat (-61.4%), followed by coarse grains (-54.1%) and beef (-38.7%), corresponding to the share of direct area and headage payments in total support for the commodity under consideration.

[3] A process of sigma convergence implies not only $\beta < 0$, but also $-1 < \beta$ to rule out that regions with low initial values for the analysed measure catch up and get ahead of regions with higher values (Maurseth, 2001: 252).

Table 2: Instability indexes of CAP gross transfers to EU farmers, 1986-2004

	Wheat	Coarse grains	Beef	All commodities
(i) Market Price Support				
Arithmetic mean (EURm)	3 201	3 932	9 762	62 637
Variation Index	52.8	36.0	16.1	12.8
Instability measure	I^n	I^n	CV	I^n
(ii) Area and headage payments				
Arithmetic mean (EURm)	4 461	3 413	4 022	17 362
Variation Index	18.7	20.8	13.2	13.3
Instability measure	I^p	I^p	I^p	I^p
(iii) Absolute PSE				
Arithmetic mean (EURm)	8 648	8 370	15 626	94 103
Variation Index	15.9	13.3	9.5	7.5
Instability measure	I^p	I^p	I^p	I^p
(iv) Absolute PSE excluding area and headage payments				
Arithmetic mean (EURm)	4 187	4 975	11 604	76 742
Variation Index	41.2	29.0	15.5	10.6
Instability measure	I^n	I^n	CV	I^n
Stabilising effect of direct area and headage payments on absolute PSE (%)				
Reduction in instability	*- 61.4*	*- 54.1*	*- 38.7*	*- 29.2*

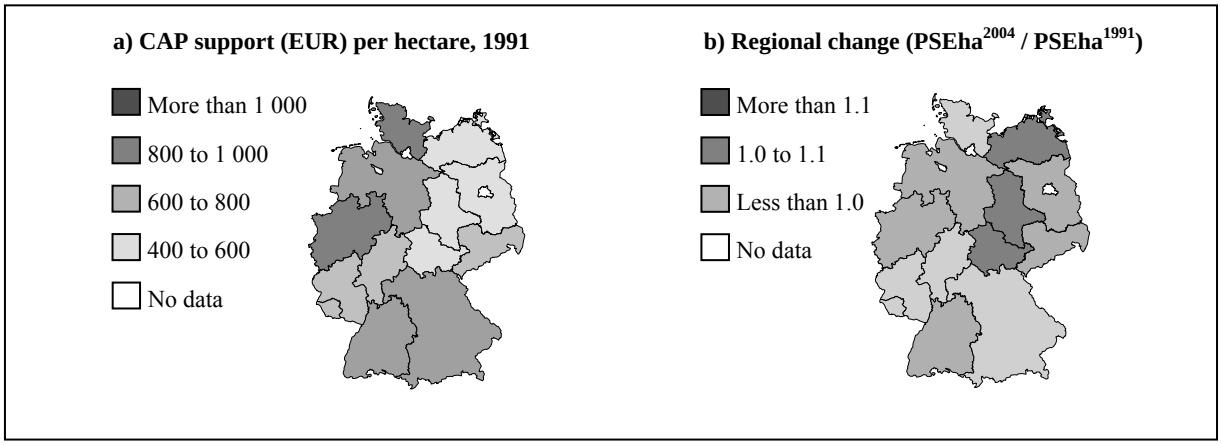
Notes: CV is the coefficient of variation, I is the coefficient of variation corrected by the fitness of a trend regression. Superscript p (n) refers to a positive (negative) trend in the observed time series. The stabilising effect of direct area and headage payments was calculated as *[(variation index iii - variation index iv) / variation index iv] * 100*.
Source: Calculations based on data from the OECD producer support estimate indicators, various years.

Since the instability of agricultural support was lowered in the analysed markets, the question arises if and how the territorial distribution of gross transfers has changed as a consequence of the fundamental CAP reforms in the 1990s. For empirical analysis a new data set ranging from 1991 to 2004 is used, given the reunification of East and West Germany in 1990. The left-hand side of Figure 1 shows regional gross transfers expressed per hectare for 1991 and reveals huge differences in this variable.

Areas of north-western and southern Germany are among the highest beneficiaries while in the eastern, former GDR regions of the country the lowest support levels are found. This peculiar situation is due to the fact that CAP support on a per-hectare basis is greater for animal products than for crops, and is thus closely related to livestock density[4]. The eastern part of Germany, which exhibits the lowest livestock densities (except for Saxony), therefore tended to receive lower CAP transfers.

[4] The Bravais correlation coefficient between CAP support per hectare and a livestock density index is 0.95 in 1991 and statistically significant at the 99.9 percentage level (two-tailed).

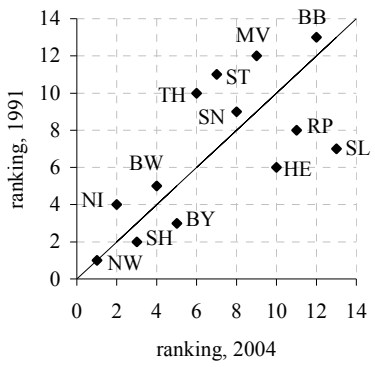
Figure 1: CAP support and its regional change in Germany



Notes: The results refer to hectare of utilised agricultural area.
Source: Calculations based on data from the OECD producer support estimate indicators, Federal Statistical Office and Zentrale Markt- und Preisberichtstelle, various issues and years.

The regional change in gross transfers is displayed on the right-hand side of Figure 1. For some areas agricultural support has decreased between 1991 and 2004, whereas others and especially the eastern part of Germany with low initial values indicate an increase. These developments are mainly driven by changes in territorial livestock densities[5]. During the analysed period the latter shows the largest enhancements in Mecklenburg-Western Pomerania, Saxony-Anhalt, and Thuringia. By contrast, Hesse, Saarland and Rhineland-Palatinate exhibit the most substantial decline in livestock density. A closer inspection of the dynamics in the distribution is given in Figure 2, which graphs for each federal state its ranking in the first and last year.

Figure 2: Ranking of regions by their CAP support levels per hectare, 1991 and 2004



BB	=	Brandenburg
BW	=	Baden-Württemberg
BY	=	Bavaria
HE	=	Hesse
MV	=	Mecklenburg-Western Pomerania
NI	=	Lower Saxony
NW	=	North Rhine-Westphalia
RP	=	Rhineland-Palatinate
SL	=	Saarland
SH	=	Schleswig-Holstein
SN	=	Saxony
ST	=	Saxony-Anhalt
TH	=	Thuringia

Notes: The diagonal is not a regression line, but divides the sample into two groups.
Source: Calculations based on data from the OECD producer support estimate indicators, Federal Statistical Office and Zentrale Markt- und Preisberichtstelle, various issues and years.

[5] This point is indicated by the Bravais correlation coefficient between changes in CAP support per hectare and changes in livestock density for the period 1991 and 2004. It amounts to 0.90 and is statistically significant at the 99.9 percentage level (two-tailed).

It illustrates that North Rhine-Westphalia received the highest support levels per hectare both in 1991 and 2004. The diagonal divides the federal states into two groups. Those above the line are regions that forged ahead of others in view of support while those below shifted down.

The standard deviation of the change in ranking is 3.1. Figure 2 reveals, however, that there is more mobility in the lower ranks of the sample than in the upper. To analyse whether disparities in support levels across regions in Germany exacerbate or reduce during the period of fundamental CAP reforms in the 1990s, regressions were run for beta and sigma convergence (Table 3). First, results show no unconditional beta convergence for the time period under study. Considering that the lowest initial support levels were found in the eastern part of Germany, a dummy variable was then defined representing their regional characteristics. Estimation results are again not statistically significant identifying also absence of conditional beta convergence. It can therefore be concluded that there is no evidence that areas with low initial support levels caught up with favoured areas between 1991 and 2004.

Table 3: Estimating convergence in CAP support across German regions, 1991-2004

	Variable	Coefficient	t-value	F-statistic
Unconditional beta convergence	Intercept (α)	0.04	0.81	
	log PSEha^j 1991 (β)	-0.01	-0.84	0.42
Conditional beta convergence	Intercept (α)	-0.10	-1.57	
	log PSEha^j 1991 (β)	0.03	1.50	
	Dummy east (γ)	0.02	2.62	3.97
Sigma convergence	Intercept (α)	27.21	18.72	
	Time (β)	0.56	3.28	10.79*

Notes: Equations were estimated with ordinary least squares. * is statistically significant at the 99%-level.
Source: Calculations based on data from the OECD producer support estimate indicators, Federal Statistical Office and Zentrale Markt- und Preisberichtstelle, various issues and years.

Testing for sigma convergence reveals that the dispersion of CAP support has increased over the period analysed here. The interregional coefficient of variation grew significantly by 0.56 percentage points annually. This estimate is larger than the 0.39 estimate of Anders et al. (2004: 117), obtained using data from 1986 to 1999 for the federal state of Hesse. In general, Table 3 confirms the expectation that the CAP reforms in the 1990s, with its shift to direct area and headage payments, do not reduce the heterogeneous territorial incidence of agricultural support.

5. Summary and conclusions

The paper explores two issues relating to the effects of EU agricultural policy adjustments in the 1990s on support levels to producers. First, the focus is on the implications of reduced market price support and increased direct area and headage payments for gross transfer variability. Three commodities are covered in the analysis, that is, wheat, coarse grains and beef, as the central aspects of the reforms took place in these sectors. Besides, the impact on the aggregate level of support for all commodities is considered. The empirical evidence appears reasonable and suggests that the changes in policy instruments used by the CAP tend to stabilise gross transfers. The second issue investigated in this paper refers to the distributional impacts of CAP reforms during the 1990s. Findings for the German federal states show a heterogeneous territorial incidence of gross transfers per hectare. This is not surprising since farming structures differ substantially for the regions under study and support levels vary across commodities. In particular, higher levels of support per hectare seem to be associated with livestock density. As a result, north-western and southern federal states are the largest beneficiaries throughout the period under study. There is, however, some degree of mobility within the distribution over time. For example, federal states belonging to the former GDR regions received the lowest initial gross transfers per hectare, but due to shifts in the agricultural output mix they caught up and forged ahead of others. Nevertheless, the dispersion of this variable has increased, indicating that direct area and headage payments do not smooth the interregional disparities.

Finally, the limitations of this analysis must be stressed. As the paper reports *ex post* the intertemporal and interregional impacts of the changing CAP on gross transfers, the implications for farmers' revenue or income remain hidden. Besides, it offers little in the way of assessing the recent CAP reforms in 2003, with the introduction of a single payment scheme based on historical reference. To account for these issues is far beyond the scope of this article and would be interesting subjects for future research.

References

Aiello, F., 1999. The Stabilisation of LDCs' Export Earnings. The Impact of the EU STABEX Programme. In: International Review of Applied Economics 13 (1): 71-85.

Anders, S., J. Harsche, R. Herrmann and K. Salhofer, 2004. Regional Income Effects of Producer Support under the CAP. In: Cahiers d'Economie et Sociologie Rurales 73 (4): 103-122.

Andersson, F. C. A., 2004. Decoupling: The concept and past experience. SLI Working Paper 2004 1, Swedish Institute for Food and Agricultural Economics. Lund.

Arkleton Centre for Rural Development Research, 2003. The Territorial Impact of CAP and Rural Development Policy, ESPON project 2.1.3, Third Interim Report. Aberdeen.

Barro, R. J. and X. X. Sala-i-Martin, 1995. Economic Growth. McGraw-Hill International Editions.

Cahill, C. and W. Legg, 1989. Estimation of Agricultural Assistance Using Producer and Consumer Subsidy Equivalents: Theory and Practice. OECD Economic Studies 13: 13-43.

Cuddy, J. D. A. and P. A. Della Valle, 1978. Measuring the Instability of Time Series Data. In: Oxford Bulletin of Economics and Statistics 40 (1): 79-85.

Duggan, J. E., 1979. On Measuring the Instability of Time Series Data. In: Oxford Bulletin of Economics and Statistics 41 (3): 239-246.

Federal Statistical Office. Statistical Yearbook for the Federal Republic of Germany. Various issues. Wiesbaden.

Legg, W., 2003. Agricultural Subsidies: Measurement and Use in Policy Evaluation. Presidential Address. In: Journal of Agricultural Economics 54 (2): 175-201.

Maurseth, P. M., 2001. Convergence, Geography and Technology. In: Structural Change and Economic Dynamics 12 (3): 247-276.

OECD. Agricultural Policies in OECD Countries: Monitoring and Outlook. Various issues. Paris.

Sala-i-Martin, X. X., 1996. Regional Cohesion: Evidence and Theories of Regional Growth and Convergence. In: European Economic Review 40 (6): 1325-1352.

Tangermann, S., 2005. Is the Concept of the Producer Support Estimate in Need of Revision? In: OECD Food, Agriculture and Fisheries Working Papers 1.

Tarditi, S. and G. Zanias, 2001. Common Agricultural Policy. In: Hall, R., A. Smith and L. Tsoukalis (eds.), Competitiveness and Cohesion in EU Policies. Oxford: Oxford University Press, pp. 179-216.

Thompson, S., W. Gohout and R. Herrmann, 2000. Agricultural Market Liberalization and Instability of Domestic Agricultural Markets: The Case of the CAP. In: American Journal of Agricultural Economists 82 (3): 718-726.

Zanias, G., 2002. The Distribution of CAP Benefits among Member States and the Impact of a Partial Re-nationalisation: A Note. In: Journal of Agricultural Economics 53 (1): 108-112.

Zentrale Markt- und Preisberichtstelle. ZMP Marktbilanz, various issues. Bonn.

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46. Roland HERRMANN und Claudia RÖDER, Some Neglected Issues in Food Demand Analysis: Retail-Level Demand, Health Information and Product Quality. Oktober 1997, 27 Seiten.
(überarbeitete Fassung erschienen in „Australian Journal of Agricultural and Resource Economics“, Vol.42, No.4, 1998, S. 341-367)

47. Timothy JOSLING, The WTO, Agenda 2000 and the Next Steps in Agricultural Policy Reform. Mai 1998, 46 Seiten.

48. Kerstin PFAFF, Marktstruktur- und Preisasymmetrieanalyse der Fleischbranche in Mittelhessen. September 1998, 60 Seiten.

49. Kerstin PFAFF und Marc C. KRAMB, Veterinärhygiene- und Tierseuchenrecht: Bedeutender Standortnachteil für Erzeuger und Schlachthöfe in Hessen? Oktober 1998, 22 Seiten.

50. Axel REINHARDT, Determinanten der Investitionsaktivitäten der Ernährungsindustrie. Empirische Ergebnisse für die deutsche Fruchtsaftindustrie. Dezember 1998, 34 Seiten.

51. Roland HERRMANN, Claudia RÖDER und John M. CONNOR, How Market Structure Affects Food Product Proliferation: Theoretical Hypotheses and New Empirical Evidence for the U.S. and the German Food Industries. Februar 1999, 58 Seiten.

52. Roland HERRMANN und Richard SEXTON, Redistributive Implications of a Tariff-rate Quota Policy: How Market Structure and Conduct Matter. März 1999, 60 Seiten.
(ein Teil wurde in stark veränderter Form unter dem Titel "Market Conduct and Its Importance for Trade Policy Analysis: The European Banana Case" veröffentlicht in: MOSS, C., G. RAUSSER, A. SCHMITZ, T. TAYLOR und D. ZILBERMAN (eds.) (2001), Agricultural Globalization, Trade and the Environment. Dordrecht: Kluwer Academic Press, S. 153-177)

53. Stanley R. THOMPSON und Martin T. BOHL, International Wheat Price Transmission and CAP Reform. Juni 1999, 11 Seiten.

54. Michaela KUHL und P. Michael SCHMITZ, Macroeconomic Shocks and Trade Responsiveness in Argentina – A VAR Analysis. Juni 1999, 19 Seiten und Anhang.
(erschienen in "Konjunkturpolitik", Jg. 46, 2000, Heft 1/2, S. 62-92)

55. Roland HERRMANN, Johannes HARSCHE und Kerstin PFAFF, Wettbewerbsnachteile der Landwirtschaft durch unvollkommene Märkte und mangelnde Erwerbsalternativen? Juni 1999, 17 Seiten.
(etwas gekürzte Fassung erschienen in "Zeitschrift für Kulturtechnik und Landentwicklung", Heft 5/6, 1999, S.282-288)

56. Stanley R. THOMPSON und Wolfgang GOHOUT, CAP Reform, Wheat Instability and Producer Welfare. August 1999, 15 Seiten.

57. Silke SCHUMACHER, Nachwachsende Rohstoffe in Hessen: Analyse und Bewertung anhand des Fallbeispiels Raps. August 1999, 24 Seiten.

58. Ernst-August NUPPENAU, Nature Preservation as Public Good in a Community of Farmers and Non-Farm Residents: Applying a Political Economy Model to Decisions on Financial Contributions and Land Allocation. August 1999, 40 Seiten.
(wurde in veränderter Form unter dem Titel "Public Preferences, Statutory Regulations and Bargaining in Field Margin Provision for Ecological Main Structures" veröffentlicht in "Agricultural Economics Review", Vol. 1, No. 1, (2000), S. 19-32)

59. Stanley R. THOMPSON, Roland HERRMANN und Wolfgang GOHOUT, Agricultural Market Liberalization and Instability of Domestic Agricultural Markets: The Case of the CAP. März 2000, 18 Seiten.
(erschienen in "American Journal of Agricultural Economics", Vol. 82 (2000), No. 3, S. 718-726)

60. Roland HERRMANN, Marc KRAMB und Christina MÖNNICH, The Banana Dispute: Survey and Lessons. September 2000, 29 Seiten.
(gekürzte und stark veränderte Fassung erschienen in „Quarterly Journal of International Agriculture“, Vol. 42 (2003), No. 1, S. 21-47)

61. Roland HERRMANN, Stephanie KRISCHIK-BAUTZ und Stanley R. THOMPSON, BSE and Generic Promotion of Beef: An Analysis for 'Quality from Bavaria'. Oktober 2000, 18 Seiten.
(geänderte Fassung erschienen in „Agribusiness – An International Journal“, Vol. 18 (2002), No. 3, S. 369-385)

62. Andreas BÖCKER, Globalisierung, Kartelle in der Ernährungswirtschaft und die Möglichkeit der Neuen Industrieökonomie zur Feststellung von Kollusion. November 2000, 37 Seiten.

63. Kerstin PFAFF, Linkages Between Marketing Levels in the German Meat Sector: A Regional Price Transmission Approach with Marketing-Cost Information. Mai 2001, 17 Seiten.
(stark überarbeitete Fassung erschienen unter dem Titel „Processing Costs and Price Transmission in the Meat Marketing Chain: Analysis for a German Region“, in “Journal of International Food and Agribusiness Marketing”, Vol. 15 (2003), Nos. 1/2, S. 7-22 von Kerstin PFAFF, Sven ANDERS und Roland HERRMANN)

64. Roland HERRMANN, Anke MÖSER und Elke WERNER, Neue empirische Befunde zur Preissetzung und zum Verbraucherverhalten im Lebensmitteleinzelhandel. Mai 2001, 28 Seiten.
(stark veränderte Fassung erschienen in „Agrarwirtschaft“, Jg. 51 (2002), Heft 2, S. 99-111)

65. Stanley R. THOMPSON, Wolfgang GOHOUT und Roland HERRMANN, CAP Reforms in the 1990s and Their Price and Welfare Implications: The Case of Wheat. Dezember 2001, 14 Seiten.
(erschienen in “Journal of Agricultural Economics”, Vol. 53 (2002), No. 1, S. 1-13)

66. Andreas BÖCKER, Extending the Application of Experimental Methods in Economic Analysis of Food-Safety Issues: A Pilot Study on the Impact of Supply Side Characteristics on Consumer Response to a Food Scare. Juni 2002, 30 Seiten.
(veränderte Fassung erschienen unter dem Titel “Consumer response to a food safety incident: Exploring the role of supplier differentiation in an experimental study” in “European Review of Agricultural Economics”, Vol. 29 (2002), No. 1, p. 29-50)

67. Andreas BÖCKER, Perception of Food Hazards – Exploring the Interaction of Gender and Experience in an Experimental Study. Juni 2002, 24 Seiten.
(stark veränderte Fassung erschienen unter dem Titel “Geschlechterdifferenzen in der Risikowahrnehmung bei Lebensmitteln genauer betrachtet: Erfahrung macht den Unterschied” in “Hauswirtschaft und Wissenschaft“, Jg. 29 (2002), Heft 2, S. 65-75)

68. Roland HERRMANN und Anke MÖSER, Preisrigidität oder Preisvariabilität im Lebensmitteleinzelhandel? Theorie und Evidenz aus Scannerdaten. Juni 2002, 29 Seiten.
(erschienen in „Konjunkturpolitik“, Jg. 48 (2002), Heft 2, S. 199-227)

69. Sven ANDERS, Johannes HARSCHE und Roland HERRMANN, The Regional Incidence of European Agricultural Policy: Measurement Concept and Empirical Evidence. Oktober 2002, 18 Seiten.
(wesentlich überarbeitete Fassung erschienen unter dem Titel „Regional Income Effects of Producer Support under the CAP“ in „Cahiers d'Economie et Sociologie Rurales“, No. 73, 2004, S. 104-121 von Sven ANDERS, Johannes HARSCHE, Roland HERRMANN und Klaus SALHOFER)

70. Roland HERRMANN, Nahrungsmittelqualität aus der Sicht der Verbraucher und Implikationen für Pflanzenproduktion und Politik. Juni 2003, 16 Seiten.

71. Sven ANDERS, Agrarökonomische Analyse regionaler Versorgung. November 2003, 20 Seiten.
(erschienen in: T. MARAUHN und S. HESELHAUS (Hrsg.) (2004), „Staatliche Förderung für regionale Produkte“, Mohr Siebeck, Tübingen, S. 73-92)

72. Sabine KUBITZKI, Sven ANDERS und Heiko HANSEN, Branchenspezifische Besonderheiten im Innovationsverhalten des Ernährungsgewerbes: Eine empirische Analyse des Mannheimer Innovationspanels. Dezember 2003, 23 Seiten.
(erweiterte Fassung von S. KUBITZKI und S. ANDERS, erschienen in „Agrarwirtschaft (German Journal of Agricultural Economics)“, Jg. 54, Heft 2 (2005), S. 101-111)

73. Roland HERRMANN und Anke MÖSER, Psychological Prices of Branded Foods and Price Rigidity: Evidence from German Scanner Data. März 2004, 27 Seiten.
(stark veränderte Fassung zur Veröffentlichung angenommen in “Agribusiness – An International Journal”, Vol. 21 (2005))

74. Roland HERRMANN, Sven ANDERS und Stanley THOMPSON, Übermäßige Werbung und Marktsegmentierung durch staatliche Förderung der Regionalvermarktung: Eine theoretische Analyse. März 2004, 18 Seiten.
(erweiterte Fassung erschienen in „Agrarwirtschaft (German Journal of Agricultural Economics)“, Jg. 54, Heft 3 (2005), S. 171-181)

75. Andreas BÖCKER, Jochen HARTL, Christoph KLIEBISCH und Julia ENGELKEN, Extern segmentierte Laddering-Daten: Wann sind Segmentvergleiche zulässig und wann Unterschiede zwischen Segmenten signifikant? - Ein Vorschlag für einen Homogenitätstest. März 2005, 62 Seiten.

76. Sven ANDERS, Measuring Market Power in German Food Retailing: Regional Evidence. März 2005, 16 Seiten.

77. Heiko HANSEN und Johannes HARSCHE, Die Förderung landwirtschaftlicher Erzeugnisse durch die Europäische Agrarpolitik: Regionale Auswirkungen in Deutschland und Bestimmungsgründe. April 2005, 13 Seiten.
(erschienen in: Unternehmen im Agrarbereich vor neuen Herausforderungen, Schriften der Gesellschaft für Wirtschafts- und Sozialwissenschaften des Landbaues e. V., Band 41, 2006, S. 471-481)

78. Johannes HARSCHE, Die Bestimmungsgründe der Agrarförderung in Industrieländern und Schwellenländern. Mai 2005, 14 Seiten.

79. Jochen HARTL und Roland HERRMANN, The Role of Business Expectations for New Product Introductions: A Panel Analysis for the German Food Industry. Oktober 2005, 18 Seiten.
(etwas veränderte Fassung erschienen in “Journal of Food Distribution Research”, Vol. 37, No. 2 (2006))

80. Sven ANDERS, Johannes HARSCHE, Roland HERRMANN, Klaus SALHOFER und Ramona TEUBER, The Regional Allocation of EU Producer Support: How Natural Conditions and Farm Structure Matter. Januar 2006, 32 Seiten.
(überarbeitete Fassung erschienen unter dem Titel „The Interregional and Intertemporal Allocation of EU Producer Support: Magnitude and Determinants“ in “Jahrbuch für Regionalwissenschaft” – Review of Regional Research”, Vol. 27, No. 2 (2007), S. 171-193.)

81. Sven ANDERS, Stanley THOMPSON und Roland HERRMANN, Markets Segmented by Regional-Origin Labelling with Quality Control. Mai 2007, 27 Seiten.
(zur Veröffentlichung angenommen bei „Applied Economics“, (2007))

82. Heiko HANSEN und Yves SURRY, Die Schätzung verfahrensspezifischer Faktoreinsatzmengen für die Landwirtschaft in Deutschland. Juni 2007, 14 Seiten.
(erschienen in: Good Governance in der Agrar- und Ernährungswirtschaft, Schriften der Gesellschaft für Wirtschafts- und Sozialwissenschaften des Landbaues e. V., Band 42, 2007, S. 439-449)

83. Meike HENSELEIT, Sabine KUBITZKI, Daniel SCHÜTZ und Ramona TEUBER, Verbraucherpräferenzen für regionale Lebensmittel - Eine repräsentative Untersuchung der Einflussfaktoren -. Juni 2007, 26 Seiten.
(in veränderter Form erschienen in "Berichte über Landwirtschaft", Band 85, Heft 2, 2007, S. 214-237)

84. Sabine KUBITZKI und Wiebke SCHULZ, Das Nachfrageverhalten bei regionalen Spezialitäten: Das Beispiel Apfelwein in Hessen. Juli 2007, 21 Seiten.
(überarbeitete Fassung erschienen in "Jahrbuch der Absatz- und Verbrauchsforschung", Heft 2, 2007, S. 208-224)

85. Jochen HARTL, Anwendung der Meta-Analyse zur Identifizierung von Determinanten der Zahlungsbereitschaft für genetisch veränderte Lebensmittel. September 2007, 32 Seiten.

86. Heiko HANSEN, Temporal Instability and Redistributive Dynamics of Gross Transfers Arising from EU's Common Agricultural Policy. November 2007, 12 Seiten.