PRICE MODELS IN POULTRY MEAT VERTICAL*

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The aim of the submitted contribution is an analysis of price transmission in a poultry meat commodity vertical within the formulation of market equilibrium on the partial meat market. The key-stone is the construction of general single-equation autoregression models at all base levels of the commodity vertical, i.e. at the level of a producer, a processor as well as a consumer, and a subsequent standard estimate of specified models on the basis of econometric approach "general to specific", using the tools of econometric modelling and information criteria for the choice of significant delay length of explanatory variables. Models of price transmissions in the poultry meat vertical present themselves by different results and the specified forms show a different, more extensive structure against models of other kinds of meat. The structure of represented variables in the model corresponds to assumed links because the effect of both the feedforward and feedback was proved in the framework of the commodity of poultry meat and even in framework of cross relations to pig meat and beef.

autoregression model; commodity vertical; poultry meat; price transmission; significant delay

INTRODUCTION

To a certain extent, the poultry meat market is characteristic of specific features which do not exist in other types of meats and in their verticals. One of these explicatory aspects is different development of the ultimate consumption of a given type of meat. Poultry meat shows growing consumption in the long run as the only of the main kinds of meat (evaluated in the monitored period 1995–2005, Table 1) which is currently above-average in the Czech Republic in comparison with other EU states (measured by the consumption value per head of population per year).

Owing to the mentioned fact, the production of poultry meat also increased year-on-year and in the last years of the monitored period also the imports of poultry meat were up, including the meat semi-products and products with a substantial share of poultry meat. However, the mentioned significant increase in the imports invoked sale problems of many processors who blamed the Europe-wide bird flu incidence for the decrease in domestic demand. Nevertheless, in a longer period it is possible to trace up that the sale crisis was not caused by the consumers because in contrast to other European states they did not succumb significantly to the irresponsible and unnecessarily dramatizing information and the short-term significant decrease in consumption was subsequently reduced. However, through foreign trade this disease resulted in the aggravation of the position of Czech processors and producers because the imports of competitive goods at a considerably lower price of the imported slaughtered chickens increased intensively. A chain consequnece of this was the increase of the supplies in the Czech Republic because Czech producers could not compete with below-the-cost prices of subsidized, or clearly unprofitable import. This resulted in significant price swings which were a consequence of both the mentioned facts and the generally decreasing demand for poultry meat at the monitored period end. However, the sale problems in the form of substantially deteriorating production

Table 1. Basic characteristics

Poultry meat	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Number of chicken (th. pcs)	26 689	27 875	27 573	29 035	30 222	30 785	32 043	29 947	26 873	25 494	25 372
Opening stock (th. t)	5.8	8.5	7.0	5.0	8.0	15.0	14.0	14.4	6.4	7.7	7.7
Domestic production (th. t)	180	178.0	190.0	241.0	273.0	294.0	312.5	317.0	304.0	310.0	319.0
Import (th. t)	11.7	18.3	22.6	16.1	18.8	21.6	20.4	26.0	43.5	72.4	71.7
Total supply (th. t)	197.5	204.8	219.6	262.1	299.8	330.6	346.9	357.4	353.9	390.1	398.4
Domestic cinsumption (th. t)	178.8	187.2	206.5	246.0	278.5	307.0	320.0	335.0	329.0	349.5	352.7
Export (th. t)	10.2	10.6	8.1	8.1	6.3	9.6	12.5	16.0	17.2	32.9	39.7
Closing stock (th. t)	8.5	7.0	5.0	8.0	15.0	14.0	14.4	6.4	7.7	7.7	6.0

Source: CSO

* The data given in this paper resulted from the research project MSM 6046070906 "Economics of Resources of Czech Agriculture and their Efficient Use in Multifunctional Agri-food Systems".

economy negatively influenced even the other levels of the vertical despite the fact that the fall of the prices at the farmers' and consumers' level was not felt as seriously. In fact, the whole production vertical was affected and the sale problems had an impact on feed compound producers, of course, because after pig farmers the poultry farms are the second most important consumers of feed grains. The market situation has been improving at present and according to ex ante prediction of the Ministry of Agriculture (MZe, 2004) the poultry market is a prospective sector. The market aspects and the relations in the vertical described hereby are essential determinants in the process of market equlibrium formulation. However, the key factor for formulation of equlibrium processes is the evolution of pricing and price transmission across the vertical. The quantification of relations among particular price levels, the intensity and the direction of incidence of basic determinants and modelling of price sequence are the basic aim of the submitted paper. There is the only condition that in the following part poultry meat is generally abstracted from chicken meat which, nevertheless, represents a majority in poultry meat consumption.

MATERIAL AND METHODS

The basic objective of the paper will be realized by means of econometric modelling based on he approach "general to specific" (GS) stemming from a general dynamic model derived from the economic theory which is subsequently tested and specified in dependence on quantification of the realized tests. The result of application of various statistical tests of model data restriction is a specific model interpreted economically. This specific model in its character corresponds to a general model, however, it contains only substantial relations among the variables of the modelled relations (C a m p o s et al., 2005).

An unlimited dynamic (single-equation) model is usually formulated in the form of general ADL model (ADL = Autoregressive Distributed Lag) which, in its simplified form, without framing prognoses, is also used to meet the aims of this paper. A formal record of the simple auto-regression model with a delay results from general practice:

ADL y (n, p – k)

where: *y* – chosen endogenous variable
n – length of delay of the explanatory endogenous variable
p – number of exogenous variables involved
k – length of delay of exogenous variables

The ADL models should respect both the specification and the statistical presumptions of characteristics of a random component and explanatory variables of the modelled relation. From the view-point of specification presumptions the model always has to meet a criterion that a delimited specific model is not in contradiction with the general model. From the view-point of assumptions of characteristics of the random component the ADL model should meet four following needs so that the obtained estimates of model characteristics would be consistent, distortionless, and so that they would have asymptotically normal distribution (H ü b l e r , F r o h n , 2006).

i. $E(u_{t|yt-1}, \ldots, y_{t-n}, x_{1t}, x_{1t-1}, \ldots, x_{1t-p}, \ldots., x_{kt}, x_{kt-1}, \ldots, x_{kt-p}) = 0$;
ii. random variables $(y_t, x_{1t}, \ldots, x_{kt})$ are stationary and
iii. $(y_t, x_{1t}, \ldots, x_{kt})$ and $(y_{t-j}, x_{1t-j}, \ldots, x_{kt-j})$ are independent with sufficiently big "j";
iv. $(x_{1t}, \ldots, x_{kt})$ and "y_t" have non-zero and final first four moments;
v. absence of perfect multicollinearity.

In this paper, models are not used for prognostic purposes, therefore classical ADL models are not framed. In the framework of a relative simplification, simplified autoregression models are formulated here which have a character of ADL models but they are focused first on the question of time series stationarity and a choice of delay length of explanatory variables which is also the most important specification presumption with coincidental respect of statistical significance of the characteristics and of correlation characteristics of the model as a whole. Regarding the important presumption of time series stationarity serving as a database for the calculation of model data, the autocorrelation function (correlogram) is used in this paper to indentify stationarity and in the case of the existence of non-stationarity (which was confirmed with respect to the character of the database originating from a typically seasonal agriculture-food sector) the data are transformed in a suitable way in dependence on a resource of non-stationarity so that the resulting estimate of model characteristics would have the required characteristics, i.e. distortionless and consistent. For database transformation this paper uses the simplest way of seasonal differentiation corresponding with the length of seasonal character and further for the presence of a trend of suitable degree of interdifferentiation. The resulting estimate of simplified ADL models is built on transformed time series, namely with respect to the compliance of presumption of stationarity. In the decision making concerning the delay length it is necessary to stem from the general knowledge of the given vertical and from the knowledge of the nature and length of production processes. Further, from the viewpoint of practical application it is possible to make a decision in the ADL model on basis of comparison of the effects obtained from the involvement of a longer delay in the model (lost in the omission of the given delay) with the cost of such involvement (with a profit of the omission). The effect resulting from the involvement of other explanatory variables in the form of bigger delay of endogenous or exogenous variables is a better explanatory ability of the model. The choice of delay lenth in the ADL model can be made using the *F*-test or so called information criteria. This paper uses the *F*-test to determine the optimal lenth of delay. First, a big length of delay is considered (with high *n* and *p*). After the estimation of the general model of defined variables a common significance of regression coefficients of *n*-th and *p*-th delay is tested.

If the coefficients are inconclusive at the significance level of 5%, or 10%, this delay is excluded from the model and the estimation of the model is calculated with delay *n-1* and *p-1*. Another way of the choice of the delay length which was applied in this paper is the use of information criteria, or their optimization. From this point of view a criterium of maximization of corrected R^2 is used:

$$\overline{R}^2 = 1 - \frac{n-1}{n=q}\left(1 - R^2\right)$$

where: n – length of time series (observation)
q – number of data in the model

The information criterion of maximization of the corrected R^2 is based on the principle of growing number of explanatory variables in adding of another delay in the model; it means that R^2 will grow (or at least remain the same). Higher R^2 decreases a numerator value in the fraction. Thereby under the otherwise equal circumstances the corrected R^2 would grow. However, with the growth of the explanatory variables also the denominator in the formula fragment changes, i.e. the nominator decreases and also under the otherwise equal circumstances the corrected R^2 decreases. The resulting value of the corrected R^2 will depend on which of these two changes will prevail. In other words, if the R^2 accrue is higher than the decrease of freedom (n–q), the value of corrected R^2 will increase. It means that the increase of the explanatory ability of the model has to be higher than the cost of its obtaining in the form of the decrease in degrees of freedom (Č e c h u r a , 2009). Considering the sufficient length of time series of database obtained for the quantification of models it is not necessary to limit the delay length in view of the number of degree of freedom or multicolinearity.

Construction of price models

The process of market equilibrium formulation in the meat vertical using exclusive incidence of supply-demand relations is less usual regarding the specific character of the market and some regulation mechanisms are needed. Despite this fact, the assymetrical relation of supply and demand is a key process the result of which is especially the determination of equilibrium market price whereas both the mentioned variables are defined again through the price. The demand is under this condition a function of price in time "*t*", ceteris paribus, for which consumers are willing to buy the given commodity. The supply is also a function of price under the condition ceteris paribus, however, regarding specialities of agricultural-food market, or the meat market, it is a function of price in time "*t-n*" for which producers are willing to offer the given commodity.

$$D_t = fce(P_t) \quad S_t = fce(P_{(t-n)})$$

It results from the above that the basic factor for the determination of market equilibrium by the process of equalizing the demand with supply are prices of the given commodities which primarily influence the values (D_t) a (S_t). Of course, also many other factors enter the process, for example an expectation which is a cause of cyclical price fluctuations and other influences which are, indeed, abstracted further. Then, the resulting prices are determined by the interference of supply and demand at particular levels of the commodity vertical. They have a character of equilibrium prices at time "*t*" at the given vertical level. And just this price determination is the principle of the price transmission process which is the demanded object of modelling. The meat vertical was in the simplified model classified as three-level to which also three levels of theoretical equilibrium price correspond. At the level of basic industry the price of agricultural producers (*CZV*) is determined; at the level of processor the price of industry producers (*CPV*) is determined and at the level of consumer it is the consumer price (*SC*). The price of agricultural producers at time "*t*" is a result of the interaction between supply and demand, therefore:

$$CZV_t = fce(S_t \leftrightarrow D_t)$$

Regarding the fact that (S_t) is determined by price ($CVZ_{(t-n)}$) at the basic industry level (providing rational behaviour, i.e. profit maximization and perfect competition on the market) and the demand from the side of the processor (D_t) is given at the same assumptions by the income which again is a price function (CPV_t), then after the substitution (S_t) and (D_t) the basic function relation of price transmission at the farm price is obtained by the reduction:

$$CZV_t = fce(CZV_{(t-n)}, CPV_t)$$

Thanks to the transformation based on a similar principle, the definition of function dependence can be reached also for the processing and consumer levels:

$$CPV_t = fce\left(CPV_{(t-n)}, CZV_t\right)$$

$$SC_t = fce\left(SC_{(t-n)}, CPV_t\right)$$

Subsequently, on the basis of the defined theoretical economic model, by its further specification, a general form of econometric model of price transmission was derived. It has a character of simplified autoregression model with delay, generally of the ADL model. Function dependencies of particular single-equation models among endogenous and predetermined variables are given explicitly:

$$CZV_t = fce\left(CZV_{(t-n)}, CPV_t, CPV_{(t-n)}, CZVk_{(t-n)}, A\right)$$

$$CPV_t = fce\left(CPV_{(t-n)}, CZV_t, CZV_{(t-n)}, SC_t, SC_{(t-n)}, WMP_{(t-n)}, A\right)$$

$$SC_t = fce\left(SC_{(t-n)}, CPV_t, CPV_{(t-n)}, ISC_{(t-n)}, A\right)$$

Initial declaration of variables in the vertical:

CZV_t . . . . . Price of agricultural producers at time "t"
CZV_{t-n} . . . . . Price of agricultural producers at time "t–a"
CPV_t . . . . . Price of industrial producers at time "t"
CPV_{t-n} . . . . . Price of industrial producers at time "t–a"
SC_t. . . . . Consumer price at time "t"
SC_{t-n}. . . . . Consumer price at time "t–n"
$CZVk_{t-n}$ . . . . . Farmer price of feed at time "t–n"
WMP_{t-n} . . . . . Worls market price at time "t–n"
ISC_{t-n} . . . . . Consumer price index at time "t–n"
A . . . . . Base vector

From the viewpoint of delay in the models (i.e. of value "n") a principle "general to specific" is respected. First, a model with sufficiently big delay "n" is generated and subsequently unconvincing delays are excluded on the basis of the F-test for statistic significance of data and information criterion with the maintenance of sufficiently high corrected R^2. The proposed forms of general econometric models are the following:

$$CZV_t = \beta_0 + \beta_1 CZV_{(t-1)} + ... + \beta_{12} CZV_{(t-12)} + \gamma_{10} CPV_t + \gamma_{11} CPV_{(t-1)} + ... + \gamma_{112} CPV_{(t-12)} +$$
$$+ \gamma_{20} CZVpse_t + \gamma_{21} CZVpse_{(t-1)} + ... + \gamma_{212} CZVpse_{(t-12)} + u_t$$

$$CPV_t = \beta_0 + \beta_1 CPV_{(t-1)} + ... + \beta_{12} CPV_{(t-12)} + \gamma_{10} CZV_t + \gamma_{11} CZV_{(t-1)} + ... + \gamma_{112} CZV_{(t-12)} +$$
$$+ \gamma_{20} SC_t + \gamma_{21} SC_{(t-1)} + ... + \gamma_{212} SC_{(t-12)} + \gamma_{30} WMP_t + \gamma_{31} WMP_{(t-1)} + ... + \gamma_{312} WMP_{(t-12)} + u_t$$

$$SC_t = \beta_0 + \beta_1 SC_{(t-1)} + ... + \beta_{12} SC_{(t-12)} + \gamma_{10} CPV_t + \gamma_{11} CPV_{(t-1)} + ... + \gamma_{112} CPV_{(t-12)} +$$
$$+ \gamma_{20} ISC_t + \gamma_{21} ISC_{(t-1)} + ... + \gamma_{212} ISC_{(t-12)} + u_t$$

For the solution of the proposed models, a database is used in the form of time series with a monthly periodicity representing the period 1995 to 2005 (i.e. 132 observations). The data were obtained from the database ARAD ČNB, from the statistics of the Czech Statistical Office, the website FoodNET and in sporadic cases they were completed with the data from the Czech Meat Procesors Association and from the meat statistics of the Ministry of Agriculture (MZe). The data were analysed to identify the incidence of undesirable phenomena in the time series and to remove them, and subsequently they were treated with particular tools hereby described.

RESULTS AND DISCUSSION

Models of price transmission

CZV

In the model of price transmission in the poultry meat vertical at the basic industry level, a farmers' price of 1st class slaughter chicken of– CZVdI is chosen as the explained variable. On the basis of the above mentioned relations a general form of econometric model is framed. It is used for the identification of basic relations in the model and for the determination of dependence quality so that in further stages the model could be more specified. The proposed model has a form as follows:

ADL CZVdI (12, 6–12)

$$CZVdI_t = \beta_{10} + \beta_{11}CZVdI_{(t-1)} + ... + \beta_{112}CZVdI_{(t-12)} + \gamma_{10}CPVdk_t + \gamma_{11}CPVdk_{(t-1)} +$$
$$+ ... + \gamma_{112}CPVdk_{(t-12)} + \gamma_{20}SCdk_t + \gamma_{21}SCdk_{(t-1)} + ... + \gamma_{212}SCdk_{(t-12)} +$$
$$+ \gamma_{30}ICZVd_t + \gamma_{31}ICZVd_{(t-1)} + ... + \gamma_{312}ICZVd_{(t-12)} + \gamma_{40}CZVhA_t + \gamma_{41}CZVhA_{(t-1)} +$$
$$+ ... + \gamma_{412}CZVhA_{(t-12)} + \gamma_{50}CZVvI_t + \gamma_{51}CZVvI_{(t-1)} + ... + \gamma_{512}CZVvI_{(t-12)} +$$
$$+ \gamma_{60}CZVpse_t + \gamma_{61}CZVpse_{(t-1)} + ... + \gamma_{612}CZVpse_{(t-12)} + u_t$$

where: β_{10} – the absolute term
$\beta_{11} ... \beta_{1n}$ – estimated characteristics for "n" delay of endogenous variable
$\gamma_{10} ... \gamma_{1n}$ – estimated characteristics for "n" delay of predetermined variables
u_t – a random component
$iid\ (0, \delta^2)$

To save space an exact declaration of all variables for this and for other framed models is given in the end of this paper.

Relations in the proposed econometric model result from the following concept. The model contains 85 explanatory variables whereas the price of agricultural producer of 1st class (CZVdI) slaughter chicken is explained in the given period by its delayed values, the processing price of fully-dressed chicken (CPVdk), the consumer price of fully-dressed chicken (SCdk), the index of farmer poultry prices (ICZVd), the price of agricultural producer of slaughter bulls (CZVhA), the price of agricultural producer of slaughter pigs of the 1st class (CZVvI) and the farmers' price of feeding wheat (CZVpse). In all the mentioned variables the model includes their delay with the total length of 12 periods. Regarding the proposed model structure, some assumptions can be raised about the influence nature. Because it deals with poultry production which uses almost exclusively feed compounds based on cereals, a relatively strong influence of feeding wheat price is assumed. Further, with the knowledge of a close relation between pig and poultry meat in meat production a complementary relation of farmers' prices with positive price expectation is assumed. A significant influence is assumed also from the poultry processing price. Before the quantification process of the framed general model it is necessary to transform all databases in the form of time series to ensure a basic condition of time series stationarity. Methodological procedures of the transmission have been already described, therefore only the final course of the transformed variable CZVdl in the monitored period expurgated by seasonal and trend component is shown as an example below (Fig. 1).

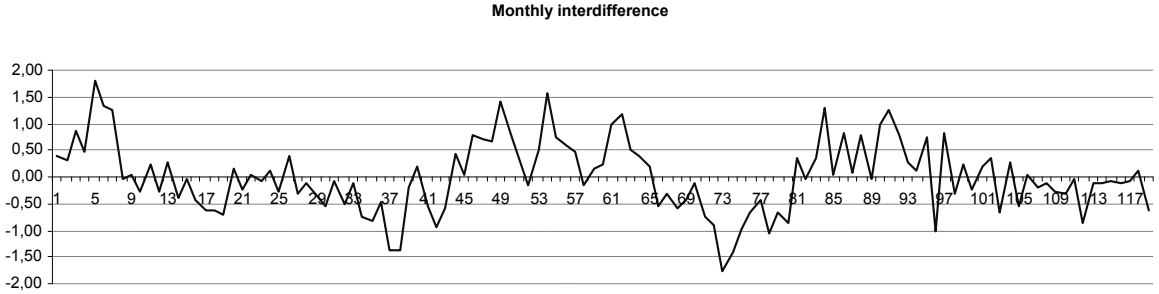

Fig. 1. Monthly interdifference CZV
Source: author's work

Results of estimation of the model ADL CZVdI (12, 6–12)

The result of the general model estimation is a quantification of the data of the explanatory variables with the involvement of all considered delays. The model quantified this way has to be understood as general from which, on the basis of the evaluation of estimation results, economic analysis and quantification of elimination delay tests after the imposition of zero restriction for insignificant delays, a specific model is generated. It includes only nine variables including the constants whose delays are statistically significant. The mentioned synthesis is carried out on several levels by gradual imposition of zero restrictions. Particular steps are founded on the analysis of statistical significance of particular data in cooperation with values of the *F-test* and coefficients of the corrected R^2, testing of regression residues using the *DW* value and testing of incidence of multicolinearity among variables using a correlation matrix. The estimation proper of the data as well as the quantification of statistical tests is carried out using the programme *Statistica 7.1.* Brief results are summarized in Table 2.

Table 2. Results of regression

Results of regression with dependent variable: CZVdI t (CZVd91.sta) R = 0.94837198 R^2 = 0.89940941 Corrected R^2 = 0.89119793 F(8.98) = 109.53 p < 0.0000 Standard error of estimation: 0.21062						
	Beta	St. er. beta	B	St. er. B	*t*(29)	Level p
Abs. term			–0.010149	0.020505	–0.49495	0.621741
CZVdI t-12	–0.123313	0.036556	–0.114344	0.033897	–3.37327	0.001065
CZVdI t-6	–0.083715	0.040430	–0.082285	0.039739	–2.07064	0.041021
CZVdI t-1	–0.393729	0.086996	–0.394936	0.087263	–4.52581	0.000017
CPVdk t-8	0.088324	0.036987	0.018891	0.007911	2.38799	0.018857
CPVdk t-6	0.106835	0.037536	0.023794	0.008360	2.84619	0.005389
ICZVd t-1	0.445754	0.082382	0.112582	0.020807	5.41084	0.000000
ICZVd t	0.844434	0.042131	0.212692	0.010612	20.04319	0.000000
CZVvI t-9	0.092482	0.037244	0.017666	0.007114	2.48315	0.014721

Source: author's work

Transcription of the model in an equation record.

$$CZVdI_t = -0.010 - 0.395\,CZVdI_{(t-1)} - 0.082\,CZVdI_{(t-6)} - 0.114\,CZVdI_{(t-12)} +$$
$$+\ 0.024\,CPVdk_{(t-6)} + 0.019\,CPV_{(t-8)} + 0.213\,ICZVd_t + 0.113\,ICZVd_{(t-1)} + 0.018\,CZVvI_{(t-9)}$$

The specified model met only some pronounced assumptions, especially the influence of the significance of some variables were not confirmed. The correlation characteristics of the model are at a very good level. From the correlation point of view the model has a relatively high determination coefficient $R^2 = 0.9$ and also the corrected $R^2 = 0.89$ has relatively high value. It can be considered as an expression of strong dependence. The *F*-test proved dependence of variables with a high rate of reliability. An important area for the model evaluation is the resulting structure in the sense of accepted variables. By specification the consumer price of fully-dressed chicken SCdk, the farmers' price of slaughter bulls CZVhA, and surprisingly also the farmers' price of feeding wheat CZVpse were eliminated from the model completely. For all three variables the reason was an insufficient evidence of their characteristics and results of delay significance tests. In the consumer price of chicken a possible explanation is too long relation to the farmers' price which a much closer variable – the processing price – enters. By elimination of the farmers' price of slaughter bulls a general assumption was confirmed that these two variables almost do not influence each other. The elimination of feeding wheat prices is against the pronounced hypothesis and has a leg only in the model characteristics. From the material-logical view-point the disqualification of feeding wheat price is hardly explicable, however, it could be supported by a higher representation of feed compounds than own cereals in broilers fattening. The monitored endogenous variable is influenced in the resulting form of the model by the following variables: the processing price of poultry (CPVdk), the price of slaughter pigs (CZVvI), the price index of agricultural poultry producers (ICZVd) and the delayed endogenous variable. As regards the intensity and direction of the incidence, the results can be characterized on the basis of derivation of total multiplicators of the effect "λ". The strongest positive effect was shown by the index of prices of agricultural poultry producers (λ = 0.2) and thereby also the expected presumption was met. The second strongest, again positive effect, belongs to the poultry processing price (λ = 0.02). Originally, a stronger effect was expected, however, the intensity of the effect in the proposed relation was not proved. On the contrary, the presumption of positive effect direction was met. The last exogenous variable, which has demonstrable slight positive effect on the endogenous variable, was the farmers' price of slaughter pigs. Thereby another original model hypothesis was met. In the evaluation of the significance of the given delay, there were big differences among variables, and the mentioned fact is a subject of other analysis in this work's conclusions.

CPV

For modelling the price transmission at the processing level, the price of industrial producer of fully-dressed chicken – CPVdk is chosen as an explained variable. From the view-point of development, a long-term slightly decreasing trend is evident. The price of industrial chicken producers in the monitored period copied in fact the price of agricultural producers, though with less variability. Mainly at the period´s end, the course of both prices is very similar. The reason is a situation introduced already at the beginning of 2004, above all thanks to the influence of cheap imports. On the basis of the mentioned relations and processes a general model of price transmission was derived at the level of industrial producer price which is characterized by the following function transcription.

ADL CPVdk (12, 5-12)

$$CPVdk_t = \beta_{10} + \beta_{11} CPVdk_{(t-1)} + ... + \beta_{112} CPVdk_{(t-12)} + \gamma_{10} CZVdI_t + \gamma_{11} CZVdI_{(t-1)} +$$
$$+ ... + \gamma_{112} CZVdI_{(t-12)} + \gamma_{20} CPVhzbk_t + \gamma_{21} CPVhzbk_{(t-1)} + ... + \gamma_{212} CPVhzbk_{(t-12)} +$$
$$+ \gamma_{30} CPVvkbkk_t + \gamma_{31} CPVvkbk_{(t-1)} + ... + \gamma_{312} CPVvkbk_{(t-12)} + \gamma_{40} SCdk_t + \gamma_{41} SCdk_{(t-1)} +$$
$$+ ... + \gamma_{412} SCdk_{(t-12)} + \gamma_{50} ICPVpv_t + \gamma_{51} ICPVpv_{(t-1)} + ... + \gamma_{512} ICPVpv_{(t-12)} + u_t$$

where: β_{10} – the absolute term
$\beta_{11} ... \beta_{1n}$ – estimated characteristics for "n" delays of an endogenous variable
$\gamma_{10} ... \gamma_{1n}$ – estimated characteristics for "n" delays of predetermined variables
u_t – a random component
$iid\ (0, \delta^2)$

The proposed form of the econometric model enables model selected relations between the chosen endogenous variable and declared explanatory variables. Concretely, the relation describes the incidence of the farmers´ price of slaughter chicken (CZVdI), the consumer price of fully-dressed chickens (SCdk), the processing price of pig rump off bone (CPVhzbk), the processing price of beef rump steak off bone (CPVvkbk), the processing prices' index of food products (ICPVpv) and their delayed values including the delayed endogenous variable on the explained variable. The most intensive effect is assumed from side of the farmers' poultry price and the consumer price. Thanks to the course of the values further a relatively strong positive effect in the index of processing prices of food products is assumed. Before a quantification process conceived a general model it is necessary again to transform the whole database in the form of time series to ensure a condition of stationarity of the time series. In Fig. 2 a final course of transformed explained variable CPVdk in the monitored period deprived of the seasonal and trend components is given.

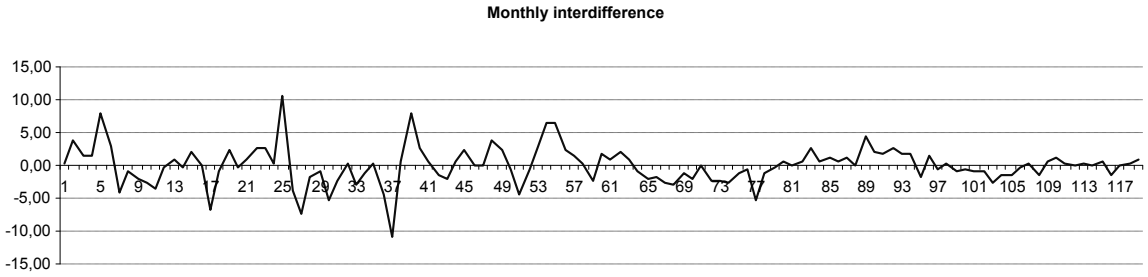

Fig. 2. Monthly interdifference CPV
Source: author's work

Results of estimation of the model ADL CPVdk (12, 5–12)

After the material-logical analysis of the economic relations and evaluation of econometric and statistical indicators of the model including tests of the choice of significant delays a specific form of the model was generated which is recorded in Table 3.

Resulting transcription of the model in the equation record:

$$CPVdk_t = 0.021 - 0.130\, CPVdk_{(t-2)} - 0.118\, CPVdk_{(t-5)} - 0.177\, CPVdk_{(t-8)} +$$
$$+ 0.171\, CPVdk_{(t-9)} - 0.110\, CPVdk_{(t-11)} - 0.160\, CPVdk_{(t-12)} - 0.065\, CPVvkbk_t -$$
$$- 0.188\, CPVhzbk_t + 0.177\, CPVhzbk_{(t-8)} - 0.188\, CPVhzbk_{(t-9)} + 0.787\, ICPVpv_{(t-6)} -$$
$$- 0.583\, ICPVpv_{(t-7)} + 1.137\, ICPVpv_{(t-10)} - 0.588\, ICPVpv_{(t-11)} + 0.773\, SC_t$$

The final form of specific model confirmed only some pronounced assumption of an influence on the explained variable. In the area of correlation characteristics of modelled relation it maintained acceptable results because the determination coefficient is $R^2 = 0.84$ and the corrected $R^2 = 0.82$. Also the F-test confirmed a sufficient level of significance. The most important area for price transmission analysis is the evaluation of representation of particular explanatory variables and their intensity and direction of incidence. In the introduced model the effect of delayed values of the price of industrial producer of fully-dressed chicken CPVdk, the consumer price of fully dressed chicken of the given period SCdk, the processing price of pig rump off bone CPVvkbk, delayed index of processing prices of food

Table 3. Results of regression

Regression results with dependent variable: CPVdk t (CPVd.sta) R = 0.91904046 R^2 = 0.84463537 Corrected R^2 = 0.81902581 F(15.91) = 32.981 p < 0.0000 Standard error of estimation: 1.1963						
	Beta	St. er. beta	B	St. er. B	*t*(29)	Level p
Abs. term			0.020772	0.116748	0.17792	0.859178
CPVdk t-12	–0.170913	0.057326	–0.159637	0.053544	–2.98143	0.003681
CPVdk t-11	–0.117727	0.051223	–0.109843	0.047793	–2.29831	0.023835
CPVdk t-9	0.181804	0.051021	0.171011	0.047992	3.56331	0.000585
CPVdk t-8	–0.188040	0.049510	–0.177134	0.046639	–3.79802	0.000263
CPVdk t-5	–0.118897	0.045625	–0.117663	0.045152	–2.60593	0.010704
CPVdk t-2	–0.130988	0.046778	–0.130173	0.046487	–2.80022	0.006236
SCdk t	0.890154	0.056010	0.773097	0.048645	15.89266	0.000000
CPVvkbk t	–0.097489	0.046874	–0.065431	0.031460	–2.07979	0.040357
ICPVpv t-11	–0.161901	0.061175	–0.588493	0.222365	–2.64652	0.009583
ICPVpv t-10	0.313347	0.067392	1.136541	0.244437	4.64962	0.000011
ICPVpv t-7	–0.162657	0.067437	–0.583116	0.241757	–2.41199	0.017873
ICPVpv t-6	0.219103	0.060897	0.787186	0.218788	3.59793	0.000521
CPVhzbk t-9	–0.162039	0.048972	–0.188157	0.056866	–3.30878	0.001343
CPVhzbk t-8	0.152550	0.048099	0.176700	0.055713	3.17162	0.002067
CPVhzbk t	–0.161485	0.046013	–0.188227	0.053633	–3.50956	0.000700

Source: author's work

products ICPVpv and also the effect of delayed and non-delayed processing price of beef rump steak CPVhzbkk were proved. On the contrary, the effect of farmers' price of slaughter chickens was not proved which is relatively surprising and also thereby the expressed assumption was not proved. The variable is excluded by the calculation procedure owing to statistically insignificant parameters as well as the fact that their involvement in the model did not bring improvement of the indicator of close dependence rate of the model. For an objective evaluation of intensity and direction of incidence total multiplicators "λ" are determined which enable to settle a summary effect on the endogenous variable in the involment of more delays with ambiguous orientation of a characteristics. In this context the variable ICPVpv reached $\lambda = 0.5$, so its effect can be evaluated as medium strong with a positive direction. The result confirmed the assumption of the model of an interrelated character of processing price of poultry meat and the general index of processing prices of food products. The variable CPVhzbk ($\lambda = -0.1$) works in the negative direction with a relatively low intensity which gives notice about a possible competitive relation between the price of beef and poutry meat at the processor's level. The effect of change CPVvkbk is also negative and in this respect similar conclusion hold as in the former variable. In the intensity of incidence, SCdk is the strongest variable in modelled relation and thereby one of the model assumptions was partially met. From the view-point of significance of particular delays the model shows hardly interpreted conclusions. From the result a relatively strong effect of delay of the own endogenous variable by 2 to 12 periods as well as a delay of the index of processing prices by 6 to 11 periods can be derived.

SC

At the consumer level in the model, the consumer price of fully-dressed chicken is chosen as an explained variable SCdk. Again, the consumer price of fully-dressed chickens has a very similar course as the foregoing processing price. Three aspects had a principial influence on the poultry meat market situation which reflects also the consumer price. One of the mentioned aspects is a continuing fall in the numbers of poultry, however, with an exception of fattening chickens which represents the only category in which a slight increase is recorded at the end of the monitored period. Another aspect are massive imports at the monitored period's end which is influenced above all by the Czech Republic's admission into the EU and by the adoption of EU customs legislation including the customs tariffs. The consequence were, for example, record imports of poultry meat in 2004 and this trend continued also in 2005. An interesting phenomenon in this connection is an approximate conformity of the import and export price per 1 kg. One the latter aspects is the development of natural consumption of poultry meat. It showed, as the only of main kind of meat, a long-term significant increase until 2003. Just the very favourable price relations were the reason for the rising tendency in comparison with other kinds of meat, a higher finalisation of poultry products, an easy treatment suitable for restaurant facilities and also a continuing rise of health education of dietological advantage of poultry meat. A certain break occurred in 2003 which indicated the end of the consumption growth. In the following years there was a slight increase,

however, not as significant. On the basis of some analyses (M a l ý , 2001) it is possible to presume that the poutry meat consumption has been approaching the saturation level in comparison with other kinds of meat. No other significant increase is assumed for the future. However, the situation can be influenced first of all by a price relation in respect of pig meat. Even in this situation economic principles and general correlations hold which could be used for modelling the price transmission on basis of which the general model characterized by the following function dependence was compiled.

ADL SCdk (12, 5-12)

$$SCdk_t = \beta_{10} + \beta_{11} SCdk_{(t-1)} + ... + \beta_{112} SCdk_{(t-12)} + \gamma_{10} CZVdI_t + \gamma_{11} CZVdI_{(t-1)} +$$
$$+ ... + \gamma_{112} CZVdI_{(t-12)} + \gamma_{20} CPVdk_t + \gamma_{21} CPVdk_{(t-1)} + ... + \gamma_{212} CPVdk_{(t-12)} +$$
$$+ \gamma_{30} SChzbk_t + \gamma_{31} SChzbk_{(t-1)} + ... + \gamma_{312} SChzbk_{(t-12)} + \gamma_{40} SCvkbk_t + \gamma_{41} SCvkbk_{(t-1)} +$$
$$+ ... + \gamma_{412} SCvkbk_{(t-12)} + \gamma_{50} ISCpv_t + \gamma_{51} ISCpv_{(t-1)} + ... + \gamma_{512} ISCpv_{(t-12)} + u_t$$

where: β_{10} – the absolute term
$\beta_{11} ... \beta_{1n}$ – estimated characteristics for "n" delays of an endogenous variable
$\gamma_{10} ... \gamma_{1n}$ – estimated characteristics for "n" delays of predetermined variables
u_t – a random component
$iid\ (0, \delta^2)$

The proposed form of econometric model enables to model relations between the chosen endogenous variable and declared explanatory variables. It deals with delayed values of consumer price of fully-dressed chicken SCdk, further with the consumer price of beef rump steak off bone SChzbk, the consumer price of pig rump off bone SCvkbk, the farmers´ price of slaughter chickens CZVdI, the processing price of fully-dressed chicken CPVdk, the consumer prices index of food products ISCpv, including the delayed variables of the total length 12 period. The conceived model stems from presumptions that the decisive power at this level is not the final consumer, who would determine a limit for price fluctuations, but that the processing price level has the majority influence. It is partly significantly influenced by a competitive relation to pig meat and partly it is dictated by the farmers´ price level which has a more significant influence transmitted on the consumer level on the mentioned market than it is on markets with other kinds of meat. Generally, a significant influence of all three consumer prices at various delays is assumed because the consumer price reacts first of all to movement of other commodities on the market in both the competitive and the complementary relations and of the processing price with medium-strong intensity of the effect and a positive direction. Before the quantification process of the general model, it is again necessary to transform the whole database in the form of time series to secure stationarity of time series. Fig. 3 shows a final course of the transformed explained variable SCdk in the monitored period deprived of seasonal and even of the trend component.

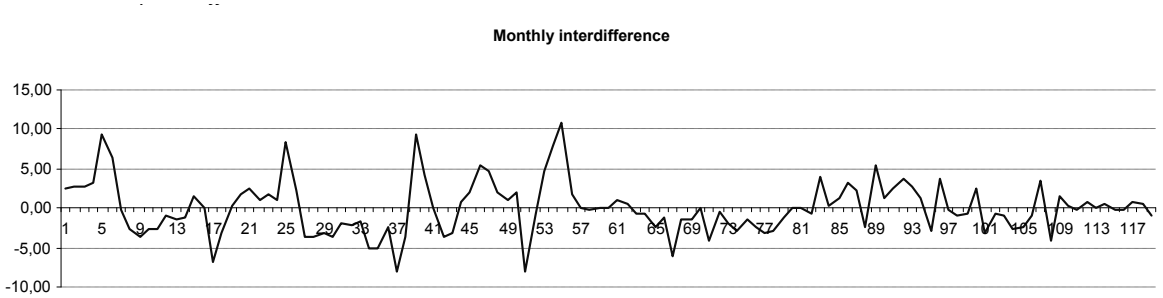

Fig. 3. Monthly interdifference SC
Source: author's work

Results of estimation of model ADL SCdk (12, 5–12)

Unfortunatelly, owing to an ambiguous identification of a suitable delay length the model specification is more difficult. Consequently a large amount of specification tests of delay length was made in concurrence with the analyses of economic link and evaluation of econometric characteristics. The result did not reach satisfactory conclusions, therefore they were rejected as 'blind'. In final consequence, a general specific model is generated which, after imposition of gradual zero restrictions, shows satisfactory values. Brief results are summarized in Table 4.

Transcription of the model in an equation record:

$$SCdk_t = 0.057 - 0.158\,SCdk_{(t-2)} - 0.185\,SCdk_{(t-4)} - 0.196\,SCdk_{(t-5)} + 0.367\,SCdk_{(t-6)} -$$
$$- 0.136\,SCdk_{(t-7)} - 0.426\,SCdk_{(t-9)} + 0.152\,SCvkbk_t - 0.168\,SCvkbk_{(t-1)} +$$
$$+ 0.219\,SCvkbk_{(t-2)} + 0.163\,SCvkbk_{(t-4)} - 0.529\,SCvkbk_{(t-5)} + 0.207\,SCvkbk_{(t-6)} +$$
$$+ 0.194\,SCvkbk_{(t-8)} - 0.255\,SCvkbk_{(t-9)} + 0.103\,SCvkbk_{(t-11)} + 0.224\,SChzbk_t -$$
$$- 0.367\,SChzbk_{(t-3)} + 0.304\,SChzbk_{(t-4)} + 0.459\,SChzbk_{(t-5)} - 0.379\,SChzbk_{(t-6)} -$$
$$- 0.279\,SChzbkk_{(t-7)} + 0.218\,SChzbk_{(t-9)} + 0.223\,SChzbk_{(t-10)} - 0.360\,SChzbk_{(t-11)} +$$
$$+ 0.234\,SChzbkk_{(t-12)} - 0.527\,ISCpv_t + 0.801\,ISCpv_{(t-1)} - 0.380\,ISCpv_{(t-2)} +$$
$$+ 0.676\,ISCpv_{(t-5)} + 0.567\,ISCpv_{(t-9)} + 0.705\,CPVdk_t + 0.282\,CPVdk_{(t-1)} +$$
$$+ 0.278\,CPVdk_{(t-2)} + 1.048\,CZVdI_{(t-1)} - 0.688\,CZVdI_{(t-2)} - 0.744\,CZVdI_{(t-7)} +$$
$$+ 0.807\,CZVdI_{(t-8)} + 1.200\,CZVdI_{(t-10)} - 1.522\,CZVdI_{(t-11)}$$

The final form of specific model is quite surprising, above all in the number of particular delayed variables in the model. Nevertheless, in the interest of compliance of comparable econometric procedures and objective indicators, the final form is generated by similar procedures. Again, it is necessary to focus on three relatively different areas in the model evaluation. From a view-point of correlation characteristics, a very slight decrease of statistics occurred in comparison with the general model. The determination coefficient decreased at the level $R^2 = 0.94$ and the corrected one at the level $R^2 = 0.91$. In comparison of these values with other models in the poultry meat vertical it deals with the highest reached values. sufficient result at an adequate significance level is achieved also in the *F*-test statistics. Another relevant area for an appropriate evaluation is the resulting model structure, in the sense of included variables. No variable is eliminated by specification of the model and 39 variables are tested as significant. Also on basis of the mentioned aspect it can be stated that it deals with suitably compiled structure of the general model. For the evaluation of incidence intensity and direction, again the total multiplicators "λ" are used which enable to better characterize the effect of more delays of one variable. In this way the strongest influence is shown by the processing price of poultry meat CPVdk (λ = 0.76) which, according to presumptions, works in the positive direction. This fact confirms a hypothesis of the general model which predicted a very significant effect in this variable. Also a significant positive effect is identified in the consumer price index ISCpv (λ = 0.68). Other variables show a positive direction of incidence on the chosen endogenous variable, but already with a slight or very low intensity. The variable SChzbk achieved λ = 0.19, for SCvkbk the value is λ = 0.08 and for CZVdI then λ = 0.09. Regarding the pronounced presumptions, mainly the fact of representation of significant variables was proved. However, an assumed significant effect of the farmers' price was not confirmed. Probably it is too far from the consumer level and its determination is transferred in the processing price. Imposition of zero restrictions on statistically inconclusive delays caused a disarranged and hardly interpretable involvement of various length of delay. Nevertheless, generally a difference can be found out against the foregoing models in the sense of involved total delay lengths because an unexpectedly long length of significant delays appeared at this level of poultry meat price (Table 5).

CONCLUSIONS

Models of price transmissions in the poultry meat vertical present themselves by different results and the specified forms show a different, more extensive structure against models of other kinds of meat (M a l ý , 2006). At the farmers' level the price of slaughter chickens is conclusively influenced first of all by its delayed values but also the effect of consequential delayed processing price of fully-dressed chicken, the delayed farmers´ price of slaughter pigs shows itself, and in values of total multiplicator the most strongly effecting predetermined variable – the price index of agricultural poultry producers. The representation of the index of farmers' poultry price is in the intensity of the incidence a surprising phenomenon thereby the assumption about processing price as the strongest variable was not proved. At the processing level, the price of industrial producer of fully-dressed chickens is again very intensively influenced by its delayed values and of independent variables then in a positive direction by the consumer price of fully-dressed chickens and the index of processing poultry prices. Further, the processing price of both the pig meat and beef enters the simulated relation, whereas both show a negative direction of incidence with a low intensity. The structure of represented variables in the model corresponds to assumed links because the effect of both the feedforward and feedback was proved in the framework of the commodity of poultry meat and even in framework of cross relations to pig meat and beef. In the evaluation of the significance of particular delays, there is an obvious difference among the variables which show statistically significant effect in various delay lengths. Also an interesting phenomenon is the conclusive effect of undelayed values in both processing prices of competitive kinds of meat and the consumer price of poultry

Table 4. Results of regression

Regression results with dependent variable: SCdk t (SCd.sta) R = 0.97189294 R^2 = 0.94457589 Corrected R^2 = 0.91231409 F(39.67) = 29.278 p < 0.0000 Standard error of estimation: 0.95882						
	Beta	St. er. beta	B	St. er. B	*t*(29)	Level p
Abs. term			0.057133	0.095131	0.60058	0.550147
SCdk t-9	–0.457355	0.060426	–0.426125	0.056300	–7.56882	0.000000
SCdk t-7	–0.139911	0.056181	–0.135661	0.054474	–2.49039	0.015246
SCdk t-6	0.371951	0.052449	0.367274	0.051790	7.09165	0.000000
SCdk t-5	–0.198574	0.053878	–0.196035	0.053189	–3.68564	0.000458
SCdk t-4	–0.186909	0.051058	–0.185001	0.050537	–3.66071	0.000497
SCdk t-2	–0.157677	0.072626	–0.157292	0.072449	–2.17107	0.033472
CZVdI t-11	–0.323237	0.050180	–1.521848	0.236253	–6.44160	0.000000
CZVdI t-10	0.254946	0.053325	1.200499	0.251098	4.78099	0.000010
CZVdI t-8	0.170003	0.062451	0.807574	0.296662	2.72221	0.008258
CZVdI t-7	–0.152465	0.055560	–0.744644	0.271358	–2.74414	0.007778
CZVdI t-2	–0.135261	0.051633	–0.687608	0.262482	–2.61964	0.010878
CZVdI t-1	0.206096	0.066381	1.048327	0.337655	3.10473	0.002790
CPVdk t-2	0.243232	0.073808	0.278317	0.084454	3.29549	0.001573
CPVdk t-1	0.244875	0.047812	0.282087	0.055078	5.12160	0.000003
CPVdk t	0.611898	0.047942	0.704547	0.055201	12.76334	0.000000
SChzbk t-12	0.162546	0.051167	0.233540	0.073514	3.17679	0.002252
SChzbk t-11	–0.251607	0.059829	–0.359805	0.085557	–4.20544	0.000079
SChzbk t-10	0.155968	0.047645	0.222984	0.068117	3.27352	0.001682
SChzbk t-9	0.152455	0.057090	0.217952	0.081617	2.67042	0.009498
SChzbk t-7	–0.196553	0.044431	–0.279441	0.063168	–4.42376	0.000037
SChzbk t-6	–0.266861	0.057113	–0.379240	0.081163	–4.67255	0.000015
SChzbk t-5	0.323813	0.053813	0.458639	0.076219	6.01742	0.000000
SChzbk t-4	0.213796	0.045995	0.304357	0.065478	4.64823	0.000016
SChzbk t-3	–0.258771	0.041274	–0.367477	0.058613	–6.26951	0.000000
SChzbk t	0.159627	0.044938	0.224797	0.063285	3.55217	0.000705
SCvkbk t-11	0.121344	0.049498	0.102898	0.041974	2.45147	0.016841
SCvkbk t-9	–0.300060	0.069669	–0.254776	0.059155	–4.30691	0.000055
SCvkbk t-8	0.228421	0.043175	0.193736	0.036619	5.29061	0.000001
SCvkbk t-6	0.245462	0.049481	0.207469	0.041822	4.96076	0.000005
SCvkbk t-5	–0.625619	0.068375	–0.529018	0.057817	–9.14989	0.000000
SCvkbk t-4	0.192609	0.056084	0.162782	0.047399	3.43431	0.001024
SCvkbk t-2	0.260891	0.056081	0.218784	0.047030	4.65206	0.000016
SCvkbk t-1	–0.199816	0.051582	–0.167670	0.043283	–3.87378	0.000246
SCvkbk t	0.181156	0.054857	0.151908	0.046000	3.30236	0.001540
ISCpv t-9	0.208386	0.060920	0.567162	0.165806	3.42063	0.001068
ISCpv t-5	0.247354	0.056225	0.676382	0.153745	4.39938	0.000040
ISCpv t-2	–0.138643	0.061342	–0.380187	0.168213	–2.26015	0.027067
ISCpv t-1	0.291942	0.067405	0.800502	0.184823	4.33117	0.000051
ISCpv t	–0.192680	0.060169	–0.527057	0.164586	–3.20232	0.002087

Source: author's work

meat. The model of consumer price level of poultry meat is the most extensive model of all models and regarding the structure of significant variables it is hardly interpretable. The explained variable of the model is substantially influenced by own delayed values and of many other variables the most strongly working variable is the processing price of poultry meat oriented in a positive direction. The second most intensive effect was shown by the price index of food products, also in a positive direction. Further the model contains all originally proposed variables of a general form because no component was eliminated by the specification and a statistically significant effect of all variables with various delay lengths was verified. Therefore, the consumer price of poultry meat is influenced with

Table 5. Declaration of variables

Variable	Content	Currency/weights
CZVpse	CZV Feeding wheat	CZK/t (CZK/kg)
CZVhA	CVZ Slaughter bulls Class A in meat	CZK/t (CZK/kg)
CZVvI	CVCZ Slaughter pigs I. in meat	CZK/t (CZK/kg)
CZVdI	CVZ Slaughter chickens I.	CZK/t (CZK/kg)
CPVvkbk	CPV Pig rump off bone	CZK/kg
CPVvplbk	CPV Pig shoulder off bone	CZK/kg
CPVhpbk	CPV Beef front meat off bone	CZK/kg
CPVhzbk	CPV Beef rump meat off bone	CZK/kg
CPVdk	CPV Chicken fully-dressed	CZK/kg
SCvkbk	SC Pig rump off bone	CZK/kg
SCvplbk	SC Pig shoulder off bone	CZK/kg
SChpbk	SC Beef front meat off bone	CZK/kg
SChzbk	SC Beef rump meat off bone	CZK/kg
SCdk	SC Chicken fully-dressed	CZK/kg
ICZV	Index CZV total agricultural product (CZV = agr. production prices)	ČNB* Average 1999 = 100
ICZVZV	Index CZV AP (AP = animal production)	ČNB Average 1999 = 100
ICZVh	Index CZV CATTLE	ČNB Average 1999 = 100
ICZVv	Index CZV PIGS	ČNB Average 1999 = 100
ICZVd	Index CZV POULTRY	ČNB Average 1999 = 100
ICPVpv	Index CPV food products	ČNB Average 1999 = 100
ISCpv	Index SC (SC = consumer price) food products	ČNB 12/1999 = 100
porazkad	Total purchase of slaughter poultry	tons of live weight
PODCZVij	Share of farmers' price of i-th and j-th commodity	
PODCZVik	Share of farmers' price of i-th and k-th commodity	
PODCPZ	Share of industrial and farmers' price of i-th commodity	
PODSCij	Share of consumer price of i-th and j-th commodity	
PODSCik	Share of consumer price of i-th and k-th commodity	
A	Unit vector	
t	Time vector	
t2	Time quadrate	
"H" / "h"	Beef identification	
"V" / "v"	Pig meat identification	
"D" / "d"	Poultry meat identification	

* ČNB = Czech National Bank

a slight intensity and in a positive direction besides the above mentioned also by the consumer price of pig meat and beef, and also very slightly by the farmers' price of slaughter chickens. The evaluation of the length of significant delays is sporadic in the model and it can lead to misleading conclusions. Briefly it can be stated that an effect of a wide range of delayed periods was proved almost in all variables and in some cases also the effect of almost the whole proposed delay length. Other conclusions are structured in the interest of better clarity in simple statements:

i. The price of agricultural producer is conclusively influenced by its delayed values, the index of farmers' poultry prices and the farmers' price of slaughter pigs.

ii. On the processing level, the explained processing price of poultry meat is conclusively influenced by its delayed values and the consumer price of poultry meat. The strongest effect of positive direction is shown by the index of industrial producers of meat from forced slaughter. Also competitive relations to the processing price of pig meat and beef show themselves in the model which works in the inverse direction.

iii. The consumer price of poultry meat is significantly influenced by many variables. The strongest and positive effect was proved from the side of the processing price of poultry meat and the consumer price index of food products. Other conclusive effect of substantially lower intensity but also a positive direction showed the consumer price of beef and pig meat and the farmers' price of slaughter chickens.

iv. In comparison on the farmers' level it is obvious that a substantial effect has historical development of basic industrial prices and the consequential processing price of the given commodity.
v. In farmers' prices of poultry meat a link to the farmers' price of slaughter pigs showed itself from which a relative all-roundness of pig meat can be assumed.
vi. At the processing level, significant determinants are always the own delayed values of explained variables and consequential consumer prices.
vii. Mutual intercommodity influences on the processing degree show themselves by mixed incidence. The price of beef is influenced by the pig meat price which is affected by the poultry meat price. On the contrary, the price of poultry meat is influenced by both remaining kinds of meat.
viii. On the consumer level, the dedayed values and the consumer price index of food products work conclusively.
ix. The consumer price of poultry meat is influenced by the highest number of variables. The effect of both the processing price level and the consumer price of both remaining kinds of meat shows itself here.

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Received for publication on February 12, 2009
Accepted for publication on March 26, 2009

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Cenové modely ve vertikále drůbežího masa.

Scientia Agric. Bohem., *40*, 2009: 73–85.

Cílem předloženého příspěvku je analýza cenové transmise v komoditní vertikále drůbežího masa při vytváření tržní rovnováhy na dílčím trhu s masem. Základním principem je konstrukce obecných jednorovnicových autoregresních modelů na všech základních úrovních komoditní vertikály, tj. na úrovni výrobce, zpracovatele i spotřebitele, a následný odhad parametrů specifikovaných modelů na základě ekonometrického přístupu „general to specific", s využitím nástrojů ekonometrického modelování a informačních kritérií pro volbu signifikantní délky zpoždění vysvětlujících proměnných. Koncipovaný odhad je následně podroben věcně logickému, ekonomickému a statistickému rozboru pro určení významných determinantů v rámci cenových relací napříč danou komoditní vertikálou.

autoregresní model; komoditní vertikála; drůbeží maso; cenová transmise; signifikantní zpoždění

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