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POLITICAL RENTS OF EUROPEAN FARMERS IN DIFFERENT AGRARIAN STRUCTURES OF THE UE: INPUT-OUTPUT ANALYSIS FOR SELECTED EU-27 COUNTRIES

Bazyli Czyżewski✉, Anna Matuszczak, Michał Borychowski

Uniwersytet Ekonomiczny w Poznaniu

Abstract. It is generally believed that agricultural interventionism under the European Union's Common Agricultural Policy represents the payment of political rents to farmers. The authors attempt to show that the concept of political rent known as the rent-seeking theory is not valid for agricultural policy. It is not justified to identify the whole of the subsidies paid to agriculture in the EU as a "political rent", since political rents cannot be taken to include payments for the supply of public goods or those transfers which compensate for market imperfections. A methodology is proposed for valuing these items, filling a gap existing in the literature on political economy. The authors perform comparative analyses with the aim of calculating the "pure political rent", based on input-output matrices for representative farms according to the EUFADN typology and on a decomposition of the Hicks-Moorsteen TFP index for the period 2007–2012 and all EU-27 countries. The research hypothesis is proposed that the size of the subsidies retained in agriculture is a function of the political cycle, but also of market imperfections.

Keywords: political rents, agriculture, input-output analysis, rent-seeking, CAP

INTRODUCTION

Agricultural subsidies under the EU's Common Agricultural Policy are commonly believed to be political rents disbursed to the farmers. However, when thoroughly analyzed, the rent-seeking (public choice) theory (in the aspect of public-good valuation) as well as the achievements of institutional economics in studying the relationship between market failure and government failure seem to contradict the above assertion. According to the above theories, agricultural and rural subsidies are justified by at least two important reasons which shift the cognitive perspective.

The problem is about the compensation for market failure related to public goods delivered by the agriculture and to information asymmetry in the agri-business. As regards the first issue, the evolution of the CAP shows there is increasing social support for a concept where some agricultural subsidies are regarded as a fee for the delivery of public goods produced in rural areas. As regards the second issue, in view of the duration of the production cycle, the farms may take only an adaptive approach to price and (income) expectations.

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✉dr hab. B. Czyżewski, prof. nadzw. UEP, Zespół Badawczy Katedry Makroekonomii i Gospodarki Żywnościowej, Uniwersytet Ekonomiczny w Poznaniu, Al. Niepodległości 10, 61-875 Poznań, Poland, e-mail: b.czyzewski@ue.poznan.pl

In turn, the food industry players and the producers of means of agricultural manufacturing may formulate their expectations on rational grounds.

The authors believe that, as a consequence of the aforesaid information asymmetry, the "outflow of the economic surplus" from the agriculture sector through price movements can be objectively measured. However, this issue is not addressed by economic theory (Czyżewski and Brelik, 2014). If it is possible to calculate the part of the economic rent flowing out of the agriculture sector due to the aforesaid market failure, it becomes obvious that the re-transfer of the rent fails to meet the criteria provided for in the definition of the "economic rent." Similarly, funds disbursed as a part of the RDP (for instance) are not a political rent if they represent a remuneration for specific public goods delivered by the farmers. **Therefore, the total amount of agricultural subsidies should cover the outflow of the surplus through price movements and the fee for public goods. Any excess beyond that amount is undoubtedly a "net political rent."**

The purpose of this paper is to verify the above concept of measuring the political rent in farms representative of various agrarian structures in the EU. To do so, the authors used the identified agrarian structures in the EU grouped by land management patterns[1] (Matuszczak, 2013). Afterwards, the value of surplus outflow, public goods and net political rent was calculated for farms representative of each cluster. Two research hypotheses are formulated by the authors:

1) the amount of subsidies depends not only on political lobbying but also (if not mostly) on the market failure in respect to public goods and information asymmetry,
2) although the agricultural prices are shaped on a global basis, they affect the flow of the agri-business surplus and the value of political rents to various degrees, depending on the agrarian structure. As a consequence, the same price conditions may lead to an unexpected outflow of the economic surplus (economic rent) from the agriculture sector in one country while resulting in an equally unexpected inflow in another one. Thus, the share of net political rent in the farms' P&L account also depends on the agrarian structure of the country concerned.

POLITICAL RENT VS. MARKET FAILURE

A concept developed by M. Olson and pioneered by G. Tullock, the political rent is a core component of the rent-seeking theory. The rent is a part of incomes which exceeds the expenditure necessary to maintain the current use of the resources (i.e. exceeds the opportunity cost thereof). If, in a democratic society, the interests of small groups of people are reflected in actions taken by public authorities who provide these groups with exclusive benefits (rents), this represents a political rent (Wilkin, 2012). In summary, the source of political rent is a political activity taken in order to obtain benefits in the form of budgetary transfers. This means a rent obtained by employing resources in non-productive activities. Therefore, the question arises whether, and to what extent, this kind of rent exists in the agriculture, having in mind the broad scope of state interventionism in that sector.

Previous attempts to analyze the political rents were focused on estimating the losses in prosperity; assessing the inefficiency of resources used in order to obtain the rent; evaluating the transaction costs of the institutions involved; or assessing the political contracting mechanisms (e.g. the works by R. Posner) (Myerson, 1997). Authors of the relevant literature agree that the market mechanism fails to ensure the (Pareto) optimum supply of public goods (Atkinson and Stiglitz, 1980). This conclusion is underpinned by various findings, including the Lindhal's model showing the theoretical existence of a quasi-market mechanism which leads to the identification of a socially optimal level of a public good together with fiscal prices that suit individual preferences (Mueller, 2003). However, the equilibrium-seeking process assumes that individuals reveal their true demand for public goods. The authors believe that the CAP could serve as an example of attempts to discover that demand. As a provider of public goods, the agriculture sector (which therefore demonstrates a lower net consumption level) pays a smaller net amount of taxes

[1] To group the regions into clusters by agrarian structures, the following features were analyzed: the number of farms, the average farm size in ESU, the average farm area in ha, and the average area of: leased agricultural land in ha, fallow land, set-aside land and forests. Also, the profitability of the resource considered (in EUR) was analyzed, i.e. net added value per ha of agricultural land, added value per ESU, family farm income per ha of agricultural land, family farm income per ESU. The holdings covered by this study (average farms in the region) were arranged in a hierarchical order and divided into four classes.

(Starrett, 1988). This is why some part of subsidies cannot be regarded as a political rent, including without limitation those conditioned upon delivery of a specific public utility by the farmers. **The authors assume the following to be a payment for public goods: abandonment premiums, agri-environmental subsidies, support for LFA farming and other payments under the RDP.** The selection of payments for public goods is a subjective process, partially based on the definition of common goods (primarily those whose supply may be directly linked to equivalent CAP payments). Obviously, the range of public goods defined as having favorable public impact is much broader and is delivered by a larger group of farms. What is problematic is the quantification and valuation of such goods. A widely adopted method is the institutional valuation of public goods (by subsidizing a specific activity which creates a public good, or by compensating for the discontinuation of activities harmful to common goods). This was the reason for selecting the CAP programs referred to above (note that this selection is subjective by nature).

The above reasoning shows a clear similarity to the well-known O. Williamson's hypothesis that the development of the hierarchy of structures (e.g. horizontal integration) is based on efficiency criteria rather than on monopoly rent seeking (Williamson, 1998). The same is true in this case: state interventionism in the agriculture may derive from market failure or from the increasing demand for public goods rather than from the pursuit of special interests by small groups of people.

The existence of public goods and the information asymmetry are considered to be the key market failures. While it requires no proof that rural areas and the agriculture sector deliver specific public goods, a justification must be provided for the assertion that the outflow of the economic surplus, due to unexpected variations in prices of agricultural goods, is a market failure.

The example below is based on data for Poland, as shown in Table 3. As already mentioned, price expectations in the agricultural sector, especially in small family farms, are of adaptive nature. This means that in 2011, following the harvest, the farm adapts its price expectations based on output prices and prices of productive inputs in 2011, as per the following equation:

$$p_t^e = p_{t-1}^e + (p_{t-1} - p_{t-1}^e), \text{ with } \lambda \in (0,1) \qquad (1)$$

p_t^e – expected prices in period t;
p_{t-1}^e – expected prices in period t–1;
p_{t-1} – prices in period t–1;
λ – parameter.

Having in mind the above price pattern, the farm realizes that it may optimize the production mix and improve its production performance. For instance, a "small" Polish farm increased its technological efficiency by EUR 583.59 (in 2012 vs. 2011). With the 2011 price patterns and adaptive expectations, this is exactly what could have been expected by the farmer. The production decisions were made in 2011 against a background of uncertainty as to the next year's prices. The production outcomes will be known only in the next season when the farmer will no longer control the current supply (for instance, because the crops will be already growing). Unfortunately, from the expected EUR 583.59 an amount of EUR 638.36 was transferred to other agribusiness sectors due to adverse price movements which, however, could not be foreseen in 2011, when planning the production mix (the cobweb model). Thus, it may be estimated that the outflow of surplus from "small" farms through price movements was 9.1% of 2012 incomes. Nevertheless, the fact itself that the productivity surplus flows out from the agriculture sector through price movements in the year concerned is not a market failure, if temporary in nature. As the expectations of the agriculture sector are adaptive, in 2012, the farmer will once more attempt to optimize his production mix, considering the patterns of output prices and material prices. This is rational behavior implied by market conditions. But what if, in the next year, the improved performance (this time, in another production area) is once again offset by adverse price movements? The farmer will reconsider his expectations once more. But will this continue forever? How long can this situation persist? According to neoclassical reasoning, the market should seek the optimum allocation of resources. This means, the subsequent attempts to optimize the production mix should result in a corresponding increase of the surplus (incomes) in a long term perspective. Otherwise, the farmer should go out of business and move to another industry. **Our thesis is that if the surplus does not increase (pro rata to performance growth) on a long-term basis, it confirms the existence of a market failure.** The authors believe this to be caused by the asymmetry of information in the agri-business. For the farmer, the only option is to adapt his expectations when making production decisions, whereas the buyers

of agricultural primary products may make their decisions already knowing the harvest forecasts. Therefore, they foresee the prices in the next season in a rational way. Moreover, in the case of a high concentration of manufacturing industry, the buyers may dictate the prices, being aware of abundant harvests. This is why the prices in the agriculture sector are usually flexible (due to inelastic demand) and tend to decrease more than proportionally to the increase in demand necessary to sell the production surplus. From a long-term perspective, this is an unusual situation which does not occur in most of the economy activities covered by the market system (the agriculture is an exception). Such an "unequal treatment" by the market mechanism restricts the farmers' ability to compete with other operators, which could be regarded as a market failure.

In summary, the calculation of the net political rent boils down to answering two questions: what portion of the agricultural economic surplus flew out due to market failure, and what was the value of public goods delivered by the agriculture sector? Then, the authors deduct the value of the outflow and of public goods from the total subsidies disbursed to a representative farm in the year concerned. This paper is based on results from one year (the most recent year covered by FADN data available during the study). We realize this is inconsistent with the above interpretation of market failure which should be diagnosed over a long period. Note however that this a new method, and therefore this study is of a pilot nature. Also, because the intended purpose is to verify the second hypothesis rather than to estimate the political rents, a statistical analysis is a sufficient procedure.

METHODOLOGY FOR THE IDENTIFICATION OF SIMILAR AGRARIAN STRUCTURES AND POLITICAL RENTS MEASUREMENT

To identify the typical agrarian structures in the EU, a cluster analysis was carried out for 27 member countries, based on a representative sample of FADN farms at regional level. After collinearity was eliminated, the following variables were taken into account: economic size (ESU); area of agricultural land (UR); area of land set aside; area of meadows, forests and fallow land; net added value; income per ESU and per ha. This allowed to identify four different classes of agrarian structures (based on the Ward's method, cf. Table 1). The separation of clusters was verified with the Silhouette coefficient recommended by Gatnar and Walesiak (Gatnar and Walesiak, 2004). The 1st class of clusters was composed of French, Belgian, British, Danish and Finnish regions. Polish, Lithuanian, Hungarian, Irish, Bulgarian and Romanian regions formed the 2nd class; Austrian, Latvian, Estonian, Slovenian and several Italian regions formed the 3rd class; the 4th class was composed of Slovakian, German and Swedish regions. Afterwards, one country was selected from each cluster for a comparative analysis of political rents.

As regards valuation of political rents, the proposed method is based on Hicks-Moorsteen Total Factor Productivity indices (HM TFP indices) integrated with I/O matrices for the agricultural sector.

The HM TFP Index was transformed as follows:

$$\Delta TFP = \left(\sum_{i=1}^{n} Q_{it} \cdot P_{it-1} - \sum_{i=1}^{n} Q_{it-1} \cdot P_{it-1} \right) - \left(\sum_{i=1}^{n} F_{jt} \cdot R_{jt-1} - \sum_{i=1}^{n} F_{jt-1} \cdot R_{jt-1} \right) \quad (3)$$

with:

Q_i – quantity of product i in subsequent years (t–1, t),

F_j – quantity of external input j in subsequent years (t–1, t),

P_i – prices of product i in subsequent years (t–1, t),

R_j – prices of external input j in subsequent years (t–1, t),

ΔTFP – change in total factor productivity in monetary units, resulting from the change of the actual value of outputs and inputs (without subsidies).

The I/O matrix included the following variables in accordance with the FADN classification:

Variable type	FADN codes of variables
Outputs	SE140, SE146, SE145, SE150, SE155, SE160, SE165, SE170, SE175, SE180, SE185, SE190, SE195, SE200, SE216, SE220, SE225, SE230, SE235, SE240, SE245, SE251, SE256, SE 395
Inputs	SE285, SE295, SE300, SE305, SE310, SE320, SE330, SE331, SE340, SE345, SE350, SE356, SE360, SE370, SE375, SE380, SE390, SE408
Subsidies	SE611, SE612, SE613, SE616, SE617, SE618, SE619, SE621, SE622, SE623, SE625, SE626, SE631, SE632, SE640, SE650, SE699, SE406, SE407

Table 1. Grouping variables for Ward classes characterizing the use of the land factor on an average farm in the EU regions (2012)
Tabela 1. Zmienne grupujące oraz ich wielkości przeciętne w analizie skupień struktur agrarnych w przeciętnych gospodarstwach rolnych FADN dla regionów UE (2012)

Variables – Zmienne	Cluster 1 Skupienie 1	Cluster 2 Skupienie 2	Cluster 3 Skupienie 3	Cluster 4 Skupienie 4
Economic size in ESU Wielkość ekonomiczna w ESU (SE005)	76.67	21.60	20.10	339.36
Surface area of the used UAA (ha) Powierzchnia UR (ha) (SE025)	80.54	25.39	43.79	358.92
Surface area of leased UAA (ha) Powierzchnia dodzierżawianych UE (ha) (SE030)	53.90	11.65	23.07	306.41
Set-aside land areas (ha) – Odłogi (ha) (SE072)	0.56	1.02	3.86	2.67
Fallow land areas (ha) – Ugory (ha) (SE073)	2.61	0.67	0.35	13.06
Forests (ha) – Lasy (ha) (SE075)	1.19	0.60	11.28	2.38
WDN/NAV/1 ESU (415/SE005)	738.8	1 120.6	1 257	498
WDNNAV/1 ha UAA (se415/SE025)	703.2	885.9	577	470.1
Income from a family farm for 1 ha Dochód z gospodarstwa rodzinnego na 1 ha (SE420/SE025)	397.6	721.4	454.8	57.9
Income from a family farm/1 ESU Dochód z gospodarstwa rodzinnego (SE420/SE005)	417.7	912.5	990.9	61.2

Source: own research based on FADN data.
Źródło: badania własne na podstawie FADN.

Afterwards, the change in the value of the agriculture sector's economic rent (surplus), resulting solely from the changing prices of products sold and external productive inputs purchased (including taxes), was calculated as follows:

$$\Delta A_{\mathrm{St}} = \left[\sum_{i=1}^{n}\left(\frac{Q_{it}\cdot P_{it}}{HICP} - Q_{it}\cdot P_{it-1}\right)\right] - \left[\sum_{j=1}^{m}\left(\frac{F_{jt}\cdot P_{jt}}{HICP} - F_{jt}\cdot R_{jt-1}\right)\right] \quad (4)$$

HICP – inflation rate,

ΔA_{St} – change in the sector's economic rents in period t compared to t–1 (outflow/inflow of the economic surplus through price movements)
Other symbols are the same as in equation 3).

The following is assumed, in accordance with the reasoning provided in item 2:

ΔTFP = expected change in incomes

$\Delta TFP + \Delta A_s$ = actual change in incomes (in real terms)

The political rent in a specific period will be calculated as follows:

$$\text{if } \Delta A_{St} < 0 \; PR_t = \sum_{i=1}^{n} S_{it} - \sum_{i=1}^{n} VPG_{it} + \Delta A_{St} \quad (5)$$

$$\text{if } \Delta A_{St} \geq 0 \; PR_t = \sum_{i=1}^{n} S_{it} - \sum_{i=1}^{n} VPG_{it} \quad (5a)$$

with:

PR_t – political rent in period t

S_i – agricultural subsidies under the CAP

VPG_{it} – value of public goods delivered by a representative farm, based on the institutional valuation under the CAP (subsidies)

Other symbols are the same as in equations (3) and (4).

Several variables were estimated in accordance with the above methodology, including ΔTFP, ΔA_{st} and PR_t for representative farms in various economic size (standard output) classes in France, Poland, Austria and Slovakia in 2012 compared to previous year based on FADN data. These countries represent four classes of agrarian structures identified in the abovementioned cluster analysis (cf. footnote 2). The economic size criterion is based on standard output (SO) which means the production value corresponding to an average condition of each type of agricultural activity in the region concerned. In accordance with the FADN methodology, the following nomenclature is adopted based on the SO: from EUR 2,000 to EUR 8,000: "very small" farms; above EUR 8,000 and up to EUR 25,000: "small" farms; above EUR 25,000 and up to EUR 50,000: "medium-small" farms; above EUR 50,000 and up to EUR 100,000: "medium-large" farms; above EUR 100,000 and up to EUR 500,000: "large" farms; above EUR 500,000: "very large" farms. Sector price indices and HICPs used in the calculations originate from Eurostat databases.

RESULTS

Political rent in cluster 1, as illustrated by the example of France

In France, according to the study of a representative FADN farm, in 2012, there was a decline in the Total Factor Productivity (TFP) compared to 2011 in some SO classes (III to VI, cf. Table 2). This means there was a decrease in the actual productivity in all farm classes under consideration, mainly due to declining production volumes. These developments occurred in a period where the total value of subsidies was relatively stable. Thus, the subsidies did not affect, even indirectly (e.g. through an induced increase of investments in productive assets), the levels of productivity. **Note that in accordance with equations 3–2, when calculating the total productivity and rent flows, subsidies were not taken into consideration either.** However, there was a considerable increase in incomes of "medium-small" (III) and "medium large" (IV) family farms (cf. the actual change in incomes as the total of the "TFP surplus" and the "outflow/inflow of the surplus through price movements," Table 2). In other words, the decline in the actual productivity levels was fully offset by the inflow of economic surplus through price movements. For instance, the technological (actual) performance of a "medium-large" farm was reduced by EUR 828.35, and therefore this could be the expected decline in incomes based upon price levels in 2011. However, due to favorable price movements (narrowing price scissors: the prices of goods sold by the producers grew faster than those of goods purchased), as much as EUR 3,100.17 was transferred as an economic rent to this class of farms from other agri-business sectors. Based on the above, it may be estimated that in these farms the inflow of the surplus (economic rent) through price movements represented 10.8% of 2012 incomes. This is not applicable to the largest farms (VI) where the income dropped as only two thirds of the productivity (TFP) loss were offset by the inflow of the economic rent through price movements. Nevertheless, even in this case, there was an inflow of as much as EUR 29,901.45 (22.7% of incomes) from other agri-business sectors. This is a comfortable situation for agricultural producers as their incomes keep growing despite the declining productivity (TFP). Does it mean the expectations of French farms are more reasonable than assumed in this paper? And is the cobweb model becoming a thing of the past?

The reasons may include, first of all, a gradual move away from the capital-intensive production intensification (which is a kind of technology treadmill) towards more extensive and sustainable methods. Secondly, this could be explained by the probably high degree of (vertical and horizontal) contractual integration which stabilizes the prices by distributing the production risk and reducing information asymmetry. Although the direct reason for these developments is the economic upturn in the EU agricultural market in 2012, it was not equally beneficial to farms from other clusters, as demonstrated later in this paper.

Table 2. Drainage of surplus, CAP payments for public goods and political rent for a representative farm in France in 2012 (relative to 2011)
Tabela 2. Drenaż nadwyżki, opłata za dobra publiczne z WPR i renta polityczna w gospodarstwie reprezentatywnym we Francji w 2012 roku (względem 2011 r.)

SO classes – Klasy SO	III	IV	V	VI
Income from family farm (incl. subsidies) (EUR) Dochód z rodzinnego gosp. rolnego (z subsydiami) (euro)	16 674	28 683	64 979	131 948
Total subsidies (EUR) – Suma subsydiów (euro)	18 744	24 723	39 754	48 784
Surplus TFPa[1], *t*-1 =100, i.e. expected change in income (EUR) Nadwyżka TFP[1], *t*-1 =100, tj. oczekiwana zmiana dochodu (euro)	–508.96	–828.35	–4 118.29	–45 852.68
Drainage/inflow of economic surplus through prices, *t*-1 =100 (EUR) Drenaż/napływ nadwyżki ekonomicznej przez ceny, *t*-1=100 (euro)	2 290.75	3 100.17	4 218.31	29 901.45
Actual change in income[2] – Faktyczna zmiana dochodu[2]	1 781.8	2271.8	100.0	–15 951.2
Surplus drainage/inflow relative to income (%) (outflow "–", inflow "+") Drenaż/napływ nadwyżki względem dochodu (%) (odpływ „–", dopływ „+")	13.7%	10.8%	6.5%	22.7%
Subsidies relative to income (incl. subsidies) (%) Udział subsydiów[3] w dochodzie (z subsydiami) (%)	112.4%	86.2%	61.2%	37.0%
Revenue (EUR) Przychody (euro)	77 372	13 4675	312 525	869 924
Subsidies relative to revenue (incl. subsidies) (%) Udział subsydiów w przychodzie (z subsydiami) (%)	24.2%	18.4%	12.7%	5.6%
Payment for public goods (EUR) Opłata za dobra publiczne (euro)	3745	3706	2566	1043
Payment for public goods relative to total subsidies (%) Udział opłaty za dobra publiczne w subsydiach ogółem (%)	20.0%	15.0%	6.5%	2.1%
Payment for public goods relative to income (%) Udział opłaty za dobra publiczne w dochodzie (%)	22.5%	12.9%	3.9%	0.8%
Political rent (EUR) – Renta polityczna (euro)	14 999	21 017	37 188	47 741
Political rent relative to income (%) Udział renty politycznej w dochodzie (%)	90.0%	73.3%	57.2%	36.2%
Political rent relative to total subsidies (%) Udział renty politycznej w subsydiach ogółem (%)	80.0%	85.0%	93.5%	97.9%
The sum of rents (economic and political) (EUR) Suma rent (ekonomiczna i polityczna) (euro)	17 289.75	24 117.17	41 406.31	77 642.45
The sum of rents (economic and political) relative to income (%) Udział sumy rent (ekonomicznej i politycznej) w dochodzie (%)	103.7%	84.1%	63.7%	58.8%

[1] Total Factor Productivity.
[2] The sum of the value of the TFP surplus and its drainage is equal to the actual growth/fall in a family farm's agricultural income in 2012 relative to 2011.
[3] It is assumed that payments for public goods include set-aside and agri-environmental payments, support for less favoured areas, and other subsidies under rural development programmes.
Source: own elaboration based on EU FADN data.
[1] Łączna produktywność czynników wytwórczych.
[2] Suma wartości nadwyżki TFP i jej drenażu równa się faktycznemu wzrostowi/spadkowi dochodu z gospodarstwa rodzinnego w rolnictwie w 2012 względem 2011 r.
[3] Przyjęto, że charakter opłaty za dobra publiczne mają dopłaty za odłogowanie, rolnośrodowiskowe, ONW i pozostałe PROW.
Źródło: opracowanie własne na podstawie danych FADN.

What also seems interesting is the share of subsidies in incomes which is steadily decreasing as the farm size grows, ranging from over 100% in a very small individual farm to less than 40% in the largest one. Meanwhile, the share of "payments for public goods" (abandonment premiums, agri-environmental subsidies, support for LFA farming and other payments under the RDP) in total subsidies reaches the highest levels (20%) in the smallest farms and the lowest levels (2.1%) in "very large" ones. Their share in incomes follows a similar pattern, with 22.5% in "medium-small" farms and 0.8% in "very large" ones.

When it comes to assessing the share of "net political rent" in total incomes and subsidies (cf. Table 2), **it represents as much as 90% of the incomes of "medium-small" sized farms and over one third of the incomes of the largest operators. In turn, the share of the net rent in total subsidies ranges from 80% to around 100%. This means the CAP subsidies do more than rewarding the delivery of public goods and compensating for the possible outflow of the surplus through price movements: they also support the incomes as a net political rent** (reaching a share as high as 90% in the case of the smallest farms). The question is whether, and to what extent, this can be justified by other aspects, e.g. higher income disparities than in other sectors. However, as mentioned before, these trends need to be verified over a longer period to draw any final conclusions.

Political rent in cluster 2, as illustrated by the example of Poland

Unlike in cluster 1, it turns out that farms representative of specific SO classes in cluster 2 (as illustrated by the example of Poland) demonstrated varying levels of TFP surplus in 2012 compared to 2011. In classes I to IV, it was positive or close to zero, whereas a negative value was reported in class VI (cf. Table 3). This means that in all farm classes, except for the largest ones, there was a growth (or stabilization) in actual productivity due to technological and/or organizational innovations. It should be clearly noted that the actual value of total subsidies remained virtually unchanged over the years concerned, and thus did not affect, even indirectly, the levels of productivity. Nevertheless, an increase in family farm incomes was experienced only in the largest classes (V and VI). This is an interesting development, especially in the case of "very large" farms where, despite a decline in actual productivity, there was an increase in incomes owing to the inflow of surplus through price movements, just like in the case of French farms. This pattern was not observed in other classes. Farms grouped in classes II, III and IV improved their technical performance and therefore could expect an increase in incomes. Unfortunately, a portion of the actual productivity growth flew out to other agri-business sectors due to unfavorable price movements. Based on the above, it could be estimated that the outflow of surplus through price movements in "very small" and "medium-large" farms was 10.33% and 4.2% of incomes, respectively.

Thus, Table 3 data abundantly shows the essence of the "technological treadmill" in the agriculture (based on the cobweb model). **As mentioned earlier, 2012 witnessed a decrease in prices of some agricultural primary products (including, without limitation, potatoes, sugar beet, protein fruits and plants; as well and milk and milk products, to a small extent). Most of the farms responded by a significant increase of TFP (while the subsidies remained at a stable level). However, the outcomes were more than offset by the outflow resulting from price movements.** It is hard to determine the causal relationship: did the farms improve their performance in response to decreasing prices of agricultural primary products? Or did the prices of agricultural primary products fall due to a massive increase of productivity related to the previous year's expectations (formulated under specific conditions which included record levels of potato prices)? But one thing is for sure: the interdependency of these processes drives the "technological treadmill" because of which the industrial development model of the agriculture is doomed to fail over a long period.

The trends identified in Table 3, if confirmed to be of a long-term nature, are also interesting for two other reasons:

- the share of total subsidies in incomes is steadily decreasing as the farm size grows: starting from 82.3% in "very small" individual farms, it reaches approximately 40% in "large" ones; however, it climbs back to nearly 80% in "very large" farms. Is it therefore justified to conclude that the "largest" farms behave differently by following the path of the EU-15 large farms? While reducing their productivity, they maintain an increase in incomes, mainly because of the inflow caused by favorable price movements and large amounts of subsidies;

Table 3. Drainage of surplus, CAP payments for public goods and political rent for a representative farm in Poland in 2012 (relative to 2011)
Tabela 3. Drenaż nadwyżki, opłata za dobra publiczne z WPR i renta polityczna w gospodarstwie reprezentatywnym w Polsce w 2012 roku (względem 2011 r.)

SO classes – Klasy SO	I	II	III	IV	V	VI
Income from family farm (incl. subsidies) (EUR) Dochód z rodzinnego gosp. rolnego (z subsydiami) (euro)	3 039	6 989	18 291	35 287	81 949	229 188
Total subsidies (EUR) Suma subsydiów (euro)	2 501	4 388	8 616	14 813	32 440	180 524
Surplus TFPa[1], *t*-1 = 100, i.e. expected change in income (EUR) Nadwyżka TFP[1], *t*-1 = 100, tj. oczekiwana zmiana dochodu (euro)	–70.92	583.59	603.41	1 324.01	4 715.17	–3 724.34
Drainage/inflow of economic surplus through prices, *t*-1 = 100 (EUR) Drenaż/napływ nadwyżki ekonomicznej przez ceny, *t*-1 = 100 (euro)	–314.06	–638.36	–1 172.72	–1 482.58	–398.59	19 500.87
Actual change in income[2] Faktyczna zmiana dochodu[2]	–384.99	–54.8	–569.3	–158.6	4 316.6	15 776.5
Surplus drainage/inflow relative to income (%) (outflow "–", inflow "+") Drenaż/napływ nadwyżki względem dochodu (%) (odpływ „–", dopływ „+")	–10.33	–9.1	–6.4	–4.2	–0.5	8.5
Udział subsydiów[3] w dochodzie (z subsydiami) (%) Subsidies relative[3] to income (incl. subsidies) (%)	82.3	62.8	47.1	42.0	39.6	78.8
Revenue (EUR) Przychody (euro)	10 739	21 991	53 647	106 974	291 603	1 732 283
Subsidies relative to revenue (incl. subsidies) (%) Udział subsydiów w przychodzie (z subsydiami) (%)	23.3	20.0	16.1	13.8	11.1	10.4
Payment for public goods (EUR) Opłata za dobra publiczne (euro)	482	871	1 367	2 049	3 764	10 046
Payment for public goods relative to total subsidies (%) Udział opłaty za dobra publiczne w subsydiach ogółem (%)	19.3	19.8	15.9	13.8	11.6	5.6
Payment for public goods relative to income (%) Udział opłaty za dobra publiczne w dochodzie (%)	15.9	12.5	7.5	5.8	4.6	4.4
Political rent (EUR) Renta polityczna (euro)	1 705	2 879	6 076	11 281	28 277	170 478
Political rent relative to income (%) Udział renty politycznej w dochodzie (%)	56.1	41.2	33.2	32.0	34.5	74.4
Political rent relative to total subsidies (%) Udział renty politycznej w subsydiach ogółem (%)	68.2	65.6	70.5	76.2	87.2	94.4
The sum of rents (economic and political) (EUR) Suma rent (ekonomiczna i polityczna) (euro)	1 704.94	2 878.64	6 076.28	11 281.42	28 277.41	189 978.9
The sum of rents (economic and political) relative to income (%) Udział sumy rent (ekonomicznej i politycznej) w dochodzie (%)	56.1	41.2	33.2	32.0	34.5	82.9

[1] Total Factor Productivity.
[2] The sum of the value of the TFP surplus and its drainage is equal to the actual growth/fall in a family farm's agricultural income in 2012 relative to 2011.
[3] It is assumed that payments for public goods include set-aside and agri-environmental payments, support for less favoured areas, and other subsidies under rural development programmes.
Source: own elaboration based on FADN data.
[1] Łączna produktywność czynników wytwórczych.
[2] Suma wartości nadwyżki TFP i jej drenażu równa się faktycznemu wzrostowi/spadkowi dochodu z gospodarstwa rodzinnego w rolnictwie w 2012 względem 2011 r.
[3] Przyjęto założenie, że charakter opłaty za dobra publiczne mają dopłaty za odłogowanie, rolnośrodowiskowe, ONW i pozostałe PROW.
Źródło: opracowanie własne na podstawie danych FADN.

- meanwhile, the share of "payments for public goods" (abandonment premiums, agri-environmental subsidies, support for LFA farming and other payments under the RDP) in total subsidies reaches the highest levels in the smallest farms and the lowest levels in very large ones.

When it comes to assessing the share of "net political rent" in total incomes and subsides, it represents as much as 74.4% of the incomes of "very large" sized farms and 56.1% in "small" farms, reaching lower levels in other SO classes. This means the CAP subsidies more than offset the outflow of surplus to the market (except for class VI) and the delivery of public goods, **whereas the share of net political rent in total subsidies ranges from 68.62% to 94.4%.** The conclusions regarding the CAP, which should be the subject of a separate review, would certainly be controversial. However, the trends contemplated above should be verified over a long period, having in mind the pilot nature of this analysis.

Political rent in cluster 3, as illustrated by the example of Austria

The next step was the analysis of an average representative farm in Austria. In 2012, in the analyzed SO classes (II, III, IV, V), the surplus of Total Factor Productivity was negative vis-à-vis the 2011 level (cf. Table 4). This means there was a decrease of actual productivity in all farm classes, just like in France. However, the family farm income dropped in all SO classes (cf. the actual change in incomes as the total of the "TFP surplus" and the "outflow/inflow of the surplus through price movements," Table 4), albeit not to the extent implied by the decline in productivity, as it was offset by favorable price movements (narrowing the price scissors), just as in French farms.

The largest share (around 10%) of the "inflowing" surplus from other economic activities was reported by "small" (II) and "large" (V) farms. Just like in the case of French farms, this could indicate a move away from production intensification patterns towards sustainable methods of agricultural manufacturing. **This is especially likely to happen in Austria because the share of public good payments in the subsidies is one of the highest in the EU, reaching a level of around 50% (or just under in the largest farms).** This is not surprising as countries of this cluster (including Austria) demonstrate the highest afforestation rates (cf. Table 1) and the highest implementation rates of agri-cultural programs. Note also that the largest share of subsides in incomes was reported by the smallest farms. Interestingly, in their case, the subsidies exceeded the incomes by one third, while representing around one half of incomes in the largest farms.

When it comes to assessing the share of "net political rent" in total incomes, it represents as much as 61.5% of the incomes of small-sized farms and 28.9% of the incomes of the largest ones. The share of net rent in total subsidies is 61% and 45%, respectively (cf. Table 4). Note that from the social prosperity perspective, these results are significantly better than those recorded in the two previous clusters (the losses of prosperity tend to decrease and the allocative efficiency tends to grow as the value of net political rents declines). **This indicates a desirable course of development of the European agriculture model (if the results are confirmed over a long period).**

Political rent in cluster 4, as illustrated by the example of Slovakia

The economic situation of Slovakian farms considerably differs from that of Western European farms, and even from that of Polish farms. Just like in East German Länder and other regions of this cluster, Slovakian farms demonstrate largest average sizes and highest economic power in the EU (Matuszczak, 2013). Usually, these are agricultural holdings that have more in common with enterprises than with family farms. **However, in European terms, this kind of agrarian structure turns out to be definitely unsuccessful and generates the greatest losses in social prosperity.** Note that the agricultural sector in this cluster subsists only because of the CAP and related support mechanisms. As shown by this study, in 2012, farms representative of specific SO classes in Slovakia demonstrated varying TFP growth rates compared to 2011. In classes III, V and VI, the growth was negative, whereas a positive value was reported in class IV (cf. Table 5). This means that all farm classes except for "medium-large" ones experienced a decline in actual productivity levels. Nevertheless, an increase in family farm incomes was experienced only in class III and VI (with a decline in class IV and V). Only the "medium-large" farms increased their productivity (by EUR 11,682.9), expecting the same growth in their incomes. However, as the market

Table 4. Drainage of surplus, CAP payments for public goods and political rent for a representative farm in Austria in 2012 (relative to 2011)
Tabela 4. Drenaż nadwyżki, opłata za dobra publiczne z WPR i renta polityczna w gospodarstwie reprezentatywnym w Austrii w 2012 roku (względem 2011 r.)

SO classes – Klasy SO/	II	III	IV	V
Income from family farm (incl. subsidies) (EUR) Dochód z rodzinnego gosp. rolnego (z subsydiami) (euro)	9 403	22 374	39 166	66 169
Total subsidies (EUR) Suma subsydiów (euro)	12 783	19 404	25 722	31 055
Surplus TFPa[1], *t*-1 = 100, i.e. expected change in income (EUR) Nadwyżka TFP[1], *t*-1 = 100, tj. oczekiwana zmiana dochodu (euro)	–2 052.97	–3 913.73	–2 165.11	–12 244.55
Drainage/inflow of economic surplus through prices, *t*-1 = 100 (EUR) Drenaż/napływ nadwyżki ekonomicznej przez ceny, *t*-1 = 100 (euro)	833.92	735.20	1 238.41	6 833.22
Actual change in income[2] – Faktyczna zmiana dochodu[2]	–1 219.1	–3 178.5	–926.7	–5 411.3
Surplus drainage/inflow relative to income (%) (outflow "–", inflow "+") Drenaż/napływ nadwyżki względem dochodu (%) (odpływ „–", dopływ „+")	8.9	3.3	3.2	10.3
Subsidies relative[3] to income (incl. subsidies) (%) Udział subsydiów[3] w dochodzie (z subsydiami) (%)	135.9	86.7	65.7	46.9
Revenue (EUR) – Przychody (euro)	42582	73 622	120 063	226 484
Subsidies relative to revenue (incl. subsidies) (%) Udział subsydiów w przychodzie (z subsydiami) (%)	30.0	26.4	21.4	13.7
Payment for public goods (EUR) Opłata za dobra publiczne (euro)	7 000	9 470	11 491	11 960
Payment for public goods relative to total subsidies (%) Udział opłaty za dobra publiczne w subsydiach ogółem (%)	54.8	48.8	44.7	38.5
Payment for public goods relative to income (%) Udział opłaty za dobra publiczne w dochodzie (%)	74.4	42.3	29.3	18.1
Political rent (EUR) – Renta polityczna (euro)	5 783	9 934	14 231	19 095
Political rent relative to income (%) Udział renty politycznej w dochodzie (%)	61.5	44.4	36.3	28.9
Political rent relative to total subsidies (%) Udział renty politycznej w subsydiach ogółem (%)	45.2	51.2	55.3	61.5
The sum of rents (economic and political) (EUR) Suma rent (ekonomiczna i polityczna) (euro)	6 616.92	10 669.20	15 469.41	25 928.22
The sum of rents (economic and political) relative to income (%) Udział sumy rent (ekonomicznej i politycznej) w dochodzie (%)	70.4	47.7	39.5	39.2

[1] Total Factor Productivity.
[2] The sum of the value of the TFP surplus and its drainage is equal to the actual growth/fall in a family farm's agricultural income in 2012 relative to 2011.
[3] It is assumed that payments for public goods include set-aside and agri-environmental payments, support for less favoured areas, and other subsidies under rural development programmes.
Source: own elaboration based on FADN data.
[1] Łączna produktywność czynników wytwórczych.
[2] Suma wartości nadwyżki TFP i jej drenażu równa się faktycznemu wzrostowi/spadkowi dochodu z gospodarstwa rodzinnego w rolnictwie w 2012 względem 2011 r.
[3] Przyjęto założenie, że charakter opłaty za dobra publiczne mają dopłaty za odłogowanie, rolnośrodowiskowe, ONW i pozostałe PROW.
Źródło: opracowanie własne na podstawie danych FADN.

Table 5. Drainage of surplus, CAP payments for public goods and political rent for a representative farm in Slovakia in 2012 (relative to 2011)
Tabela 5. Drenaż nadwyżki, opłata za dobra publiczne z WPR i renta polityczna w gospodarstwie reprezentatywnym w Słowacji w 2012 roku (względem 2011 r.)

SO classes – Klasy SO	III	IV	V	VI
Income from family farm (incl. subsidies) (EUR) Dochód z rodzinnego gosp. rolnego (z subsydiami) (euro)	5 804	18 948	30 231	–137 669
Total subsidies (EUR) – Suma subsydiów w euro	22 126	51 289	159 809	481 228
Surplus TFPa[1], *t*-1 = 100, i.e. expected change in income (EUR) Nadwyżka TFP[1], *t*-1 = 100, tj. oczekiwana zmiana dochodu (euro)	–3 556.26	11 682.94	–502.52	–141 934.79
Drainage/inflow of economic surplus through prices, *t*-1 = 100 (EUR) Drenaż/napływ nadwyżki ekonomicznej przez ceny, *t*-1 = 100 (euro)	2 484.67	4 471.98	17 299.85	67 188.98
Actual change in income[2] – Faktyczna zmiana dochodu[2]	–1 071.6	16 154.9	16 797.3	–74 745.8
Surplus drainage/inflow relative to income (%) (outflow "–", inflow "+") Drenaż/napływ nadwyżki względem dochodu (%) (odpływ „–", dopływ „+")	42.8	23.6	57.2	–48.8
Subsidies relative[3] to income (incl. subsidies) (%) Udział subsydiów[3] w dochodzie (z subsydiami) (%)	381.2	270.7	528.6	–349.6
Revenue (EUR) – Przychody (euro)	7 5199	15 7291	51 2168	2 426 394
Subsidies relative to revenue (incl. subsidies) (%) Udział subsydiów w przychodzie (z subsydiami) (%)	29.4	32.6	31.2	19.8
Payment for public goods (EUR) Opłata za dobra publiczne (euro)	6 490	1 8953	50 259	114 236
Payment for public goods relative to total subsidies (%) Udział opłaty za dobra publiczne w subsydiach ogółem (%)	29.3	37.0	31.4	23.7
Payment for public goods relative to income (%) Udział opłaty za dobra publiczne w dochodzie (%)	111.8	100.0	166.2	–83.0
Political rent (EUR) – Renta polityczna (euro)	1 5636	3 2336	10 9550	366 992
Political rent relative to income (%) Udział renty politycznej w dochodzie (%)	269.4	170.7	362.4	–266.6
Political rent relative to total subsidies (%) Udział renty politycznej w subsydiach ogółem (%)	70.7	63.0	68.6	76.3
The sum of rents (economic and political) (EUR) Suma rent (ekonomiczna i polityczna) (euro)	18 120.67	36 807.98	126 849.85	434 180.98
The sum of rents (economic and political) relative to income (%) Udział sumy rent (ekonomicznej i politycznej) w dochodzie (%)	312.2	194.3	419.6	–315.4

[1] Total Factor Productivity.
[2] The sum of the value of the TFP surplus and its drainage is equal to the actual growth/fall in a family farm's agricultural income in 2012 relative to 2011.
[3] It is assumed that payments for public goods include set-aside and agri-environmental payments, support for less favoured areas, and other subsidies under rural development programmes.
Source: own analysis based on FADN data.
[1] Łączna produktywność czynników wytwórczych.
[2] Suma wartości nadwyżki TFP i jej drenażu równa się faktycznemu wzrostowi/spadkowi dochodu z gospodarstwa rodzinnego w rolnictwie w 2012 względem 2011 r.
[3] Przyjęto założenie, że charakter opłaty za dobra publiczne mają dopłaty za odłogowanie, rolnośrodowiskowe, ONW i pozostałe PROW.
Źródło: opracowanie własne na podstawie danych FADN.

provided them with a bonus of EUR 4,472, the income grew by EUR 16,154.9.

Despite the declining productivity (by EUR 502.5), "large" farms (V) experienced a growth in incomes because the narrowing price scissors triggered an inflow of EUR 17,299.9. In other farm classes, the decline in productivity was not offset by positive effects of price movements. Therefore, their incomes decreased, and remained negative (EUR -137,669) in the very large farms (cf. Table 5).

As mentioned earlier, the role of subsidies in the Slovakian agricultural production cannot pass unnoticed. The share of subsidies in the incomes of "medium small" (III) farms is 381.2%. As regards the largest farms (VI), the subsidies are three and a half times higher than the negative incomes. The total amount of subsidies disbursed to "large" farms is more than five times higher than their incomes. Meanwhile, the average share of compensations for public goods is around 30% of total subsidies.

As assessed, the "net political rent" is several times higher than the incomes in all classes of farms, and represents 70% of total subsides, on average. These are the worst figures from the perspective of losses in social prosperity across all clusters.

SUMMARY

The authors made an attempt to demonstrate that the amount of EU agricultural subsidies should not be considered as a "political rent" in its entirety in view of the political rent definition formulated as a part of the public choice theory. Neither the payments for the delivery of public goods nor the compensations for other market failures (e.g. information asymmetry) may be regarded as a political rent. For these activities, a valuation methodology was proposed in order to estimate the net political rent. According to the study, the share of net political rent in the farms' P&L account depends on the type of agrarian structure. As a matter of fact, the CAP subsidies do more than rewarding the delivery of public goods and compensating for the possible outflow of the surplus through market failures: they also support the incomes as a net political rent, resulting in a loss of prosperity. Interestingly, despite the global system of agricultural prices, the rent-seeking mechanism varies significantly between the identified agrarian structures:

- In Western European countries grouped in class I, the net rent represents as much as 90% of incomes earned by "medium-small" farms (and over 36% of incomes earned by the largest ones). In turn, the share of net rent in total subsides ranges from 80% to nearly 100% (in the largest farms). This was caused by the agriculture's relatively low contribution to the creation of public goods. Another reason is that the surplus did not flow out through market mechanisms. If considered to be a market failure, such outflow should be compensated with state aid. Furthermore, a farm representative of this cluster makes effective use of the agricultural market conditions by taking over the economic rents from other agribusiness sectors.
- In Eastern European countries grouped in class II, the share of "net political rent" in the incomes ranges from 56.1% in "very small" farms to 74.4% in "very large" ones, whereas the share of net political rent in total subsidies ranges from 68.62% to 94.4%. Smaller farms from this group are unable to benefit from the economic recovery in the global agriculture sector, probably due to a low degree of contractual integration. However, they deliver relatively larger volumes of public goods. In this cluster, the data reveals the existence of two lines of development for the agriculture sector. The largest farms already follow the path traced by their Western European counterparts (type I).
- In the EU countries with the most sustainable agriculture sectors, the share of net political rent in the incomes in 61.5% (in small farms) and 28.9% (in the largest ones), whereas the share of net rent in total subsidies ranges from 45% to 61%. This is the best result from the social prosperity perspective and an indication of the desired development direction for the European agriculture model.
- In countries/regions grouped in cluster IV, where the structural changes resulted in the establishment of large agricultural enterprises, the net political rent in all farm classes is several times higher than the incomes, and represents on average 70% of total subsidies. This kind of agrarian structure exists only due to the rent-seeking mechanism and generates considerable losses in prosperity. The long-term financing for this group of farms under the CAP is the most controversial issue.

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RENTY POLITYCZNE W GOSPODARSTWACH ROLNYCH O ZRÓŻNICOWANEJ STRUKTURZE AGRARNEJ: ANALIZA W UKŁADZIE MACIERZY INPUT-OUTPUT DLA WYBRANYCH KRAJÓW UE

Streszczenie. Powszechnie uważa się, że subsydiowanie rolnictwa w ramach wspólnej polityki rolnej UE jest wypłacaniem rent politycznych dla rolników. Autorzy podjęli próbę pokazania, że uznawanie całej sumy subsydiów dla rolnictwa w UE za „rentę polityczną" jest niesłuszne z punktu widzenia definicji renty politycznej sformułowanej w teorii wyboru publicznego. Za rentę polityczną nie można uznać bowiem opłaty za dostarczanie dóbr publicznych oraz transferów kompensujących inne zawodności rynku (np. asymetrię informacji). Zaproponowano metodologię wyceny tych działań w celu oszacowania tzw. czystej renty politycznej, bazując na macierzach input-output dla gospodarstw reprezentatywnych wg FADN i rachunkach zmiany produktywności całkowitej. Autorzy sformułowali hipotezę badawczą, że wielkość subsydiów jest nie tylko funkcją lobbingu politycznego, ale także (jeśli nie przede wszystkim) funkcją zawodności rynku dotyczących dóbr publicznych i asymetrii informacji. Przeprowadzone badania pokazały, że udział czystej renty politycznej w rachunku wyników gospodarstw rolnych zależy od typu struktury agrarnej. Co ciekawe jednak, mechanizm *rent-seeking*, mimo globalnego układu cen rolnych, różni się znacząco w zależności od struktury agrarnej.

Słowa kluczowe: renty polityczne, rolnictwo, analiza input-output, rent-seeking, WPR

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