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COMMON AGRICULTURAL POLICY BENEFICIARIES: EVIDENCE OF INEQUALITY FROM A NEW DATA SET

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IES Working Paper 4/2021

$$\frac{1}{(m-1)!} p^{m-1} (1-p)^{n-m} = p \sum_{\ell=0}^{n-1} \frac{\ell+1}{n} \frac{(n-1)!}{(n-1-\ell)! \ell!} p^{\ell} (1-p)^{n-1-\ell} = p \frac{n-1}{n} \sum_{\ell=0}^{n-1} \left[\frac{\ell}{n-1} + \frac{1}{n-1} \right] \frac{(n-1)!}{(n-1-\ell)! \ell!} p^{\ell} (1-p)^{n-1-\ell} = p^2 \frac{n-1}{n} +$$

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Bibliographic information:

Garcia-Bernardo J., Jansky P. and Misak V. (2021): "Common Agricultural Policy Beneficiaries: Evidence of Inequality from a New Data Set" IES Working Papers 4/2021. IES FSV. Charles University.

This paper can be downloaded at: <http://ies.fsv.cuni.cz>

Common Agricultural Policy Beneficiaries: Evidence of Inequality from a New Data Set

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February 2021

Abstract:

Although the Common Agricultural Policy (CAP) is the largest expenditure programme of the European Union, not much is currently known either about its beneficiaries or about how unequally payments are distributed among them. We thus create a novel – and currently the most extensive – publicly available data set of CAP's beneficiaries. We exploit a recent EU regulation which requires member states to disclose the identities and amounts allocated to all beneficiaries. We succeed in collecting data for 21 member states for up to 4 years between 2015 and 2018. We find that the extent of payment inequality among CAP beneficiaries differs among member states and that old member states generally tend to exhibit lower inequality while new member states tend to suffer from higher inequality. Specifically, Gini coefficients are lowest in Belgium, Finland, France and Denmark and highest in Slovakia, Estonia, Bulgaria and Czechia. In an additional exploratory analysis, we combine the amassed data with a company ownership database, which enables us to identify owners that are either foreign or common for multiple beneficiaries.

JEL: D63, H25, L11, Q14, Q18

Keywords: Common Agricultural Policy; Common Agricultural Policy beneficiary; inequality; agriculture; European Union

Acknowledgements: We thank Tomáš Baďura, Jan Cibulka, Jakub Dienstbier, Ondřej Kokeš, Alan Matthews, Miroslav Palanský, and Jiří Skuhrovec for helpful comments.

Javier Garcia-Bernando has received funding from the European Research Council (ERC) under the European Union's Horizon 2020 research and innovation programme (grant agreement number 638946). Petr Janský and Vojtěch Mišák acknowledge support from the Czech Science Foundation (P403/18-21011S). To ensure transparency and replicability and in line with the open science practices our database and code can be found in an Open Science Foundation depository.

1 Introduction

The Common Agricultural Policy (CAP) is the largest expenditure programme of the European Union. Under its auspices 42 billion euros in income support through direct payments to farmers were distributed in 2018 alone. However, a great deal of information regarding CAP beneficiaries remains unknown, including e.g. how evenly payments are distributed within countries and how individual member states compare with others over time. The lack of definite answers to such questions is largely the result of the challenging nature of the relevant data. Although the publication of information on CAP beneficiaries is required pursuant to the Regulation (EU) No 1306/2013, we have only managed to access approximately three quarters of the member states' data. Moreover, as the available data lack ownership information, it is thus impossible to observe neither whether the beneficiaries are members of the same holding company nor whether the beneficial owners are located in another country; both of these aspects naturally have implications for estimating the distribution of CAP beneficiaries. In addition, the data sets provided by individual member states differ with respect to both the amount and detail of published information.

To overcome these challenges, we collect as much data from CAP beneficiaries as possible in order to help us better understand the distribution of CAP payments and CAP in general. We combine newly available member state-specific data sets of CAP beneficiaries to create a detailed EU-wide data set. Using this novel data set, we find that the extent of inequality between beneficiaries differs between countries but not as much between individual years. In addition, to take cross-border ownership into account, we merge it with the best available EU-wide company ownership information, i.e. Bureau van Dijk's Orbis database. While this only provides us with a partially matched data set, it is still a substantial improvement over the status quo of having no detailed ownership information at all. We also find that there are relatively few cross-border ownership links for the beneficiaries with available ownership data. Using the best currently available data set, we identify a number of areas for improvement – most of which require changes in policy.

We contribute to existing literature by providing these findings as well as the new data set, designed to facilitate further research. In contrast with existing single-country studies, our cross-country data set enables us to make systematic comparisons between member states. Furthermore, unlike existing literature, which analyses restricted data sets by Farm Accountancy Data Network, we investigate all CAP beneficiaries, including smallholder

farmers. Our approach seems to be more efficient because it allows us to provide analyses of inequality between CAP beneficiaries using standard inequality indicators such as Gini coefficients and Lorenz curves.

In addition to the data disclosure requirement stemming from the Regulation (EU) No 1306/2013 which we make use of in this paper, the related Regulation (EU) No 1307/2013 requires member states to provide annual data on payments made to the beneficiaries of the European Agricultural Guarantee Fund (EAGF) for auditing, monitoring and forecasting purposes. The EAGF funds market measures and provides income support through direct payments, which ensures income stability, and remunerates farmers for environmentally friendly farming and for delivering public goods not normally paid for by the markets. The European Commission produces an annual report on the basis of the received data. For the purpose of our research we focused on all types of CAP subsidies that countries received from EU funds, that is EAGF and EAFRD (European agricultural fund for rural development). European Commission itself describes EAGF as a fund that provides *“income support for farmers and market measures, such as intervention buying, private storage aid, or exceptional market disturbance measures.”* EAFRD contributes to *“[rural development](#) programs, projects and measures.”* European Commission (2020).

According to Grethe et al., (2018) EAGF covers approximately 75 % of the proportion of EU agricultural budget, and EAFRD remaining 25 %.

The European Commission publishes the distribution of aid (i.e. payments) by size-class since the 2002/03 financial year. Their published headline tables present all direct payments and, e.g. European Commission (2018) covers 41.56 billion euros to 6.54 million beneficiaries in 2017. The document presents a range of tables with information on the distribution of CAP payments across 15 size categories according to an established payment scale. The obvious crucial limitation of this data source is that only a limited number of descriptive statistics tables are published and that the data remains confidential within the European Commission. Moreover, these published data are grouped, thereby limiting the accuracy of Gini coefficients computation. Furthermore, although the EC lists the total aggregated amounts using individual beneficiary identification code, it is unclear to what extent these unique identifiers deal with within- and cross-country ownership challenges (whether or not they link members of the same ownership group or identify owners from abroad).

We now discuss existing academic literature which overwhelmingly relies on Farm Accountancy Data Network (FADN) data. It defines itself as “an instrument for evaluating the

income of agricultural holdings and the impacts of the Common Agricultural Policy” (Farm Accountancy Data CR, 2020). However, FADN surveys do not cover all CAP beneficiaries, but only those which are considered commercial—i.e., FADN omits small farmers. We perceive this as the most serious limitation of previous research which analyses CAP using FADN data sets and simultaneously a key reason why our data set is more suitable for investigating payment inequality among CAP beneficiaries. Inequality among CAP beneficiaries has been one of the sticking points in recent CAP reforms as well as a topic of interest among researchers. Bonfiglio et al. (2016) analyzed the impact of CAP subsidies across the EU and argue that even a big reallocation of funds through CAP may become less redistributive due to intersectoral and within-regional linkages. At the same time, Bonfiglio et al. (2016) note that CAP reforms, including the one in 2015, have been motivated by reducing inequality among beneficiaries.

Similarly, Georgiev (2017) argues that reducing inequality among EU member states is a public good for the entire EU. Moreover, the author claims that countries with higher per capita incomes should be willing to give up a substantial part of CAP subsidies on behalf of farmers from member states with lower per capita income. Georgiev (2017) also notes that the redistributive effect of CAP was originally (in the times of the European Economic Community) driven by a negotiation process between Germany and France. As Germany benefitted more from the free movement of goods, this advantage was offset by higher agriculture subsidies to French farmers. Michalek et al. (2011) use FADN data from 1995 to 2007 to estimate the income distribution effects of CAP subsidies for farmers and landowners and they argue that CAP subsidies have almost no impact on land rents.

In addition to the EU-wide studies, a number of single-country studies are also available. For Slovenia, e.g. Bojnec and Fertö (2019) use FADN data from 2007 to 2013 to investigate the impact of CAP reform on farm household income inequality in Slovenia. Using a Gini decomposition method, the authors find a link between a shift in CAP and farm household income in Slovenia. One limitation of the research carried out by Bojnec and Fertö (2019) seems relevant to our study, i.e. that Gini coefficient analyses do not provide any evidence of causal relationships. In other words, the investigation of the possible determinants of inequality among CAP beneficiaries is beyond the scope of this paper. In contrast, Sutherland (2019) attempts to perform such an analysis and argues that while agriculture subsidies in Scotland are associated with increases in land values, agriculture subsidies have enabled environmental improvements. The author views agricultural enterprise as a specific form of

business activity, because it is located in a specific place and produces significant amounts of public goods such as food, carbon dioxide removal or environmental protection in general. Therefore, CAP subsidies should not be viewed purely as an EU budget transfer. Sutherland (2019) argues that farm ownership and management should also be taken into consideration when discussing rural inequalities. Moreover, Sutherland (2019) claims that even though CAP funds constitute a huge proportion of the EU budget, they account for less than half of what farmers in the USA receive. On the other hand, the structure of US agriculture subsidies differs from that of the EU: the largest share of agriculture subsidies goes to expenditures on nutrition, while the largest amount of money in the EU is associated with direct payments to farmers (Blandford and Matthews, 2019). Using the data from the United Kingdom's Department for Environment, Food and Rural Affairs, Bateman & Balmford (2018) examine the cumulative distribution of subsidies paid under the current CAP Basic Payment Scheme and how it might look in case equal payments were distributed to all farmers as one of the starting points in their discussion of United Kingdom's post-Brexit agricultural policy. Although it is expected that the United Kingdom will fully exit the European Union on 31 December 2020, we include the United Kingdom in our data set. A comparison of our results with the future UK agriculture subsidies policy should prove interesting, as there is still significant uncertainty regarding a post-Brexit UK agriculture programme (Choi et al., 2020).

Several papers which use FADN data examine the impact of the 2003 CAP reform. In an earlier working paper Zahrnt (2009) estimates member states' share in total CAP subsidies under different post-2013 scenarios and, based on these estimates Zahrnt (2009) identifies possible winners and losers. Another paper is by Rizov et al. (2013), who investigate the impact of CAP on farm total factor productivity in EU15 countries. Based on FADN data, they argue that the 2003 CAP reform significantly improved farm productivity and that agriculture subsidies impacted farm productivity negatively until 2003 and only turned into a positive influence in several countries following the reform.

In a recent FADN-based paper, Czyzewski & Smedzik-Ambrozy (2017) investigate the regional structure of CAP subsidies and how they impact the productivity factor. This article is one of many dealing with the effect of agriculture subsidies on farm productivity. Prior to the 2003 CAP reform, authors such as Ciaian & Swinnen (2009) or Rizov, Pokrivcak, & Ciaian (2013) argued that CAP subsidies have a positive impact of farm production, but a negative impact on farm productivity. Czyzewski and Smedzik-Ambrozy (2017) claim that the EU is divided into three regional clusters according to the structure of budgetary subsidies.

The first group typically combines direct support with payments for public goods. The second cluster primarily provides so-called direct CAP payments. In the third set, CAP subsidies seem to be highly politically sustainable as they consist of heterogeneous forms of support for farms. In this paper we compare our results with conclusions by Czyzewski and Smedzik-Ambrozy (2017) to see whether our results also differ between these three regional groups.

The remainder of the paper is structured as follows. We first explain how we construct our data set by merging the individual member states' lists of CAP beneficiaries, subsequently combining it with ownership information from Orbis data set. In our results we focus on descriptive statistics as well as estimated indicators of inequality, prior to providing our conclusions.

2 Empirical framework

In this paper we focus on two types of empirical analyses. First, we look for inequalities in CAP subsidies across years and countries. Second, we utilize the Orbis database to investigate the cross-border ownership structure of CAP subsidy beneficiaries

2.1 Data and descriptive statistics

In this paper we collect data of CAP subsidies from 21 EU countries first published in 2013 as a result of an EU regulation on the financing, management and monitoring of a common agricultural policy¹. Data were collected from websites of each EU country. For each country, we know the names of the beneficiaries, the year in which a subsidy was provided, and the total value of the subsidy. For some countries we also have information about the beneficiary's municipality and city; furthermore, we are able to identify what part of the EU CAP subsidy belongs to the EAGF or EAFRD fund. While 21 countries seem to be enough to provide a good analysis of CAP beneficiaries and EU countries have a duty to provide information on CAP beneficiaries, some countries do not meet this condition. Several countries did not provide data in readable format (for example, they keep them only on

¹ Regulation (EU) No 1306/2013 of the European Parliament and of the Council of 17 December 2013 on the financing, management and monitoring of the common agricultural policy and repealing Council Regulations (EEC) No 352/78, (EC) No 165/94, (EC) No 2799/98, (EC) No 814/2000, (EC) No 1290/2005 and (EC) No 485/2008.

websites in formats which made it difficult to collect)². All data are listed in euros; values for countries whose currency is not the euro were converted to euros using annual exchange rate averages³. Coverage of countries and financial years in our data as well as the number of observations is summarized below in Table 1.

Table 1: Data coverage of countries and years, number of observations per year

	Included in Orbis	2014	2015	2016	2017	2018
Austria	No				113,605	112,261
Belgium	Yes			15,732	14,233	
Bulgaria	Yes			602,388	651,236	
Croatia	No			104,232	108,296	
Cyprus	Yes			143,913	142,923	
Czechia	Yes				136,008	33,669
Denmark	No				159,138	151,605
Germany*	No	2	4	338	312	135
Estonia	Yes			22,371	21,081	
Finland	No				223,790	228,478
France	Yes			1,038,518		
Hungary	Yes			575,880		
Italy	Yes			1,047,864	1,047,551	
Latvia	Yes		6	50	82	139
Netherlands	No				114,528	130,106
Portugal	No				199,737	200,315
Romania*	No		3,981	9,202	10,885	
Slovakia	Yes			56,066	58,553	
Slovenia	Yes			59,751	58,730	
Spain	No				1,963,411	1,907,677
United Kingdom	Yes			154,744	155,273	

Source: Authors on the basis of the cited data sources.

Note: Included in Orbis column give us with information if the country beneficiaries were analysed using Orbis database.

**Full data unavailable.*

To analyse inequalities in CAP subsidies we compute Gini coefficients and provide three types of graphs in the Appendix: histograms, density plots and Lorenz curves for each country and financial year. Since some countries (France, Hungary and Latvia) provided us with data for all financial years combined, we are unable to identify which subsidies belong to which

² Poland is a special case since their relevant webpage seems to be out of order during the time of research (as of 20 November 2020 as well as previously).

³ Exchange rates taken from the dedicated website of the European Central Bank.

financial years; we analyse these countries in section 3. We then compute Gini coefficients to measure inequality among all CAP beneficiaries.

Gini coefficients are computed in R using a function `Gini` that uses a formula as recommended by Buchan (2002):

$$Gini = \frac{\sum_{1 \leq i, j \leq n} |x_i - x_j|}{2 \cdot n \cdot \sum_{i=1}^n x_i}$$

Where n is the number of subsidies in a particular country and year (as displayed in Table 3) and x is the particular subsidy in the country and year. Gini coefficient take values from 0 to 1, where 1 means a perfect inequality when one beneficiary in a country receives all subsidies. Gini equals to zero represents a perfectly equal distribution of CAP subsidies in a country.

Similarly, Lorenz curves are plotted using a function `Lc` in R.

However, available data on CAP beneficiaries does not allow us to observe whether all beneficiaries in our data sets in fact constitute the final beneficiaries. For example, the most significant amount of money in Slovakia in 2016 was received by the Agricultural Paying Agency, various agricultural cooperatives, and the Ministry of Agriculture and Rural Development of the Slovak Republic, all of which are government institutions. On the other hand, when these three beneficiaries are excluded from the data set, our Gini coefficient decreases from 0.895 to 0.894; we consider this change to be negligible.

2.2 Ownership information from Orbis

In order to take cross-border ownership into account, we complement data on CAP beneficiaries with ownership information. We merge CAP data set with the best available EU-wide company ownership information, i.e. Bureau van Dijk's Orbis database. Due to the earlier unavailability of some countries' data, we include only 11 countries in the Orbis analysis (see Table 2 for details). In total, we successfully match 359,151 companies out of a total of 1,867,879 CAP beneficiaries. The six individual data matching steps are summarised in Table 2 while the outcome of the CAP–Orbis data matching is provided in Table A1 in the Appendix. In case more than one company is matched to an individual beneficiary, we single out the best available match so as to facilitate unique identification. For matched beneficiaries, Table A3 in the Appendix shows a summary of the country of the ultimate company owners as a function of the country.

Table 2: CAP–Orbis data matching

Original number of unique companies: 1,888,262

Matched by	Companies matched	Observations matched	Companies unmatched	Step
exact name, country, postal code	20,383	22,811	1,867,879	1
exact name, country and municipality	38,239	47,361	1,829,640	2
exact name and country	93,630	1,827,334	1,736,010	3
approximated name, country and postal code	12,451	16,010	1,723,559	4
approximated name, country and municipality	32,508	124,216	1,691,051	5
approximated name, country and first four letters of the name	182,323	1,993,646	1,508,728	6

Source: Authors

3 Results and discussion

We start by analysing the extent of inequality in payments among CAP beneficiaries using Gini coefficients. We find that inequality differs considerably across member states. Generally, old member states tend to have lower inequality, while the new member states tend to have higher inequality. Specifically, Gini coefficients are lowest in Belgium, Finland, France and Denmark and highest in Slovakia, Estonia, Bulgaria and Czechia (see Table 3 and Fig. 1). We also visualize the Gini coefficient graphically through Lorentz curves for individual countries (Figs. A7—A11 in the Appendix). Taken together, the Gini coefficient of all EU countries is 0.79, which we display graphically in Fig. 2.

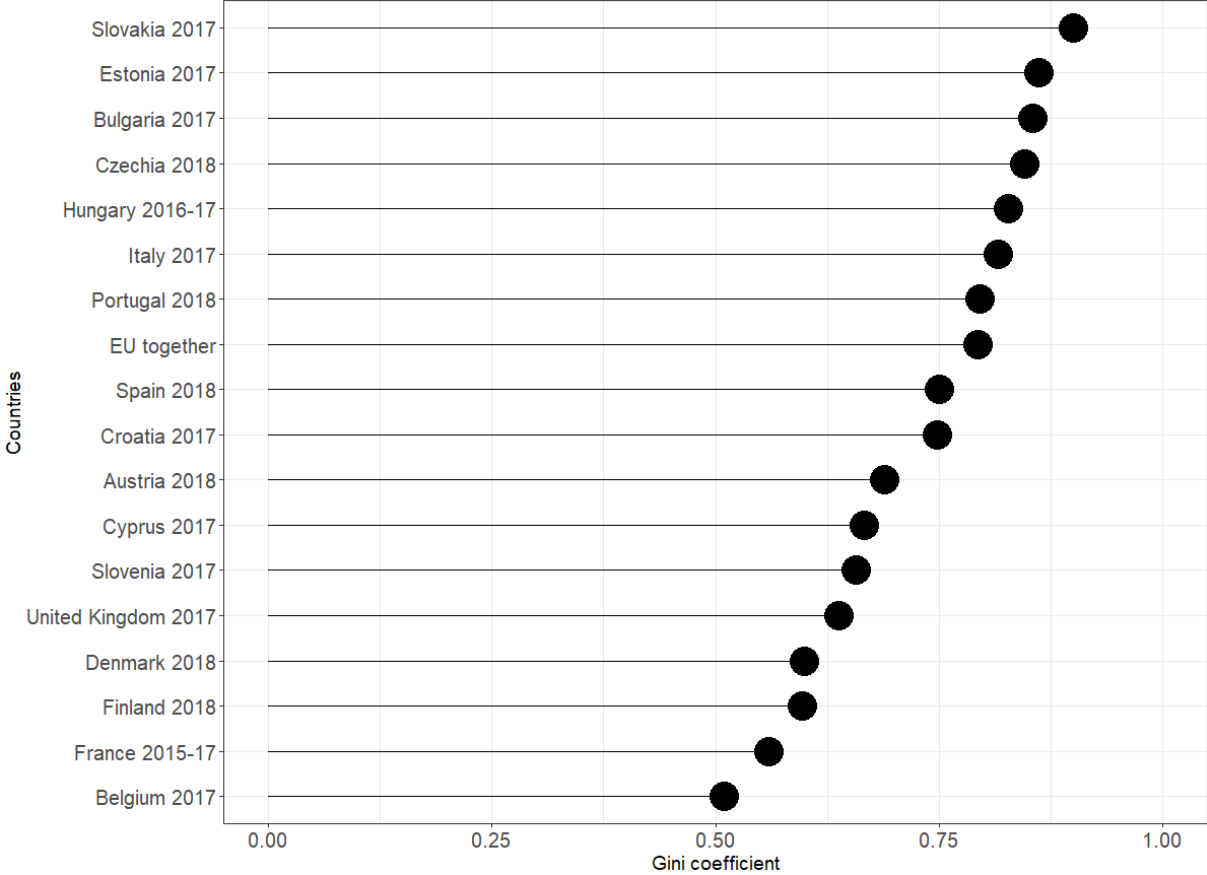
Table 3: Gini coefficients, only when more than 50 observations are available in the particular year

	2015	2016	2017	2018
Austria			0.616	0.689
Belgium		0.54	0.509	
Bulgaria		0.852	0.855	
Croatia		0.746	0.748	
Cyprus		0.795	0.666	
Czechia			0.844	0.846
Denmark			0.592	0.599
Germany		0.745	0.883	0.797
Estonia		0.867	0.861	
Finland			0.455	0.597
France		0.559		
Hungary		0.827		
Italy		0.846	0.816	
Latvia		0.734	0.734	0.706
Netherlands*			0.748	0.756
Portugal			0.8	0.795
Romania	0.642	0.637	0.637	
Slovakia		0.895	0.9	
Slovenia		0.674	0.657	
Spain			0.757	0.75
United Kingdom		0.636	0.638	

Source: Authors on the basis of the cited data sources.

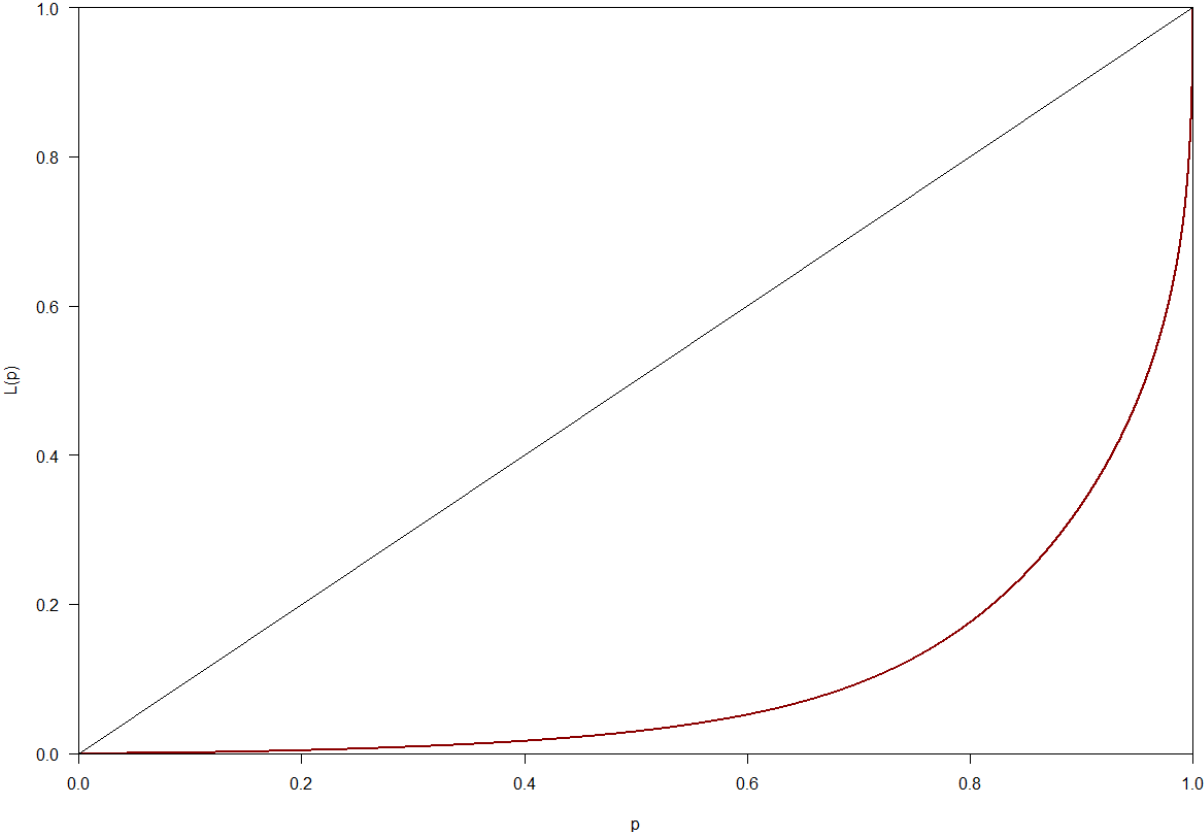
* Gini coefficients might be influenced by state organizations.

Figure 1. Visualization of the gini coefficients for all countries in Table 3. Only the most recent year is shown.



Source: Authors on the basis of the cited data sources.

Figure 2: Lorenz curve for all EU countries combined as if it were one country. More unequal distributions create lower curves (higher Gini coefficients). The diagonal line dividing the plot indicates a hypothetical uniform distribution. Gini coefficient 0.79.



Source: Authors on the basis of the cited data sources.

We find the lowest measure of inequality among CAP beneficiaries (i.e., the subsidies are more equally distributed) in Belgium, France and Finland. On the other hand, the highest inequality among CAP subsidies are in Slovakia, Estonia and Bulgaria. Figure 1 compares inequalities in the terms of Gini coefficients from each state. More detailed analyzes in the terms of histograms, Lorenz curves and density plots is provided in the Appendix. We can summarize our findings from the Figure 1 and figures in the Appendix as follows. Large countries have more CAP beneficiaries than small countries, which seems natural. Moreover, all histograms are skewed to the right, which indicates that the majority of small farmers in all countries receive small subsidy amounts. This finding also comes from the shape of the density plots. The results from density plots indicate a potentially skewed distribution of CAP payments while also providing information on the structure of agricultural enterprises in each

country. While we recognize that both of these factors are present in our results, we cannot disentangle the two, which may be considered a limitation.

Inequality as measured using Gini coefficients does not correspond to the results reached by Czyzewski and Smedzik-Ambrozy (2017). As discussed above, the authors argue that the EU is divided into three clusters of regions according to the structure of budgetary subsidies. The lowest measures of inequality among CAP beneficiaries are found in Belgium, France and Finland. All three of these are present in a group of countries where support for farms is provided primarily through single farm and area payments. However, the group also includes countries with the highest inequality of agriculture subsidies, i.e. Czechia and Slovakia. Therefore, we cannot conclude that different CAP payment methods impact CAP subsidy inequality.

3.1 Additional results obtained using Orbis ownership information

A limitation of the results presented above is that different beneficiaries may actually correspond to one single owner—i.e., the same owner can own several beneficiaries. In order to address this limitation, we combine the CAP data with a company ownership database, which enables us to identify owners that are foreign or common to multiple beneficiaries. The outcome of Orbis–CAP matching varies across countries. The detailed results of this matching for CAP payment values and number of beneficiaries are provided in Table 4. While for Belgium we are able to match 76% of CAP payments and 88% of beneficiaries, these figures are almost zero for Latvia and Italy.

First, we analyse the residence of the owners of beneficiaries. We find that the global ultimate owners (also known as a final or beneficial owner) of beneficiaries usually reside in the same countries as the beneficiaries. The share of CAP payments by country of global ultimate owner is presented in Table A2, including several cases of note. For example, Denmark ultimately owns Slovak beneficiaries which account for a total of 12% of CAP payments to all matched Slovak beneficiaries. The investment activities of Denmark into the Slovak agricultural industry (especially pig farming) has been previously identified in the literature (Šarjaková, 2007).

Next, we moved to the study of individual owners. We find that only 19 companies in the matched sample are the global ultimate owners of beneficiaries from more than one member state (Table 5). However, some of these cases receive sizeable payments. For example...
[here continue]

Table 4: Orbis–CAP matching results

	CAP payments total (euros)	Number of beneficiaries	CAP payments total – matched (euros)	Number of beneficiaries – matched	CAP payments total – matched (%)	Number of beneficiaries – matched (%)
Belgium	471,301,600	20,201	413,688,000	15,401	76	88
Bulgaria	206,203,900	106,655	91,986,430	43,314	41	45
Cyprus	32,728,860	14,038	8,870,106	2,248	16	27
Czechia	81,813,280	31,211	66,405,430	10,963	35	81
Estonia	-	-	-	-	-	-
France	2,420,184,000	222,950	1,186,167,000	96,873	43	49
United Kingdom	4,021,512,000	174,016	2,345,881,000	87,879	51	58
Hungary	-	-	-	-	-	-
Italy	2,480,204,000	1,057,178	38,217,620	10,262	1	2
Latvia	73,561,980	204	123,519	1	0	0
Slovenia	36,253,920	116,307	10,798,220	21,239	18	30
Slovakia	366,029,300	22,567	367,633,800	11,261	50	100

Source: Authors

Notes: We do not display results for Estonia and Hungary due to data irregularities. CAP payments total – matched (euros) for Slovakia covers also “negative subsidies”, that is payments that a beneficiary had to return from the previous financial year.

4 Conclusion

How unequally are payments distributed among the beneficiaries of the largest expenditure programme of the European Union, i.e. the Common Agricultural Policy? To answer this question, we created a new data set of CAP beneficiaries, exploiting a 2013 EU regulation which requires member states to disclose the identities and amounts allocated to all beneficiaries. We succeed in collecting the data for 21 member states for up to four years between 2015 and 2018, which makes it, to the best of our knowledge, the only and thus largest public data set of CAP beneficiaries. We analysed the newly created data set using histograms, density plots and inequality measurement methods including Lorenz curves and Gini coefficients.

We find that inequality in CAP payments differs among states. While old EU member states tend to have lower inequality among CAP beneficiaries, new member states exhibit higher inequalities. Gini coefficients are lowest in Belgium, Finland, France and Denmark while lowest Gini coefficients are in Slovakia, Estonia, Bulgaria and Czechia. While explaining these differences in full is beyond the scope of this research paper, an explanation might emerge once the new data set is combined with additional data sources.

Last, not least, we merged CAP data with a company ownership data set which makes us able to identify foreign owners or owners that are common for more beneficiaries. Similar analyses represent a promising area for further research.

We consider the challenges involved in collecting CAP subsidy beneficiaries from all EU countries and for multiple years to be the most significant obstacle for future research. However, matching such data with the Orbis database will help us investigate cross-country CAP beneficiaries. Moreover, we will thus be able to examine whether the cross-country ownership of farms and agricultural holdings changes over time. To summarize, our results promise hope for further research and may even constitute an important step for future negotiations of CAP following the end of the 2021–2027 financial framework.

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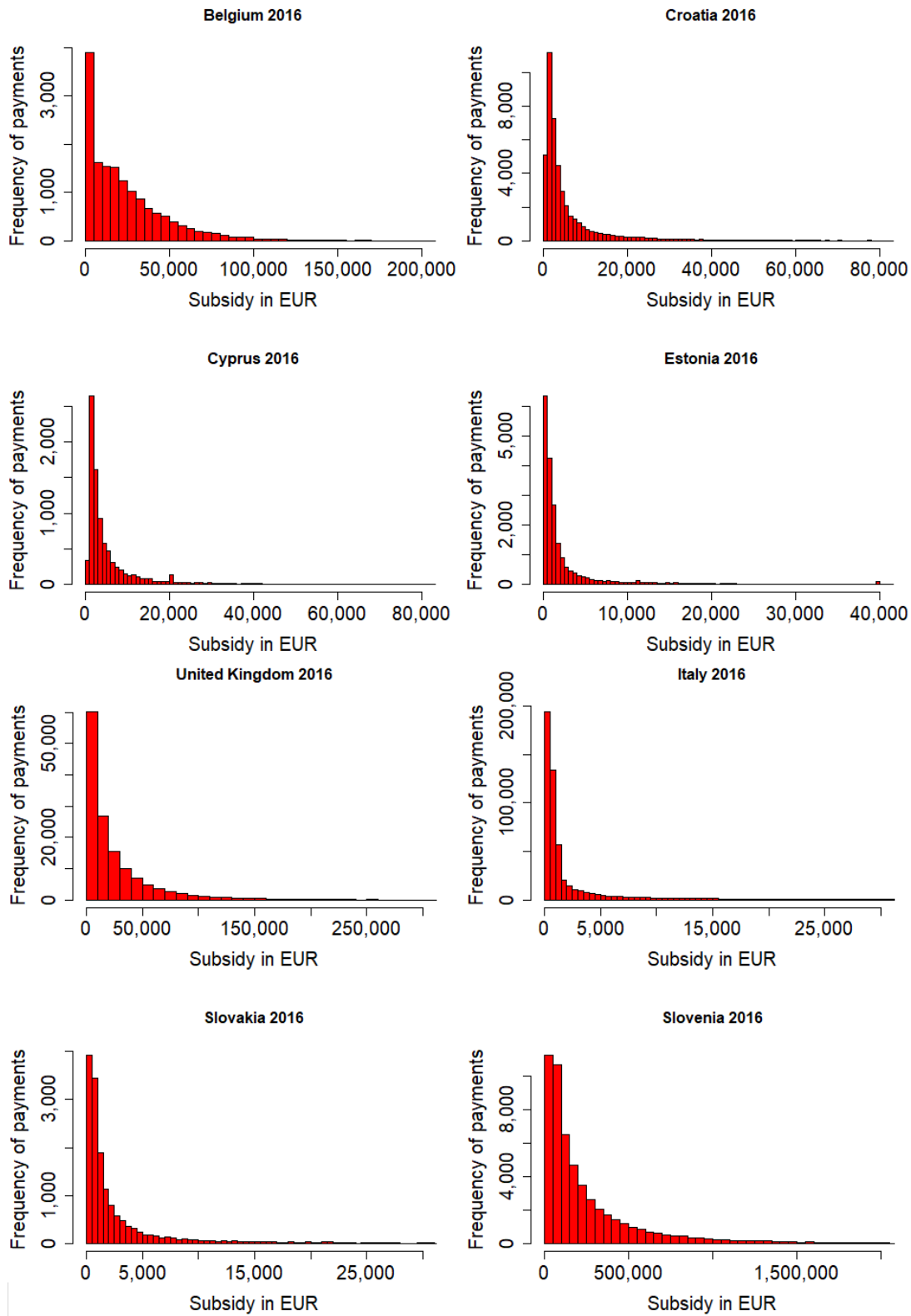
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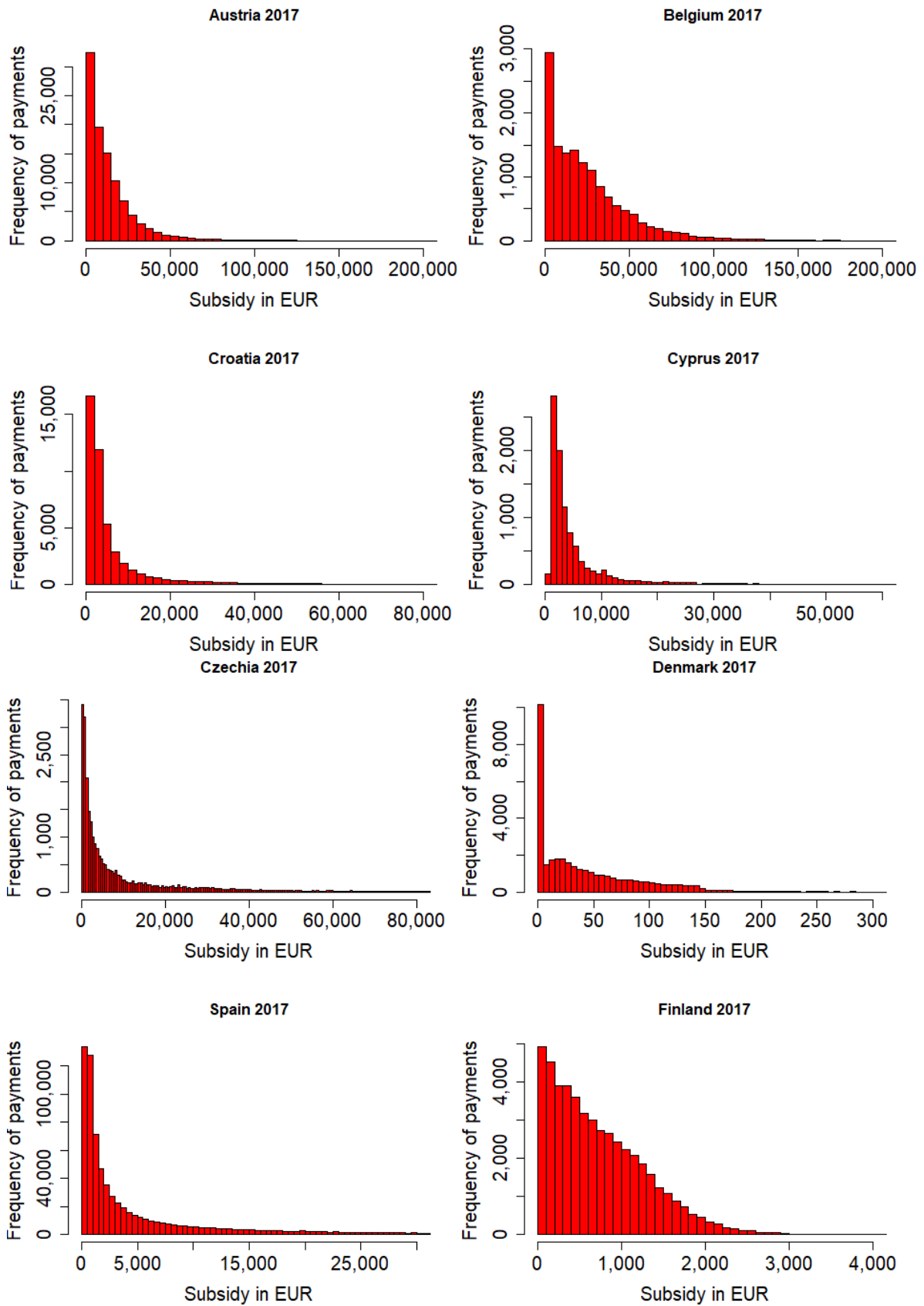
6 Appendix

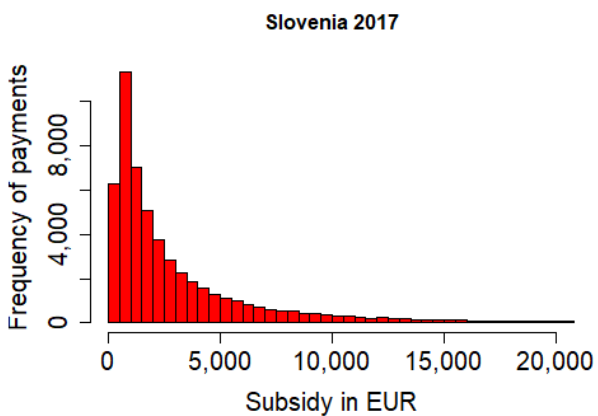
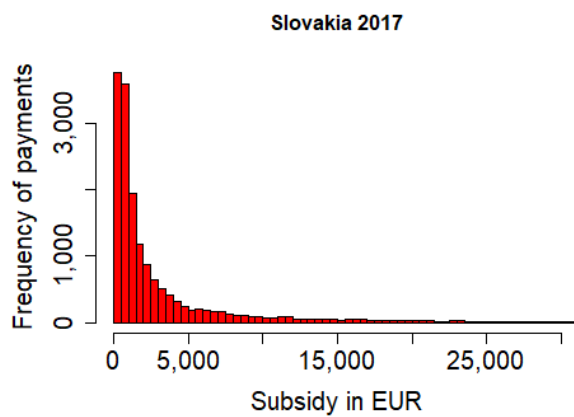
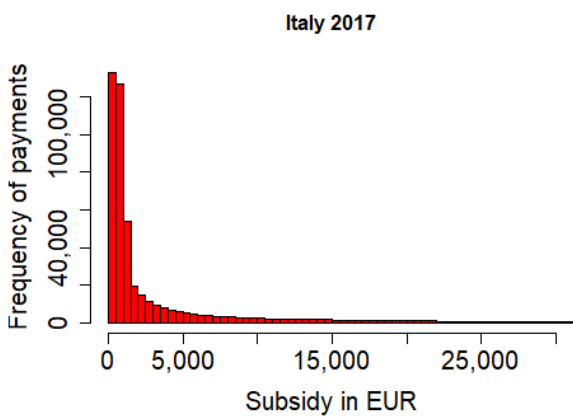
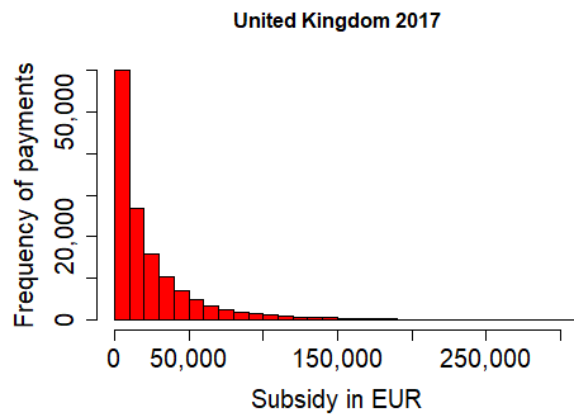
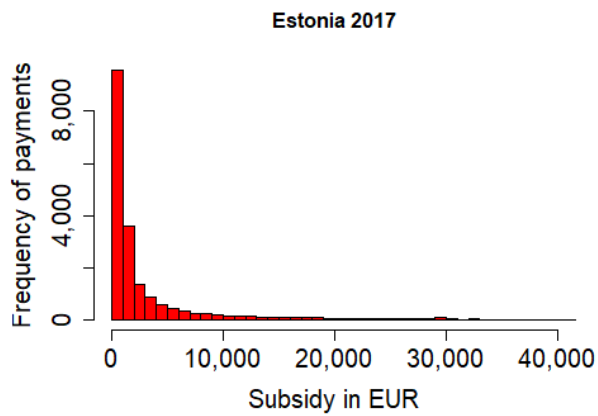
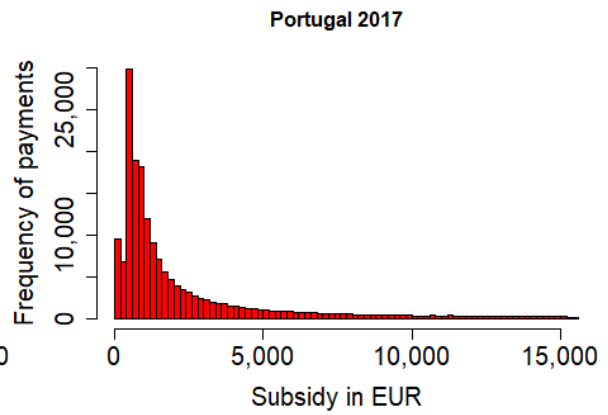
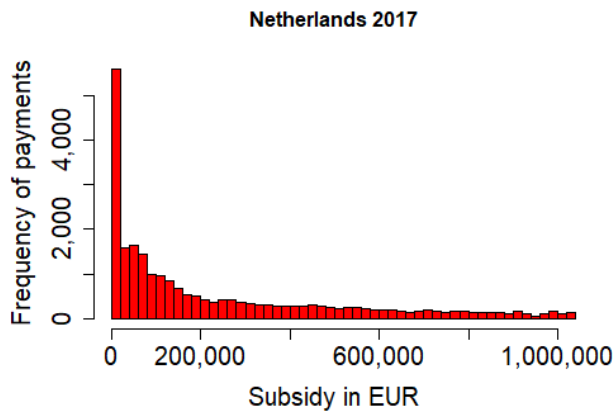
Figure A1: Histograms 2016



Source: Authors

Figure A2: Histograms 2017





Source: Authors

Figure A3: Histograms 2018

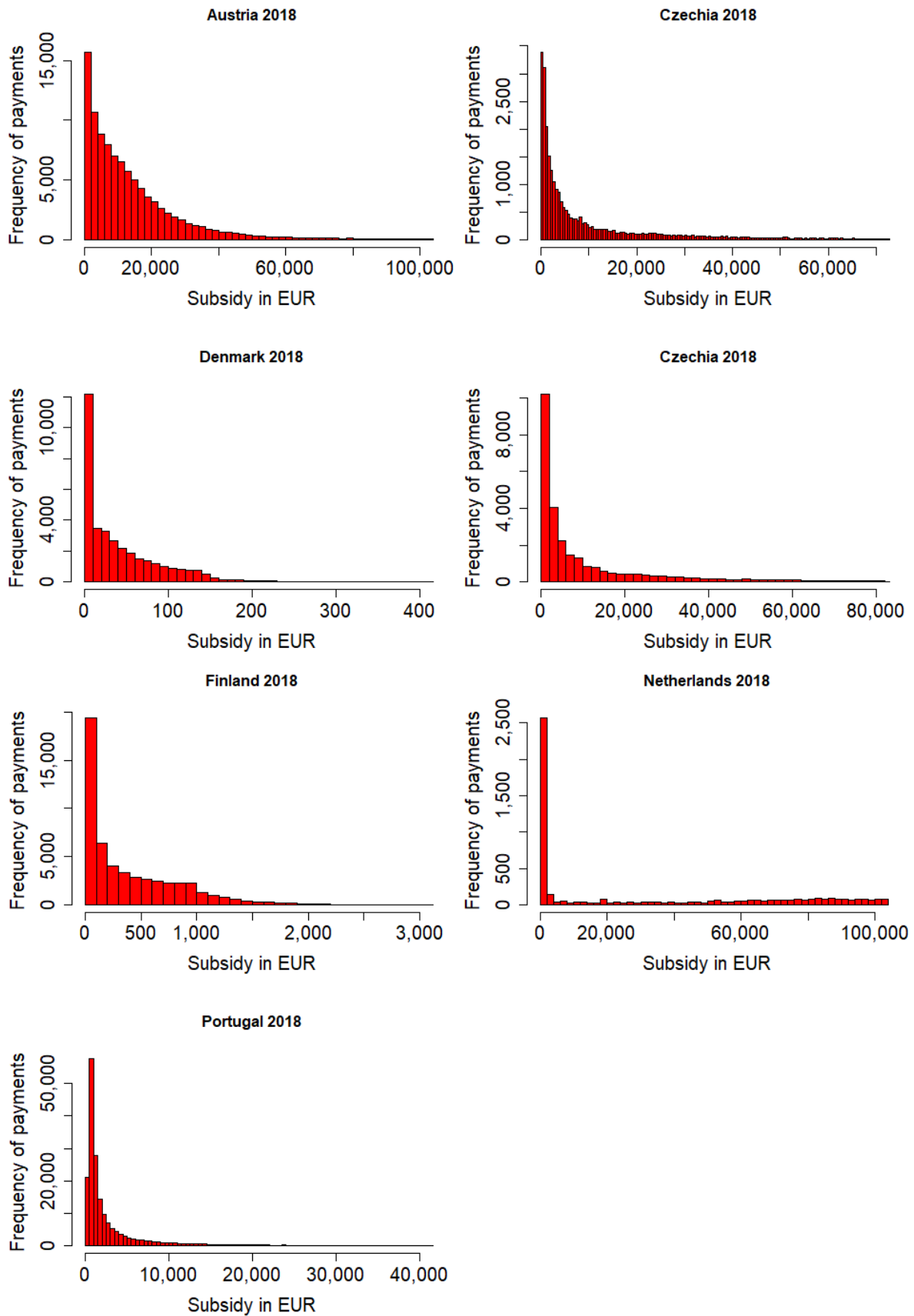
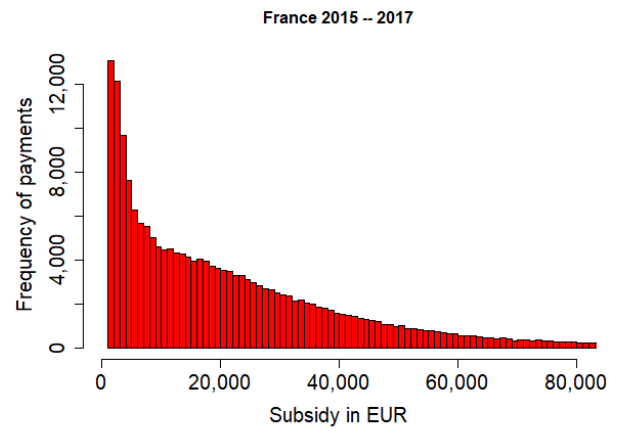
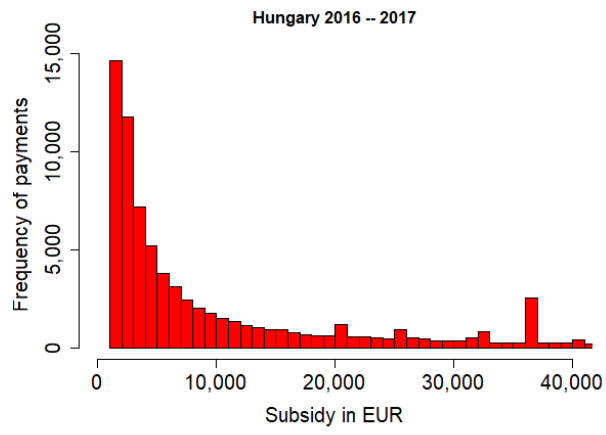
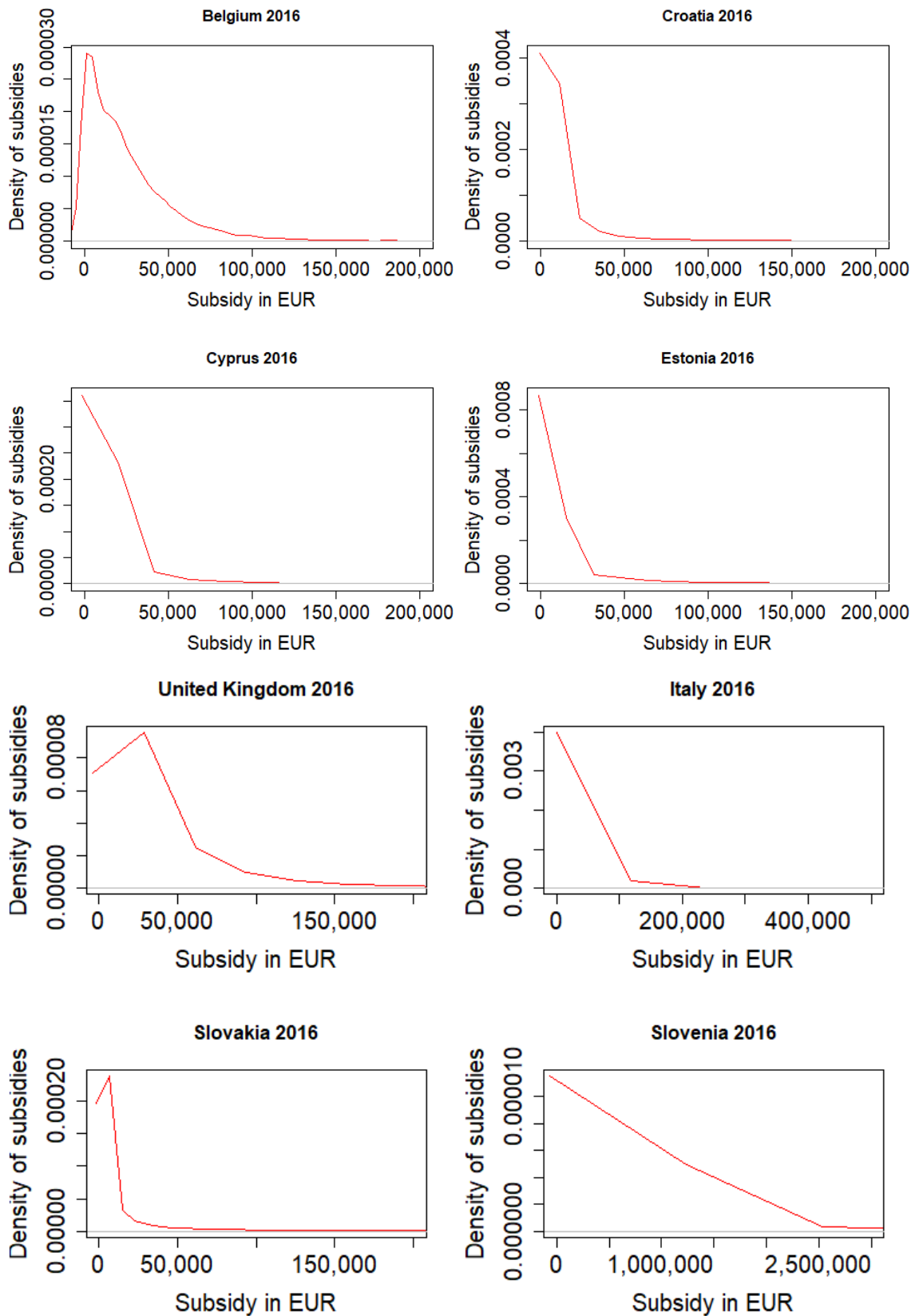


Figure A4: Histograms others



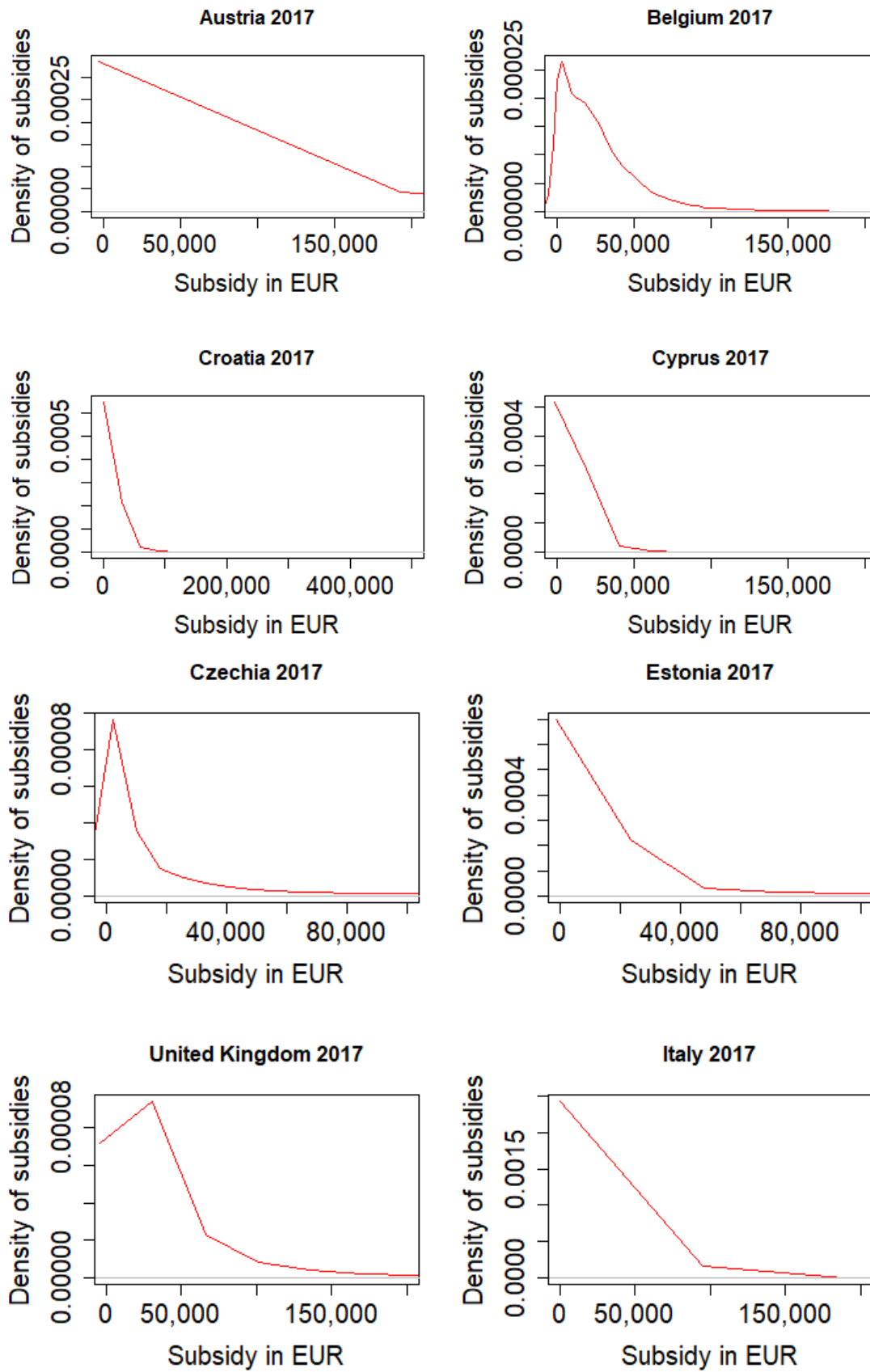
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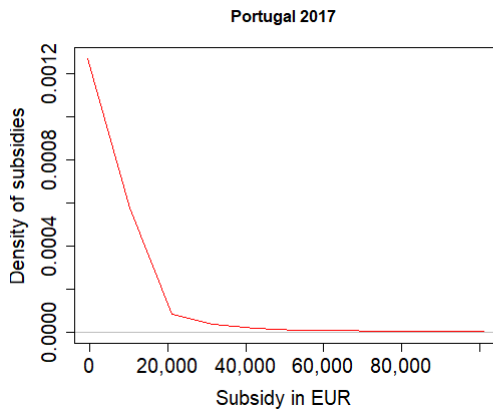
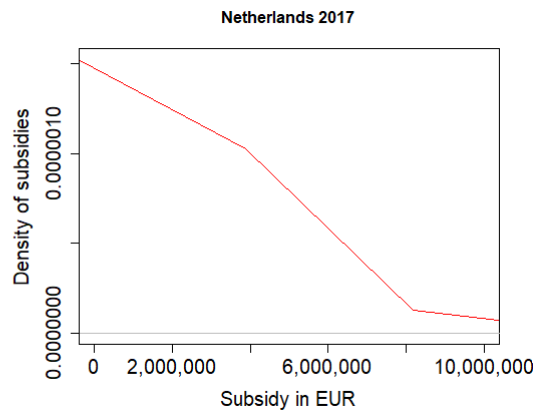
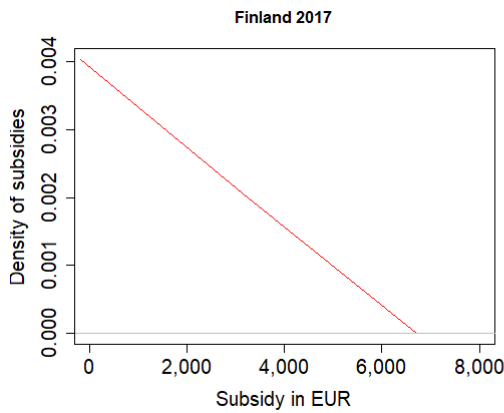
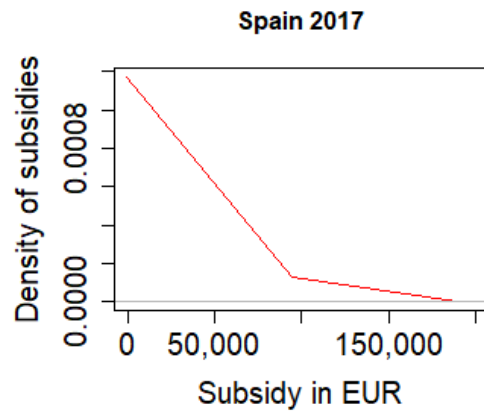
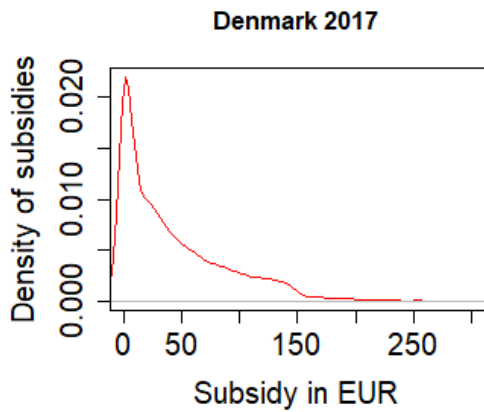
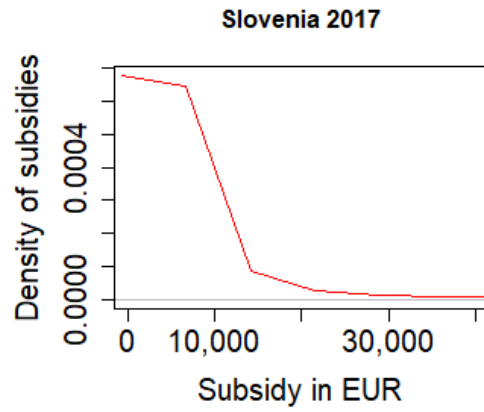
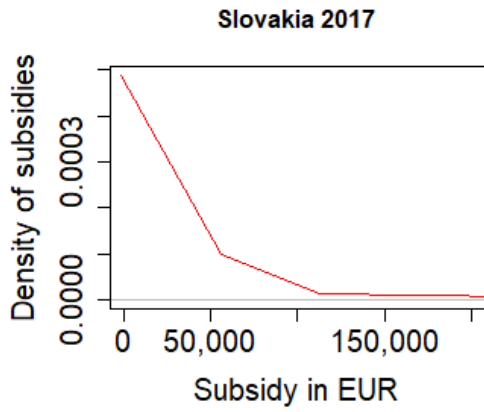
Figure A4: Density plots 2016



Source: Authors

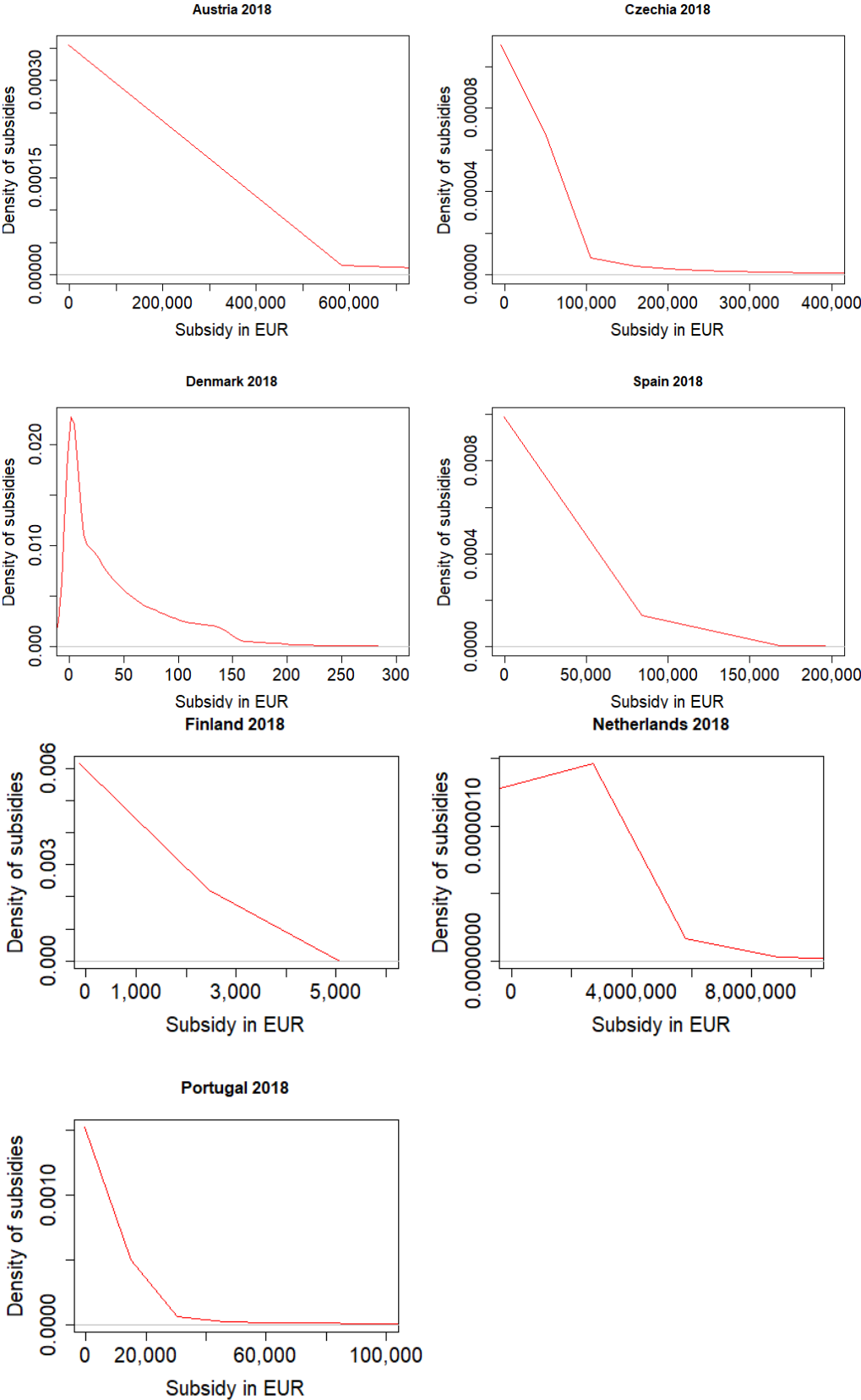
Figure A5: Density plots 2017





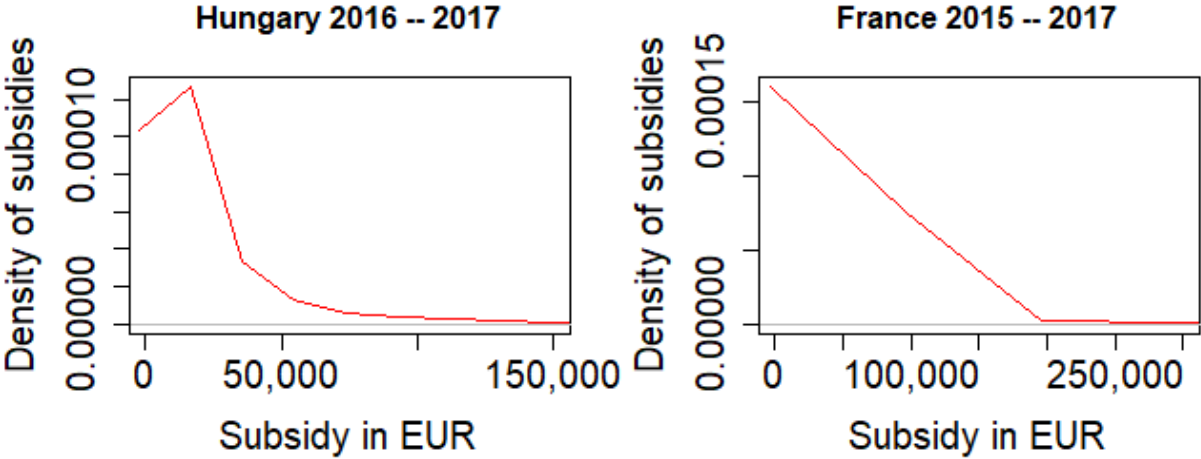
Source: Authors

Figure A6: Density plots 2018



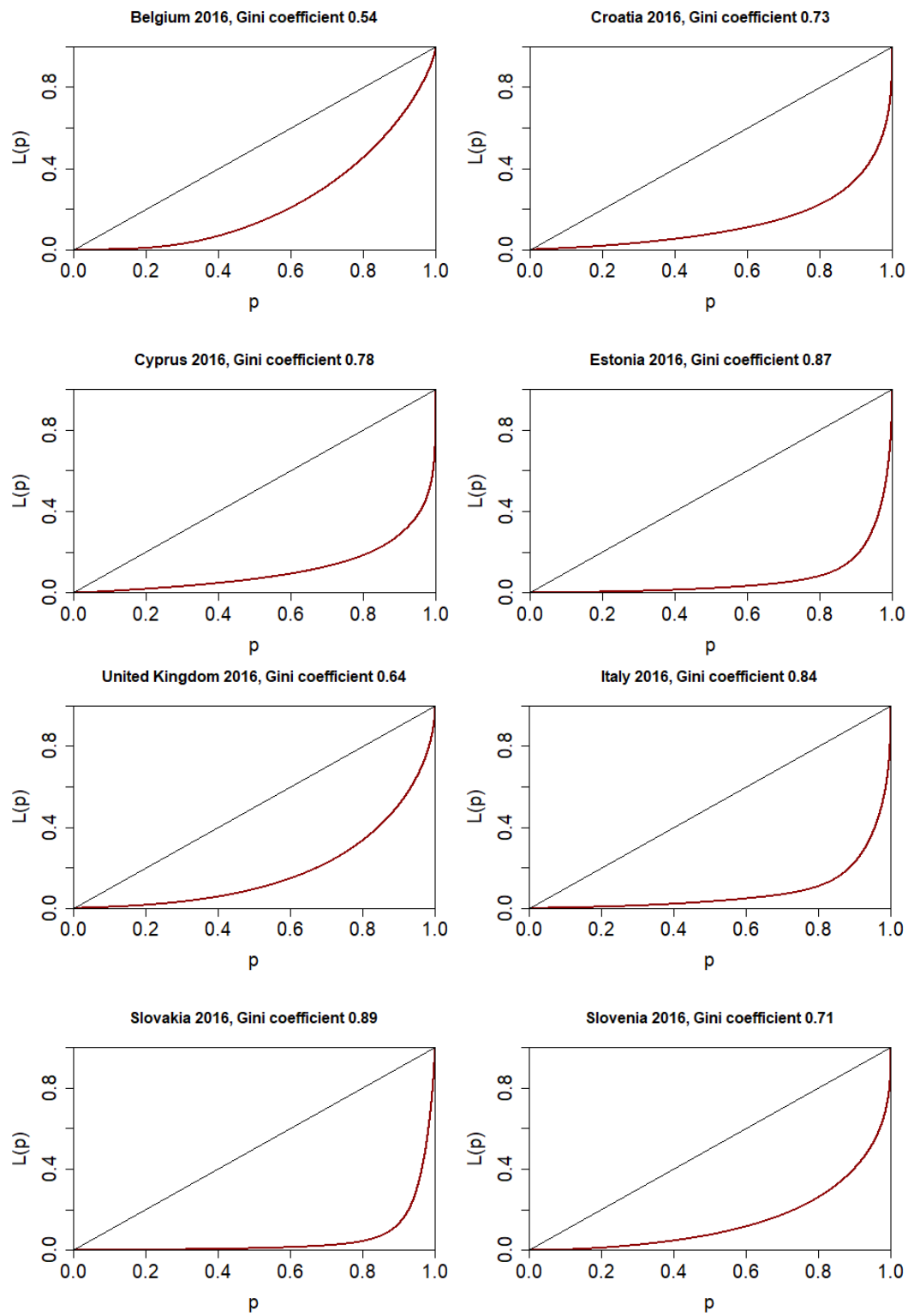
Source: Authors

Figure A7: Density plots others



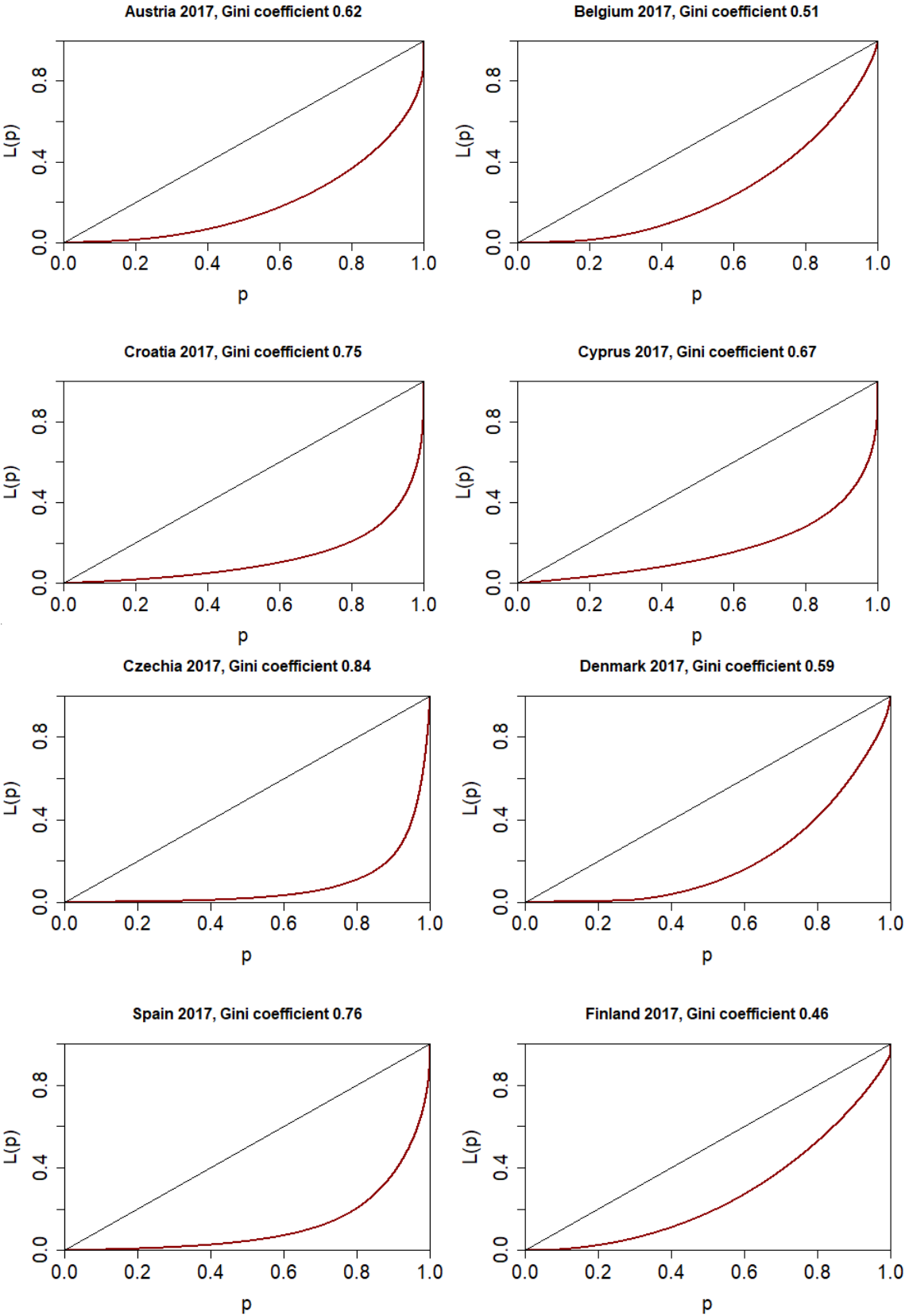
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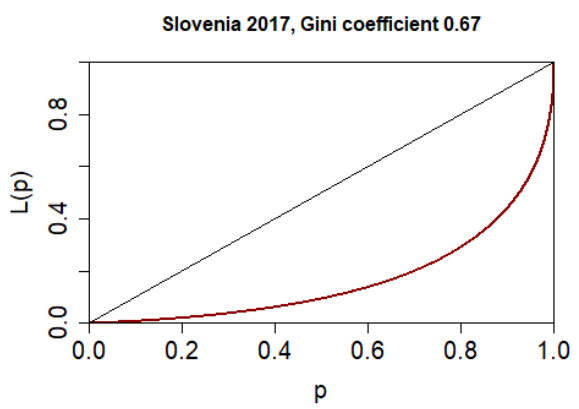
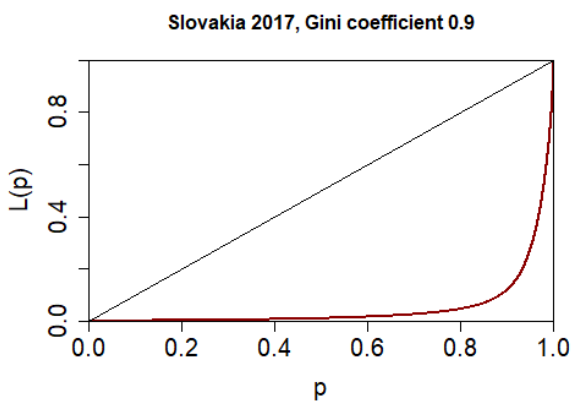
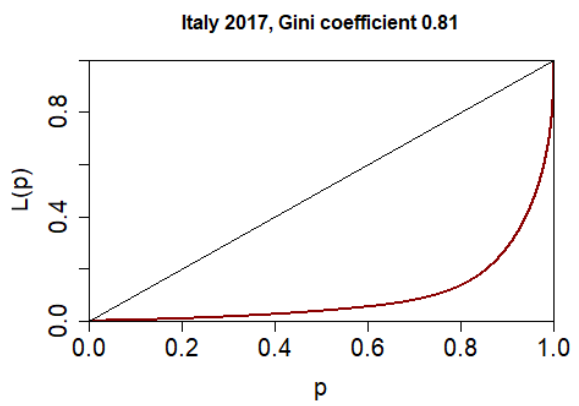
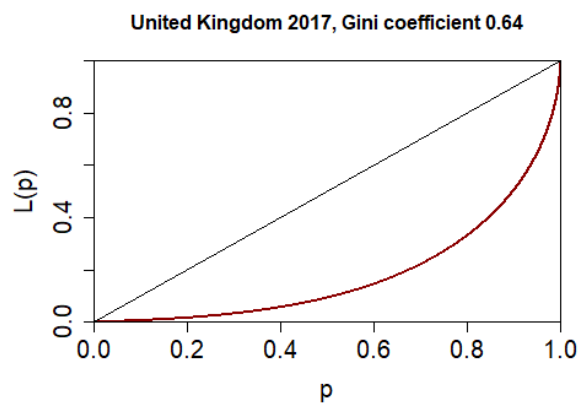
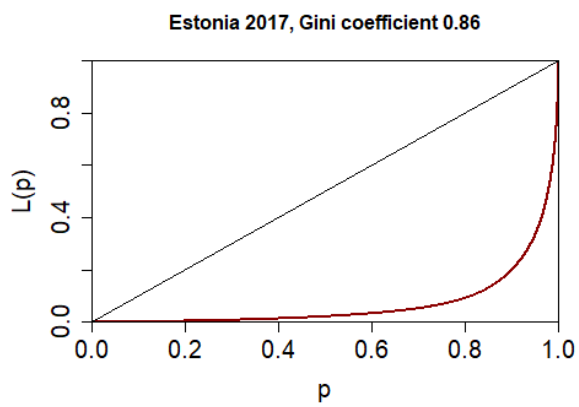
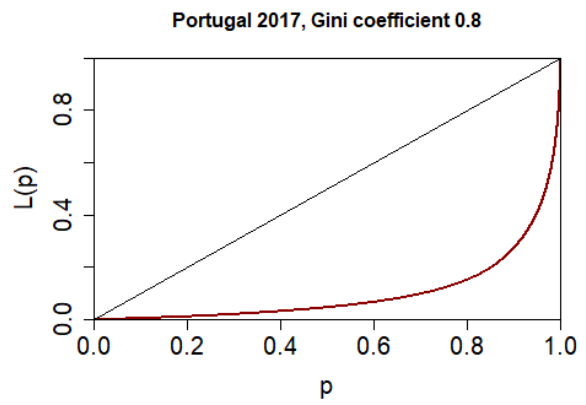
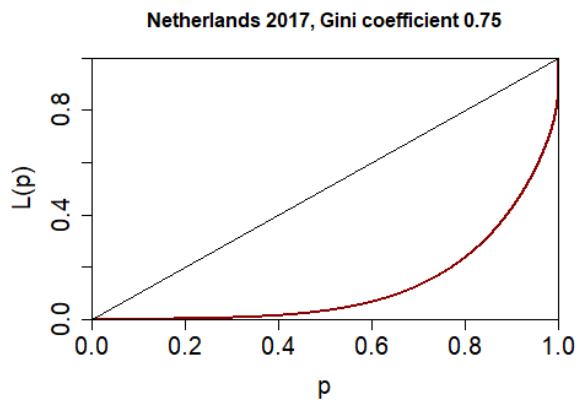
Figure A8: Lorenz Curves 2016



Source: Authors

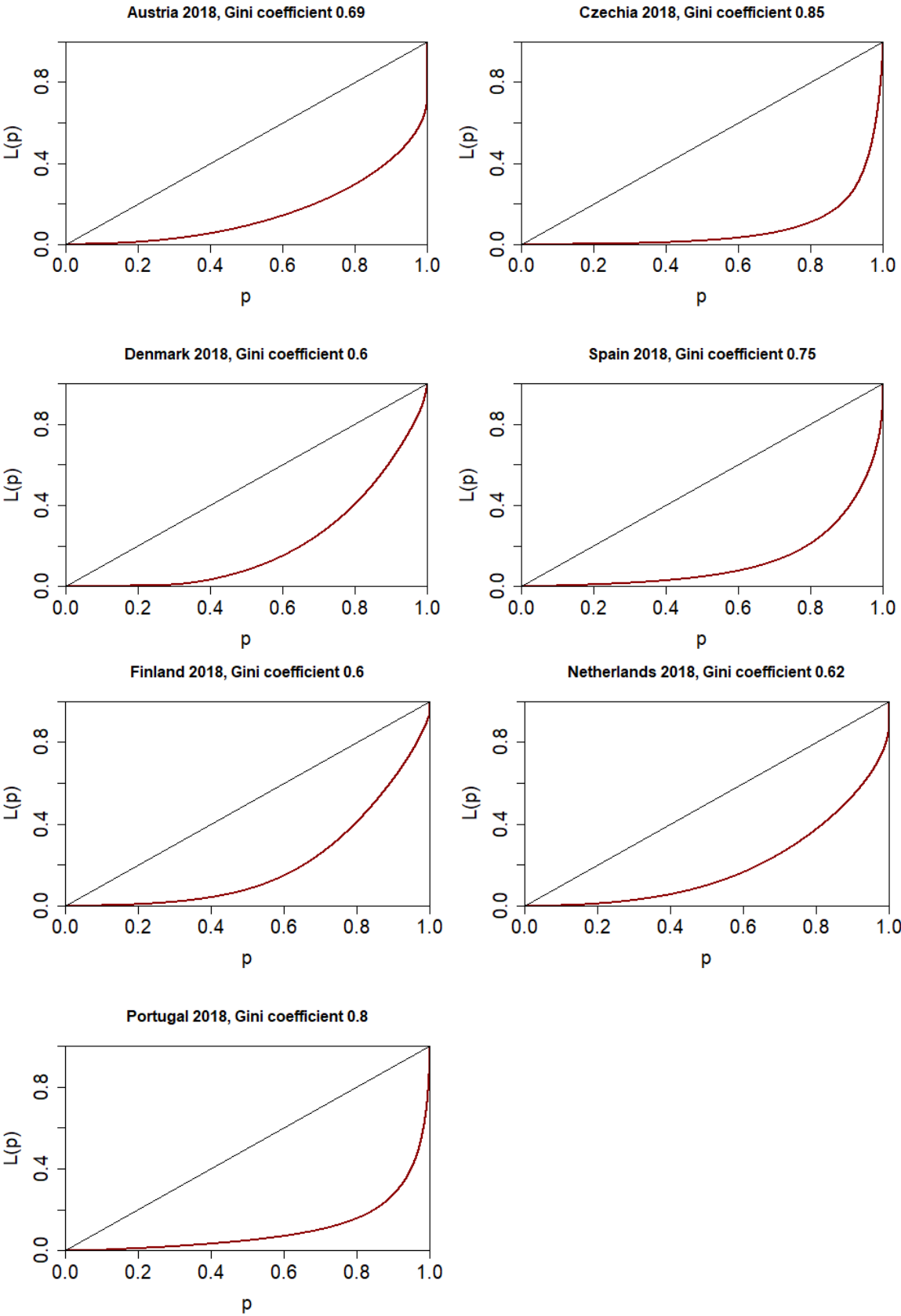
Figure A9: Lorenz Curves 2017





Source: Authors

Figure A10: Lorenz Curves 2018



Source: Authors

Figure A11: Lorenz Curves others

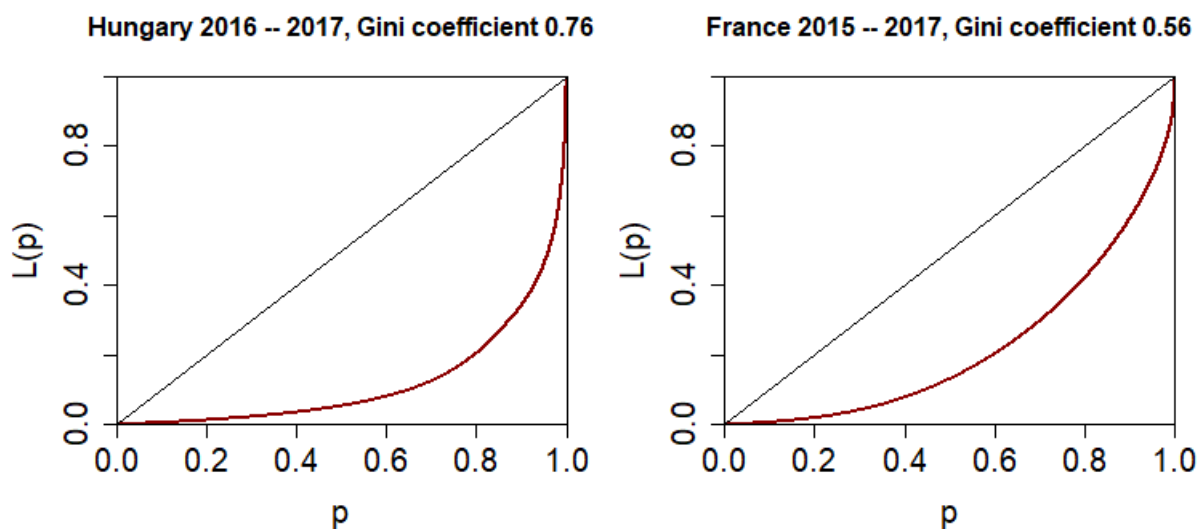


Table A1: Outcome of the CAP-Orbis data matching

	Step 1	Step 2	Step 3	Step 4	Step 5	Step 6
Companies matched	20,383	38,239	93,630	12,451	32,508	182,323
Companies remaining	1,867,879	1,829,640	1,736,010	1,723,559	1,691,051	1,508,728
Belgium	9,123	162	1,258	4,245	63	448
Bulgaria	407		2,405			37,010
Cyprus	107	3	348	208	13	1,460
Czechia	387	3,372	1,144		6,270	2,183
Estonia				19	260	4,812
France	1,083	143	33,152	2,311	376	59,792
Great Britain	1	10,170	18,398	7	16,433	37,530
Hungary	803	22,994	34,810	4,338	8,469	15,358
Italy			52	2		10,207
Slovenia	3,628	316	371		344	11,779
Slovakia	4,844	1,079	1,692	1,321	280	1,743

Source: Authors

Note: Each column shows how many companies have been matched with Orbis in each step (see Table 2 for the matching strategy).

Table A2: Percentage of CAP payments by country of global ultimate owner (%)

	Austria	Belgium	Bulgaria	Switzerland	Cyprus	Czechia	Germany	Denmark	Estonia	France
Belgium	0	98	0	0	0	0	0	0	0	0
Bulgaria	0	0	98	0	0	0	0	0	0	0
Cyprus	0	0	0	0	97	0	0	0	0	0
Czechia	0	0	0	0	1	86	1	0	0	0
Estonia	0	0	0	0	0	0	0	0	100	0
France	0	1	0	0	0	0	0	0	0	94
Great Britain	0	0	0	1	0	0	0	3	0	0
Hungary	1	0	0	1	0	0	1	2	0	1
Italy	0	1	0	1	0	0	0	0	0	4
Slovenia	0	0	0	0	0	0	0	0	0	0
Slovakia	0	0	0	0	0	2	2	12	0	0

Source: Authors

Table A2 continue: Percentage of CAP payments by country of global ultimate owner (%)

	Great Britain	Hungary	Italy	Luxembourg	Marshall Islands	Netherlands	Slovakia	USA	British Islands	Virgin	Unknown
Belgium	0	0	0	0	0	2	0	0	0		0
Bulgaria	0	0	0	0	0	0	0	0	1		0
Cyprus	0	0	0	1	2	0	0	0	0		0
Czechia	1	0	0	1	0	0	0	0	0		9
Estonia	0	0	0	0	0	0	0	0	0		0
France	0	0	0	0	0	1	0	0	0		1
Great Britain	75	0	1	0	0	0	0	1	1		12
Hungary	2	85	2	0	0	4	0	0	0		0
Italy	2	0	86	1	0	0	0	0	0		3
Slovenia	0	0	0	0	0	102	0	0	0		0
Slovakia	1	0	2	0	0	0	73	2	0		6

Source: Authors

Table A3: A summary of the country of the ultimate owners of the companies, as a function of the country

	Austria	Belgium	Bulgaria	Switzerland	Cyprus	Czechia	Germany	Denmark	Estonia	France	Great Britain
Belgium	0	1,881	0	0	0	0	0	0	0	2	1
Bulgaria	2	0	4,123	3	9	0	3	1	0	2	2
Cyprus	0	0	0	1	80	0	0	0	0	0	1
Czechia	13	1	0	4	16	3,642	11	5	0	1	16
Estonia	0	0	0	0	0	0	0	0	695	0	0
France	1	113	0	20	2	0	43	0	0	54,373	29
Great Britain	1	5	0	15	4	0	9	14	1	26	4,888
Hungary	5	1	0	2	1	0	3	2	0	7	1
Italy	1	2	0	4	0	0	0	0	0	5	1
Slovenia	0	0	0	0	0	0	0	0	0	1	0
Slovakia	9	0	0	1	5	17	4	23	0	2	1

Source: Authors on the basis of the cited data sources.

Notes: Table denotes how many companies receiving a subsidy in a particular country (vertical axis) come from the country on the horizontal axis.

Table A3 continue: A summary of the country of the ultimate owners of the companies, as a function of the country

	Hungary	Italy	Cayman Islands	Luxembourg	Marshall Islands	Netherlands	Slovakia	USA	British Virgin Islands	Unknown
Belgium	0	0	0	4	0	5	0	1	0	1
Bulgaria	0	1	0	4	0	2	0	3	4	6
Cyprus	0	0	0	2	37	0	0	0	0	0
Czechia	1	3	0	37	0	9	0	1	1	13
Estonia	0	0	0	0	0	0	0	0	0	0
France	0	23	10	49	0	40	0	28	5	42
Great Britain	0	8	26	8	0	13	0	87	19	284
Hungary	411	2	0	1	0	3	0	0	0	0
Italy	0	226	0	2	0	0	0	2	0	2
Slovenia	0	1	0	0	0	2	0	0	0	0
Slovakia	0	4	0	4	0	2	2,260	2	0	40

Source: Authors on the basis of the cited data sources.

Notes: Table denotes how many companies receiving a subsidy in a particular country (vertical axis) come from the country on the horizontal axis.

Table A4: Cases where one global ultimate owner received CAP payments in more than one member state

Member states	Value of combined CAP payments (euros)
Slovakia, Hungary	22,578,270
Czechia, Slovakia	4,194,089
United Kingdom, France	2,119,198
United Kingdom, Czechia	645,324
United Kingdom, Czechia, Slovakia	595,860
United Kingdom, France	341,982
France, Hungary	288,383
United Kingdom, France	225,960
United Kingdom, Bulgaria	183,758
United Kingdom, France	167,534
France, Hungary, Belgium	135,807
France, Slovakia	73,492
United Kingdom, France	71,777
United Kingdom, France	47,071
United Kingdom, France	45,651
United Kingdom, France	30,988
Czechia, Slovakia	26,036
United Kingdom, Czechia	4,547

Source: Authors

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