Can Regional Transfers Buy Public Support? Evidence from EU Structural Policy

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Abstract Regional transfers are assumed to have an impact on the public opinion towards the benefactor, but empirical evidence is still scarce. In this paper we test this hypothesis for the structural funds of the European Union (EU) by combining detailed data on regional transfers with public opinion surveys. A positive impact of transfers on public support for the EU can be confirmed. Moreover, we scrutinize the role of awareness of being a recipient of funds in this process. In particular, we find that the impact of the amount of transfers on the individual's awareness is heterogenous and particularly depends on education. Finally, we show that the information source which arouses the citizen's awareness of the transfers has an impact on his opinion.

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1 Introduction

Can politicians 'buy' the support of citizens by means of regional transfers? This is an important question when it comes to the relevance of many theoretical models focussing on the interaction of electoral incentives and public spending. The related theoretical literature implies that upper-tier governments might have an incentive to strategically allocate regional transfers in order to manipulate the electorate's opinion. But an essential element of this literature is the assumption that citizens in targeted regions automatically become aware of this intended benefit and that they reward the benefactor for it. Until now, this reaction of the citizens has not found much consideration in the empirical literature. In this paper, we focus on the regional policy of the European Union (EU) as a special case of a regional transfer policy with targeted benefits. In this policy area the European institutions, in particular the Commission, act as benefactor. In addition to reducing the economic disparities between European regions, which is the main objective of this policy, these institutions apparently also intend to increase the public support for European integration. Consequently, Begg (2008: 297) says "that the visibility of cohesion policy plays a valuable role in fostering support for EU regional policy and, indeed, the EU generally." In this paper, we study the effect of targeted transfers in the EU on the public support for the EU by combining a rich data set on the regional allocation of structural funds payments with opinion survey data. Our results confirm that regional transfers show this expected effect, and that it is sizeable: an increase of transfers by 100 Euros per capita increases the citizens' probability of being supportive of the EU by approximately 9% to 14%.

For several reasons, EU regional policy is a particularly interesting issue for the analysis of a popularity effect of regional transfers. Primarily, its scope is immense and much larger than the scope of most national programmes. In 2009, its budget amounted to almost 50 billion Euros, which was more than 0.4 % of the overall European GDP, and which was mainly dedicated to the poorest European regions. In addition to its pure size, it meets many requirements to be highly visible to the citizens. Many projects are financed that benefit a wide range of citizens, such as infrastructure, and since the European institutions are highly concerned with their public image, they actively promote the visibility of their regional activities. Concerning this objective, European institutions are not that different from upper-layer governments at the national level which act as benefactors of

regional transfers in order to obtain an electoral advantage. European institutions are the benefactors of EU structural funds and intend to get the citizens on their side in order to overcome obstacles for deeper integration and to solidify their position in the European federal system against national actors.

The study of this institutionally special case of regional transfers offers empirical advantages over the study of national systems of regional transfers. In particular, it alleviates methodological problems inherent to the analysis of the popularity effect of regional transfers in national federal systems. There, the allocation of transfers usually has to be regarded as endogenous since the benefactor has incentives to strategically favour certain regions. Contrary to this, the allocation of EU regional transfers can be regarded as exogenous as will be shown in this paper. In brief, most of the funds are allocated according to transparent criteria, and no relation between regional allocations and electoral motives can be expected.

Moreover, in this paper we use an innovative strategy for the measurement of the opinion of the citizens. In related works it is standard to measure the public support by means of voting equations, i.e., election results at the regional level. Obviously, for the EU this is hardly possible, since the EU is only irregularly the subject of elections, such as the referendums concerning the Constitution for Europe. In contrast to this, we refer to the direct statement of support for the EU in opinion surveys. This data source offers the advantage that it allows us to control for many further influences on the opinion at the individual level. In this regard, we can resort to a broad literature provided by political science which studies the determinants of the public opinion towards the EU.

Our empirical evidence will have important implications for the literature on vote buying: as the EU structural funds are larger in size and more visible to the citizens than most kinds of intergovernmental grants at the national level, we should expect a sizeable impact on the attitudes of the citizens in benefited European regions. Moreover, this is the first paper which is able to study the whole chain of causation which leads from regional transfers to public opinion in a more detailed way. In particular, we scrutinize the relevance of public awareness in this process. As will be shown in detail, it is too simplified to assume a simple and homogenous effect of local transfers on public support. In particular, the awareness of being supported is highly dependent on individual characteristics, such as education, and the information source that causes awareness has a major effect on the individual assessment.

The paper is structured as follows. In section 2, the theoretical literature and related empirical works focussing on vote purchasing at the national level are presented. In section 3, we motivate the application to EU regional policy and present institutional characteristics of EU regional policy. The data sources and our empirical approach are presented in section 4. In section 5, the results are presented and discussed, and the final section 6 concludes.

2 Theoretical background and related empirical work

A number of theoretical political economic models predict that in situations where upper-layer governments have leeway in the distribution of funds, a politically biased allocation to jurisdictions or social groups should take place, which comes under the term of 'vote purchasing'. One prediction is based on the theoretical framework originating from the seminal models by Lindbeck and Weibull (1987, 1993) and Dixit and Londregan (1996, 1998). Their main insights can be summarised as follows: office-seeking parties which are in power at the central level tend to use their leeway in the allocation of regional grants to benefit those jurisdictions in which the number of swing voters is relatively high. This increases the benefactor's share of votes, since the money spent in these regions yields a higher return of votes than money spent in other regions. Even more so, this kind of economic vote buying is assumed to play an important role in plurality voting systems. There, incumbents have an incentive to increase their probability of re-election by concentrating funds to those jurisdictions where a close election result can be expected (e.g., 'swing states' in US politics). Recent evidence that politicians at higher tiers of government invest excessively in those municipalities with a higher electoral benefit, e.g., because of the existence of many swing voters, comes from Dahlberg and Johansson (2002) and Johansson (2003) for intergovernmental grants in Sweden and Castells and Solé-Ollé (2005) for infrastructure investments in Spain, as well as Helland and Sørensen (2009) for Norwegian road investments.

An alternative prediction originates from the model of Cox and McCubbins (1986). Under the assumption that politicians are risk-averse, the model derives the expectation that incumbents excessively target funds towards their core supporters. Similarly, benefitting the core voters might also be vote maximizing since this improves turnout among the incumbent's core supporters (see Nichter (2008)). In a similar vein, Solé-Ollé and Sorribas-

Navarro (2008) argue that upper-layer decision-makers have an interest in benefitting jurisdictions which are governed by the same government, since only then the benefactor is able to gain the whole credit for the grant. Recent research finds some empirical evidence for these predictions: Leigh (2008) shows for Australia that jurisdictions held by the governing coalition received a larger share of discretionary funding, and Ansolabehere and Snyder (2006) provide similar evidence for transfers of U.S. states to counties. Solé-Ollé and Sorribas-Navarro (2008) show for Spanish municipalities that aligned municipalities receive more intergovernmental grants. Finally, Arulampalam et al. (2009) find evidence that for transfers from the Indian central government to states both mechanisms are at work: transfers increase both with alignment and with being a swing state.

However, while this empirical evidence confirms the expectations of a link existing between the allocation of regional transfers and the expected political gains for the incumbent, this is not sufficient evidence for the effectiveness of vote purchasing since it does not consider the reaction of the voters. As Stein and Bickers (1994) note, three conditions have to be fulfilled to establish a causal chain which runs from the expected gains from strategically targeting funds to an actual increase in the incumbent's vote share at the ballot box: (i) legislators can impact the distribution of funds, (ii) constituents in the districts become aware of these benefits, and (iii) constituents reward the benefactor for the benefits. Consequently, in order to complete the story, the reaction of the voters has to be considered. However, in this regard the existing literature is limited, and the very few existing works only rely on studying the overall effect of spending allocations on election results. Hence, these papers abstract from public awareness of the benefits and study the effect of fund allocation on public awareness and support jointly. Evidence comes from Levitt and Snyder (1997) who show for the members of U.S. Congress that an increase in spending at the district level by 100 Dollar per capita increases the incumbents' votes by 2%. Moreover, Solé-Ollé and Sorribas-Navarro (2008) show for Spanish municipalities that only grants to jurisdictions held by the same party as the central level can generate a positive effect at elections. They estimate a quantitatively similar effect. Only the early work by Stein and Bickers (1994) refers explicitly to the public awareness of fund allocation and shows that the awareness of being funded impacts on public support in elections of the U.S. Congress.

Such analyses of the voters' reaction at the ballot box confronts the researcher with a number of serious empirical problems: as discussed above, theory and evidence suggest

that politicians have strong incentives to bias the distribution of funds due to electoral motives, so that the allocation to jurisdictions cannot be regarded as exogenous. Moreover, it can be assumed that incumbents also influence the opinions of the electorate in the supported regions in other ways due to the high electoral returns they can expect from these jurisdictions. This might be more intensive campaigning in pivotal jurisdictions, which would lead to an omitted variable bias in the regressions and, consequently to an overestimation of the impact of regional transfers. In the related works, these severe endogeneity problems are therefore tackled with more sophisticated empirical approaches. In the works by Levitt and Snyder (1997) and Solé-Ollé and Sorribas-Navarro (2008), this is done by applying an instrumental variable estimation, in which the intensity of transfers to municipalities is instrumented with the transfers to neighboring municipalities.

However, in light of this rather scarce evidence in favour of an effect of regional spending on the popularity of the benefactor, it can be concluded that there are good reasons to challenge the claim that targeted transfers necessarily impact public support. One decisive necessity for generating a positive effect is public awareness, so that voters know whether their municipality has or has not been granted. As these targeted transfers usually come about in the form of public investments (e.g., in public infrastructure), a low visibility towards the citizens might marginalise the impact on the electorate's opinion. Moreover, as Solé-Ollé and Sorribas-Navarro (2008) emphasise, a positive effect can only be expected in cases where the citizens can attribute the additional spending to the incumbent party, which is usually only the case when central government and the executing local government are ruled by the same party. Finally, an intended preferential treatment of a specific region might not be recognised as such by the respective electorate and instead perceived as a general extension of public activity for which the local voters have to pay with their tax spending. This could even have an adverse effect on the citizens' support. Consequently, it is of interest not only to study whether targeted spending affects the opinion of the citizens, but also scrutinize the components of the transmission process, i.e., to study the determinants of the awareness of the citizens, and to identify how the awareness of being supported actually translates into the individual's opinion. Since the existence of these two effects is a necessary condition for the working of the mechanism sketched above, this analysis is required to confirm the causality between regional transfers and the public opinion.

3 Background European Union

3.1 Political implications

In this paper, we transfer the analysis of the popularity effect of regional transfers from the national level to the supranational level, in particular to the EU regional policy. Our claim is that this regional policy has – despite obvious institutional differences – very similar implications with respect to the theory as presented above. This needs some clarifications.

Of major importance is the observation that the European institutions in Brussels, in particular the Commission, are highly interested in increasing the public support for European integration. In this regard, they resemble national upper-layer governments that intend to increase their public support in order to increase their votes at the ballot box. This claim is at the bottom of neofunctionalism, the most enduring grand theory of European integration (see Hix (2005)), which suggests that these European institutions are a major driving force for European integration and the expansion of power of European supranational institutions. Following this objective, European institutions have a major interest in striving for an increase of the public acceptance of European integration. Opposition by the general public has been one of the major drawbacks for the integration process in the past. This became manifest only recently in a number of negative referendums such as those concerning the the Constitution for Europe or the Treaty of Lisbon. Moreover, public support for the EU is an important prerequisite for a further centralization of policies at the European level. As Lubbers and Scheepers (2005) state, "(t)hough few countries have held referenda over which policies should be decided at the European level, it is easy to imagine that legitimating the European Union in the long run stands or falls on the extent to which the European population supports decision-making processes at this supranational level." Hence, increasing the European citizens' support for integration can be regarded as a crucial goal for the European institutions which should guide their actions to a certain degree, and which is, inter alia, promoted by the regional policy as will be discussed below.

In the related works discussed in section 2, public support is studied by means of vote equations. This means that the incumbents' vote shares at the subnational level are explained with the transfers of intergovernmental funds plus a number of region-specific control variables. Obviously, this approach is not feasible in our setting, since the EU

itself and the European integration process are only sporadically subject of elections, such as the constitution referendums. These are of minor usefulness for our purpose since they were only conducted in a limited number of countries and their outcomes were regularly overshadowed by political issues of the national level. Consequently, we choose a different path and measure public approval by means of opinion survey data.

As will become clear in the following subsections, this research design offers some major advantages over earlier approaches. First, the main problem of related studies – the endogeneity of the funds allocation – is not much of a problem in the case of the EU structural policies. These are allocated according to principles which are presented in the following. This allocation of European funds is exogenous in the sense that there is no relationship between the level of regional transfers and the European institutions' intention to manipulate the public support. Second, the quantity of EU structural spending is immense and the European institutions promote it actively, so that its analysis seems to be promising concerning the visibility by the people. Third, the use of survey data allows us to control for a multiplicity of further determinants of public opinion.

3.2 EU regional policy

The structural funds of the European Union (EU) constitute a large-scale regional policy. From 2007 until 2013, a total amount of about 350 billion Euro, corresponding to approximately 0.4% of the total EU GDP, will be allocated. Its purpose is to enhance cohesion and to reduce welfare disparities among the EU regions. Consequently, the bulk of this spending, about 80% of it, is allocated to the poorest European regions in order to promote their social or economic convergence.

The EU regional policy in its current form was founded in 1988, when most of the principles which have since then determined this policy area were defined, in particular the geographical concentration of the funds.[1] Before this, European regional policy was limited to single projects, and its scope was rather small. In 1988, the overall amount available to regional policy was for the first time defined in a multi-annual Community budget for the years 1989-1993. Since then, it has become custom to conduct regional policy over multi-annual programming periods, with the subsequent ones covering the periods 1994-1999 and 2000-2006. At the beginning of each programming period, the maximum

[1] More details on the history of EU regional policy can be found e.g. in European Commission (2008) or Allen (2005).

funds available to each region (*allocations*) are defined for the whole period according to specified criteria. Moreover, the spending priorities are stipulated for later concretion in regional programmes.[2]

For the purpose of structural policies, regions are defined according to the Nomenclature of Territorial Units for Statistics (NUTS) of Eurostat, the statistical office of the EU. The NUTS 2 level which comprises regions with a size of usually between 800,000 and 3 million inhabitants is of highest relevance for the conduct of regional policy.[3] In some cases the relevant regions match national administrative boundaries (such as the Länder in Germany or Comunidades Autónomas in Spain), whereas in other member states artificial regions are used, e.g., in the UK. Actual payments to regions are then made within the ceilings of the multi-annual framework, i.e., the commitments can be called up by the regions within a certain period. Regions can become eligible for transfers from different "objectives". In quantitative terms, the transfers to the Objective 1 regions (after 2007 renamed as *Convergence* objective) has always been the dominating objective. This objective is dedicated to promote the development of regions whose development is lagging behind; these are NUTS 2 regions with a GDP per capita of less than 75% of the EU average[4]. Such a region receives transfers which are approximately 10 times higher than the support a region receives which exceeds this threshold only marginally. Moreover, objectives targeting regions that are not eligible for objective 1 have always existed. These address regions that suffer from other structural problems, such as industrial decline, high unemployment or a location in the periphery.[5] This set of instruments contributes to a high variation in the per capita level of transfers which is allocated to the European regions, hence creating differences between and within countries. The resulting map of eligible regions for the programme period 1994-1999 can be found in Figure 1 in the appendix.

The large scale of EU regional policy has already motivated a lot of economic research, especially concerning the impact of structural spending on national and regional GDP growth performance. The results of these studies have sometimes been inconclusive in the past (see Mohl and Hagen (forthcoming) for an overview), but most recent evidence

[2]Detailed information on accepted programmes are available from the web page of DG Regio: http://ec.europa.eu/regional_policy/atlas2007/index_en.htm.

[3]An exception is Germany, where EU regional policy is conducted at the NUTS 1 level.

[4]The eligibility of a region for an objective is decided prior to the start of a programme period and stays constant over the whole period.

[5]There existed 5 further objectives in the period 1994-1999, and 2 from 2000-2006. For more details, see European Commission (2008).

by Becker et al. (2009) and Mohl and Hagen (2010) suggests that a significantly positive growth effect exists, in particular for Objective 1 spending. This finding is of high importance for our analysis, since it confirms that EU structural policy is indeed a *regional* policy with perceptible benefits for selected European regions, and it is not designed as a national transfer programme.

Another important aspect of EU regional policy for our purpose is the fact that it meets all demands to be very visible to the European citizens, probably much more than comparable national programmes. First, as mentioned above, the amounts allocated to the main beneficiary regions are very high and a major share contributes to the financing of large-scale projects within these regions such as infrastructure projects (like motorways or public transport) through the European Regional Development Fund (ERDF); further activities are environmental projects, direct aid to enterprises and human resources through the European Social Fund (ESF). Second, the Commission is aware of the capability of this policy area to improve the public opinion towards the European institutions and the citizens' support for European integration (see Begg (2008)), and therefore the responsible institutions actively promote the visibility of these funds. This activity is particularly motivated by the fact that structural spending is the only major spending category of the European budget which can reach broad levels of the population, while most other policies, such as agriculture policy, are focussed on small groups only.

This intended promotion of regional policy is fixed in the Commission's regulations and takes different forms. One important channel is the media. It is explicitly stated in the Council regulations that the managing authorities have to actively resort to the media in order to make the citizens aware of the support transfers they receive.[6] Moreover, regulations demand that investments which are funded by EU structural funds have to be labelled extensively with the symbols of the EU, both on construction signs as well as with emblems on the finished projects (see, e.g., European Commission (2000), European Commission (2006)). Consequently, the EU is omnipresent in the benefitting regions, with the symbol of the flag of Europe visible in all supported regions, ranging from public buses in Athens to wastebaskets in Santiago de Compostela.

[6]In Regulation No 1159/2000, it is stated that "in order to make the public more aware of the part played by the European Union in the assistance packages concerned and the results they achieve, the designated managing authority shall inform the media in the most appropriate way about the structural assistance part-financed by the Union. [...] Steps shall be taken, at the time of the original launch of assistance following approval by the Commission and of the main phases of implementation, to alert the national and regional media (press, radio and television) as appropriate; such steps may include press releases, the placing of articles, supplements in the most suitable newspapers and site visits."

3.3 Support for European Integration

For the measurement of public opinion, we will resort to the support for the EU and its institutions at the individual level as expressed in public opinion surveys. This approach differs from most of the related literature that measures aggregate public support at the subnational level by using election results. To our knowledge, Manacorda et al. (2009) is the only related paper that applies a similar survey-based approach, but their work has its focus on personal transfers instead of regional transfer. They study the causal effect of government transfers on the political support for the incumbent party in Uruguay within a large anti-poverty program that comprises conditional transfers to poor households.[7]

The use of survey data offers several advantages over the use of vote equations. Election results only give an crude picture of the public opinion since election results are only available for individual jurisdictions at an aggregate level. In vote equations many further determinants of electoral outcomes are unobservable or have to be appraised, such as the ideological positions or other socio-economic characteristics of the inhabitants of a municipality. In contrast to this, survey data allows to control for many of these variables by means of the individual characteristics that are available from the respondents. Moreover, the usually higher availability of public opinion polls provides more observations than votes which are only conducted irregularly and may be influenced by campaigning activities. Finally, direct statements of public support in surveys exclude the possibility that strategic voting motives might interfere with the "true" opinion of the citizens.

Concerning the public support for the European Union, a voluminous literature from political science already exists which has mainly been published on the basis of Eurobarometer survey data. From these studies, much is known about further determinants of citizens' attitudes towards European integration which will enter our analysis as control variables. This facilitates us to isolate the pure effect of the intensity of structural funds spending on the citizens' support from a variety of other influences. Hooghe and Marks (2005) give an overview of the different theoretical approaches and empirical findings which they classify into three groups: (i) economic models, (ii) identity and (iii) political cues. Obviously, our approach has to be classified into the group of *economic models* which explain the people's support by the benefits they derive from European

[7] In particular, approval for the current government (surveyed in the Latinobarómetro public opinion) is explained by the estimated household income, thereby using a discontinuity in the income which determines the eligibility for the program.

integration. Important examples for further related factors are education, occupation and personal income, since mainly citizens with a high level of human capital can be regarded as beneficiaries from market integration in Europe. National benefits of integration mainly accrue from a high degree of intra-EU openness. Moreover, some papers add national net positions as regressor to control for budgetary benefits from the EU budget. However, this data is not very illustrative for our purpose, since the national net position is inter alia determined by the average of structural funds transfers and the data itself is usually regarded as a bad proxy for economic benefits in the literature (see LeCacheux (2005) for a criticism of this indicator). The other main determinant of net positions is the amount of agricultural subsidies which, however, only benefit farmers. We control for this effect in our regressions. The financing of these gross transfers does not impact the net positions (which are commonly expressed as national share of GDP) significantly. Financing takes place from the pool of EU revenues which are raised from the national budgets in form of contributions. These are roughly proportional to their overall GNI and VAT revenues, so that all countries contribute according to the size of their economy (see Heinemann et al. (2008) for an overview). Consequently, the economic implication at the aggregate level is similar to that of a tax on GDP, but the individual incidence additionally depends on the characteristics of the national tax system which finances the contributions to the EU.[8] *Identity* comprises aspects related to group loyalty (such as nationalism or multiculturalism). It is relevant since European integration interferes with national sovereignty. One important aspect is the socialization of citizens with the EU, which is usually found to increase with the length of membership. Finally, *cue theory* emphasizes the importance of individual interests and values. These comprise, inter alia, the ideological position of the individuals or their post-materialist attitudes, which are usually proxied by their age (see Hix (2005) for a more detailed overview of the literature).

Most of the existing empirical literature focusses on determinants of EU support at the individual and the national level. We extend these existing approaches by adding a number of regional control variables to our variable of main interest which is also measured at the regional level. Lubbers and Scheepers (2005) show that EU support varies significantly across the regions within the European countries. Consequently, controls at the regional level are necessary since we have to rule out that other region-specific factors interfere

[8]This impact on the individual cost-benefit analysis is captured in our regressions as far as possible by the inclusion of individual income as well as other economic control variables.

with the impact of the regional intensity of support. In the following empirical section, the control variables will be presented in detail. These are derived from the three different approaches given above and follow the variables that are usually applied in the related political science literature as far as possible.[9]

4 Data and empirical approach

4.1 Data

The data for EU structural funds payments at the regional level has been generated from the *Annual Report on the Structural Funds* published by the European Commission. In these reports, spending is recorded according to regional programmes, which allows the calculation of overall transfers at the regional level. However, the data available is very limited, which restricts the scope of our analysis to the programme period 1994-1999. Since 2000, payments are not published in Commission publications anymore, so that this is the only period where the amount of funds spent in the regions is reliably available on an annual basis. For the period at hand we can use a detailed annual data base.[10] This goes far beyond the data which is usually applied in the growth literature, which is often only the overall payments in the whole programme period. Moreover, many works apply the amount of commitments to the regions instead of the payment figures. Commitments are the maximum amount available which can be called up by the national authorities. These are, however, inappropriate for our analysis, since these are usually only spent in the region at a indeterminate point in time some years after they have been committed. Moreover, in many cases commitments are not paid at all, since they are only available for a period of 2 years and expire after that period (N+2 rule).

We apply the data in form of the annual regional transfers at a per capita base; the descriptive statistics are presented in Table 5 in the appendix. As can be expected from the allocation principles presented above, these per capita transfers vary a lot between, but also within countries. The highest average per capita levels can be found for the countries which are entirely eligible for Objective 1, i.e., Ireland, Portugal and Greece. These are up to 10 times higher than those of countries without any Objective 1 regions. The highest

[9]Note that some variables, mainly concerning identity, cannot be included due to lack of availability for our sample.

[10]More detailed information on the data can be found in Mohl and Hagen (2010).

within variation can be found for Spain, Germany and Italy. These are countries that consist of both rather poor and very rich regions. Note that even single regions in many rich countries, such as Austria or the Netherlands, exhibit a very high level of transfers. In detail, the average per capita transfer for Objective 1 regions amounts to 148.24 Euros, for the other regions this average only amounts to 16.75 Euros.

The public attitude towards the EU is measured with survey data from the Eurobarometer opinion survey. This has been conducted since 1973 on behalf of the European Commission for a representative sample in all member states (usually about 1,000 participants per country and edition) and performed at least twice a year. Although the composition of questions changes continuously over time, some questions appear regularly in the questionnaires. In particular, we refer to the following question as indicator for public support of the EU: *"Generally speaking, do you think that your country's membership of the European Union is a good thing, bad thing or neither good nor bad?"*. The possible answers are coded as follows: 1 for a 'good thing', 2 for 'neither good nor bad', 3 for a 'bad thing'. This scale is, thus, ordinal, and for illustrative reasons we rescale it so that the values increase with increasing support for the EU (consequently, 1 denotes 'a bad thing', and 3 'a good thing'). For our estimations, we refer to all editions of the Eurobarometer survey between 1995 (EB 43.0) and 1999 (EB 52.1) which contain this question.[11] The graphic representation in Figure 2 in the appendix shows that the respondents tended to have a positive attitude towards the EU, with a mean of 2.4. For each respondent, his regional origin is recorded in the data sample at a subnational level, which can in most case be traced back to NUTS 2 level or an even lower level. After merging the data on structural funds transfers and the Eurobarometer surveys at the same geographical level, it is possible to attribute each individual participant's stated opinion to the transfers spent in his region (expressed in Euros per capita).

In addition to that, we will later refer supplementary to the Eurobarometer issue 43.1bis from 1995. This was a special issue of Eurobarometer which additionally contained some further questions related to the regional policy of the EU. By means of these questions which will be presented at the respective position of the empirical section, we are able to extend the analyses that are conducted based on the large sample by adding further questions focussing on the respondents' awareness of regional policy.

Finally, a number of control variables are used which are listed in Table 6 in the appendix.

[11] The data has been obtained from the Mannheim Eurobarometer Trendfile.

These are available at three different levels: (i) individual, (ii) regional and (iii) national. First, in addition to the dependent variable, a number of socio-economic controls are provided by the Eurobarometer survey, comprising aspects such as age, gender, education, employment status and income. The variable *rural* is measured at the individual level since it is based on the self-assessment of the respondents concerning their home town and takes the value of 1 if this is characterized as rural. Moreover, individuals are asked to locate themselves on an ideology scale ranging from +1 (left) to +10 (right). In order to account for extreme positions, we added the variable *Ideology Extreme*, which yields the absolute deviation of the *Ideology* value from a centrist position (5.5). Second, most of the further controls are available at the regional level. These are mainly derived from the Cambridge Economics Database and detect further region specific characteristics that might impact on the attitude towards the EU. The dummy for regions that share a border with another member state (*border*) and the *centrality* index address region-specific benefits from European integration through trade. The latter is based on the regional typology of the ESPON (European Spatial Planning Observation Network) data set (ESPON (2005)) which characterizes the regions from 0 (very peripheral) to +5 (very central).[12] Third, the share of intra-EU trade is only available at the national level, which is also an important proxy for national benefits from integration. Finally, the literature has shown that the duration of EU membership has to be considered as further important determinant of the public support.

4.2 Discussion of potential endogeneity

The study of the causal effect of regional transfers on elections generally suffers from severe methodological problems which we discussed in the literature overview in greater detail. The allocation of funds to regions cannot be regarded as exogenous in cases where politicians use them in order to manipulate the electorate's opinion. In the case of EU regional policy, this problem is of minor importance. Although the European institutions are highly interested in increasing the overall public support of the citizens, this does not imply that they are interested in excessively benefitting single regions. Moreover, this would not be possible, since the bulk of the funds is allocated according to rules based on objective figures, such as the 75% threshold. The distribution of funds within

[12]In particular, it is based on a time based, multimodal accessibility-indicator, calculated for the year 2001. It can be regarded as an indicator of the size of market areas for suppliers of high-level business services. See Vickerman, Spiekermann, and Wegener (1999) for the methodology.

countries is furthermore partly managed by national authorities, which can neither be assumed to be biased by the support of the citizens for the EU in their decisions. The exogeneity of funds allocation with respect to the attitude of the citizens towards the EU is moreover documented by Bouvet and Dall'erba (2010), who study the determinants of the structural funds allocation. According to this work, EU scepticism is not found to significantly affect the national allocation of funds. Concerning the regional allocation, the distribution of Objective 1 spending, and thus the bulk of structural funds, as well as the distribution of Objective 5 spending are neither found to be affected by the attitude of the citizens' towards the EU. The effects for the further smaller categories, Objective 2 and 3&4 spending, are significant but contradictory, since they point to different directions. However, in both cases the quantitative effect on the funds allocation is negligible, and other economic and political factors are found to have a much stronger effect on the allocation.[13] Consequently, our research design offers the advantage that we can treat the allocation of funds to regions as exogenous with respect to the level of EU support.

However, the dominance of the allocation criteria gives rise to concerns that an omitted variable problem might be existent, since structural funds are to a large extent allocated based on data on the regional prosperity, which is measured as GDP per capita. Although the existing theoretical and empirical literature on EU support does not consider a direct causal impact of regional prosperity on the public opinion, we take this problem seriously in our empirical approach. First, we control for personal income, as well as for the personal economic situation (profession, unemployment status) of the respondents. Second, we control for regional characteristics which affect prosperity and might be assumed to affect public opinion directly (e.g., unemployment rate, industrial structure or peripheral location).

Nevertheless, there are arguments which militate against the existence of a major problem due to omitted variables. Annual regional policy payments are not as highly correlated with regional prosperity as it appears at first glance. The allocation of funds is determined several years before the beginning of the multi-annual programme period, and based on regional GDP figures which are also only available with the delay of several years. Consequently, the regional GDP figures which underly the regional allocation of funds at a

[13]Bouvet and Dall'erba (2010) as well as Bodenstein and Kemmerling (2008) find that the economic criteria explain most of the variation in allocated tunds, but they also find weak evidence that political factors, such as electoral competition in the regions, impact the distribution at the subnational level. This finding, however, mainly affects the distribution of the small fraction of Objective 2 funds, and does not have a relation to the EU support in the regions.

given point of time can have an age of up to 15 years (see Mohl and Hagen (forthcoming)). This procedure has regularly led to perverse outcomes, most notably in the case of Ireland. Ireland was the biggest recipient of transfers in per capita terms in the time which is considered in the paper (as demonstrated in Table 5) although in 1999 it already belonged to the richest countries in Europe, with a GDP per capita at level of 110% of the EU-15 average.

Finally, even if there was an omitted variable problem in our regressions, this would rather dampen the impact of regional policy spending. The political science literature cited above stresses that mainly richer and well-educated citizens tend to support the EU, and that mainly citizens from regions with higher openness perceive a benefit from European integration. These regions are, however, almost exclusively located in Europe's core and belong to the richest regions, and thus do not receive high transfers from Brussels. Consequently, a potential omitted variable problem would lead to an underestimation of the effect of transfers on public support, so that our results can be regarded as rather conservative.

Likewise important is to discuss a potential bias which could arise if the perceived or expected national gains generated by different aspects of European integration were correlated with the national prosperity. At the stage of integration that will be regarded, which is the end of the 1990s, this mainly affected economic integration. Consequently, a first glance at the national attitudes towards liberalization in general should be helpful. Figure 3 in the appendix shows the correlation of the member states level of GDP per capita and the impact on the personal financial situation that is expected by the citizens.[14] This correlation is slightly positive, which indicates that the citizens in the richer countries tended to have a more positive attitude towards the effect of liberalization than those in poorer countries.

This finding is also in line with the political science literature that discusses a "compensatory" function of the EU budget (see, e.g., Carrubba (1997) and Axt (2000)). Accordingly, the major expansions of the EU regional and cohesion funds in the 1990s can be explained by the intention to compensate the "losers" of integration, as which the poorer member states at that time were considered, in order to abstain from a veto against further integration steps such as the Internal market or EMU which were propagated by the

[14]We use data from Eurobarometer 55.1 from 2001 which is shortly after the end of our period of study. Unfortunately, attitudes towards liberalization and related issues were not inserted in the Eurobarometer survey before that issue.

pro-integrationist central European (and richer) member states.[15] This again indicates that a possible omitted variable problem would rather deflate our results, and we will return to this issue after presenting the results in section 5.1.

4.3 Empirical method

The data subsection has shown that the data which is used has a hierarchical structure, since it comprises information from three different levels. Consequently, individuals i from the same region r or country c share common influences when the individual level of EU support is explained in our regressions. This can be seen from equation 1 which represents the basic model as a latent response model.

$$y^*_{irc,t} = \beta_1 + \beta_2 RegionalPayments_{rc,t} + X^1_{irc,t}\beta_3 + X^2_{rc,t}\beta_4 + X^3_{c,t}\beta_5 + \mu_t + \eta_c + \epsilon_{irc,t} \quad (1)$$

$X^1_{irc,t}$, $X^2_{rc,t}$ and $X^3_{c,t}$ are sets of covariates that are available at the individual, regional and national level, respectively. The variable of our main interest is $RegionalPayments_{rc,t}$, which is the intensity of regional policy payments a region r of country c receives in year t. Hence, an individual i who was surveyed in year t gets the value of the per capita payments in his region of that year.[16] Moreover, since the respondents were surveyed at different points of time, the model contains a set of year dummies, μ_t, which capture time trends in EU support. A set of location dummies η_c is added in some regressions that control for country-specific influences which can not be captured by the region and country-specific controls, but we will later also present an alternative model that allows us to study within-country and between-country effects more explicitly. $\epsilon_{irc,t}$ is the individual error component.

The simple estimation of this model with the dependent variable measured at the individual level and explanatory variables mainly available at a higher level would suffer from econometric problems, since the assumption of independent observations (and independent errors) is violated because observations are "duplicated" (see, e.g., Steenbergen and

[15] For instance, Molle (2007):142 states that in 1993 "(t)he fear of the southern member states to lose out under the influence of the creation of the Monetary Union has been taken away by a package deal that increased the size of the SF [structural funds]".

[16] Note that this structure implicitly allows for a lag in the effect of transfers on public support, since the payments in our data are recorded towards the completion of a project. There is a lag in the EU statistics to the commitments which are already recorded some time (usually several years) earlier at the point of time when the project is decided and the implementation starts. Consequently, even before t the projects are visible to the citizens.

Jones (2002)). As a consequence, the application of OLS or probit without a correction underestimates the standard errors and inflates the test statistics. In this paper, we will compute robust standard errors which correct for potential correlation of the error term across observations that are contained within the same cross-sectional unit (i.e., the same NUTS 2 region).[17]

Depending on the survey question which is examined, the model is either estimated by probit analysis (for questions with bivariate answer categories) or by ordered probit analysis (for questions with ranked answer options).

5 Empirical results

In this section the empirical results will be presented. In the first subsection, we study the overall impact of the regional transfers on public support for the EU by using the complete data sample presented above. In the second subsection, we restrict to a fraction of this data sample that comprises a special issue of the Euobarometer survey. This provides more detailed information, and we can carry out more detailed analyses. These allow us to study the different steps of our chain of causality individually so that we can study the causality of the relationship between transfers and public opinion.

5.1 Effect of transfers on EU support

We start with the presentation of the estimation of equation 1 as a pooled model that contains all control variables presented in section 3 (column 1 of table 1) as well as year dummies. The variable of main interest is the per capita level of regional policy payments spent in a certain region. This variable shows a positive effect on the individual support for the EU, which is statistically significant and quantitatively sizeable as indicated by the marginal effects: an increase of per capita transfers by 100 Euro increases the probability of being supportive of the EU to the extent of 13% (the marginal effects are in all cases reported for the highest answer category which is 3, and which represents a positive opinion on the EU). Moreover, a number of control variables are highly significant in this model – as well as in the subsequent regressions. These results are well in line with the

[17] See Arceneaux and Nickerson (2009) for an overview on the different methods that allow for clustering of error terms. They show analytically and empirically that if the number of clusters is above 20 (as it is in this case), clustered standard errors are equally adequate for precision estimates of group-level effects than hierarchical linear models or random effects models.

predictions of the existing political science literature from. In particular, a higher degree of education as well as higher income exhibit a positive impact on EU support. Ideology shows an inverse U-curve effect, with the strongest support given by people who locate themselves at the centre of the political spectrum. The coefficients for the dummies for professions also show the expected directions, but one effect is of particular interest in our context: farmers show a significantly lower support for the EU. However, this population group is the main recipient of EU transfers through the Common Agriculture Policy, but obviously it is not possible to disentangle the transfer effect from personal characteristics specific to farmers, as well as their negative attitude towards a perceived overregulation of agricultural markets. Finally, the benefits for trade seem to be important, and people from countries with a longer membership are more supportive.

In column 2, we add country dummies to the regression. This has an effect on the impact of regional policy transfers: this variable still exhibits a significant positive effect on the support, but the quantitative impact declines a lot compared to the previous approach. This observation deserves further investigation: in Figure 4 in the appendix we plot the estimated coefficients for the country dummies against the averaged national transfers. Visual inspection indicates that great proportion of the size of the country fixed effects can be explained by the national differences in received transfers. This effect of the national support level is partially absorbed by the use of country dummies, in particular in those countries which only consist of one region (such as Ireland or Luxembourg). Consequently, this approach doesn't seem to be meaningful when we want to inspect the overall effects of EU regional transfers.

Table 1: **Regression results: support for EU membership – ordered probit**

	(1)		(2)		(3)	
Variable	coeff.	marg. effect	coeff.	marg. effect	coeff.	marg. effect
Regional Payments$_{rc,t}$	0.0033***	0.0013	0.0009**	0.0003	–	–
	(0.0004)		(0.0004)			
Regional Payments$_{rc,t}$	–	–	–	–	0.0023***	0.0009
-National Payments$_{c,t}$					(0.0006)	
National Payments$_{c,t}$	–	–	–	–	0.0035***	0.0014
					(0.0004)	
Male	0.130***	0.051	0.127***	0.050	0.129***	0.051
	(0.020)		(0.021)		(0.020)	
Age	-0.0178***	-0.007	-0.015***	-0.006	-0.017***	-0.007
	(0.004)		(0.005)		(0.004)	
Ideology	0.032**	0.012	0.034**	0.013	0.031**	0.012
	(0.014)		(0.015)		(0.014)	
Ideology extreme	-0.023***	-0.009	-0.024***	-0.009	-0.024***	-0.009
	(0.007)		(0.008)		(0.007)	
Income	0.081***	0.032	0.078***	0.031	0.079***	0.031
	(0.005)		(0.004)		(0.005)	
Education: high	0.298***	0.115	0.334***	0.129	0.310***	0.120
	(0.043)		(0.022)		(0.040)	
Education: medium	0.106***	0.042	0.122***	0.048	0.116***	0.046
	(0.017)		(0.013)		(0.015)	
Education: study	0.364***	0.138	0.386***	0.145	0.373***	0.141
	(0.035)		(0.022)		(0.033)	
Profession: farmer	-0.189**	-0.075	-0.199**	-0.079	-0.191**	-0.076
	(0.088)		(0.098)		0.088	
Profession: manual	-0.146***	-0.058	-0.115***	-0.045	-0.144***	-0.057
	(0.020)		(0.017)		(0.019)	
Profession: professional	0.169***	0.065	0.144***	0.056	0.168***	0.065
	(0.029)		(0.028)		(0.029)	
Profession: executive	0.230***	0.088	0.242***	0.093	0.235***	0.09
	(0.041)		(0.036)		(0.041)	
Profession: unemployed	-0.123***	-0.049	-0.111***	-0.044	-0.118***	-0.047
	(0.020)		(0.016)		(0.021)	
Profession: retired	-0.013	-0.005	-0.001	-0.001	-0.009	-0.004
	(0.014)		(0.011)		(0.0142)	
Rural	-0.066**	-0.026	-0.058**	-0.023	-0.064**	-0.025
	(0.030)		(0.023)		(0.030)	
Unemployment rate	-0.001	-0.000	-0.009***	-0.003	0.002	0.001
	(0.004)		(0.003)		(0.004)	
Share agriculture	0.748**	0.295	0.220	0.087	0.623**	0.245
	(0.251)		(0.192)		(0.291)	
Share services	0.513	0.202	0.389*	0.153	0.410	0.162
	(0.402)		(0.230)		(0.433)	
Density	-0.012	-0.005	0.001	0.000	-0.016	-0.006
	(0.033)		(0.021)		(0.034)	
Border	0.000	0.000	0.057	0.023	-0.007	-0.003
	(0.069)		(0.038)		(0.068)	
Centrality	0.070	0.028	0.038	0.015	0.075	0.029
	(0.053)		(0.026)		(0.052)	
Intra-EU Trade	0.770**	0.303	-0.721	-0.284	0.824**	0.324
	(0.360)		(0.708)		(0.358)	
Years of Membership	0.017***	0.007	0.000	0.000	0.016***	0.006
	(0.002)		(0.002)		(0.002)	
year dummies	yes		yes		yes	
country dummies	no		yes		no	
N	141,356		141,356		141,356	
Prob > chi2	0.000		0.000		0.000	

Robust standard errors allowing for clustering at the regional level in parentheses: * Significant at the 10% level. ** Significant at the 5% level. *** Significant at the 1% level. Marginal effects are calculated for answer class 1 (membership in the EU is a good think).

In the following, we propose a different approach which allows us to disentangle the between country from the within country effect of the regional policy transfer variable. In column 3, the per capita structural funds payments at the regional level ($RegionalPayments_{rc,t}$ in column 1 & 2) are decomposed into the national per capita payments $NationalPayments_{c,t}$ (which is the population-weighted average per capita transfer to all regions within a country) and the deviation of the regional from the national level of transfers, $RegionalPayments_{rc,t} - NationalPayments_{c,t}$. The latter term is greater than zero for regions which receive higher per capita payments than the national average, and smaller otherwise. Consequently, the first term represents the between-country effect of structural funds payments, and the second term the within country-effect. These two effects are due to their construction practically uncorrelated. If it is assumed that both effects are equal (which is usually done in fixed effects analysis), both coefficients should have the same value (see Rabe-Hesketh and Skrondal (2008) for this approach). This decomposition leads to the following new representation of equation (1):

$$\begin{aligned} y^*_{irc,t} &= \beta_1 + \beta_2 NationalPayments_{c,t} + \beta_3(RegionalPayments_{rc,t} \\ &\quad - NationalPayments_{c,t}) + X^1_{irc,t}\beta_4 + X^2_{rc,t}\beta_5 + X^3_{c,t}\beta_6 + \mu_t + \epsilon_{irc,t} \end{aligned} \tag{2}$$

The results in column 3 indicate that the between country effect is significantly higher than the within country effect (p-value: 0.052). An extra (per capita) Euro paid to each region of a country (between country effect) generates a higher popularity effect than one extra (per capita) Euro paid to the respondent's home region (within country effect). The smaller within effect relative to the between effect corresponds to the lower impact of transfer intensity in the regression that applies country dummies. This observation allows two different explanations. Empirically, one might argue that the initial regression suffers from an omitted variables problem, since an unobservable effect interferes with the average national level of transfers, and which also impacts average national support for the EU directly. However, given the battery of control variables as well as the fact that the related political science literature dismisses such an effect (and usually estimates without using country dummies), we prefer an economic explanation. It it very plausible that the impact of transfers on public opinion does not only depend on the level of regional benefits, but the level of overall benefits that the other regions of the home country receive seems to play a role as well. This can be explained by the fact that nationwide media or

politicians tend to focus on national benefits, and these figures are reported widely when discussing EU policies. Consequently, one may conjecture that structural funds spent in other regions of a country spill over on the public opinion. However, the results also confirm that the regional differences in transfers within a country are still important to explain the EU support of the individual citizens. This is demonstrated by the positive coefficient of the within effect. Quantitatively this result indicates that a citizen who lives in a region that receives per capita transfers that are 100 Euro higher than the national average has a higher probability of being supportive of the EU which amounts to 9%.
Coming back to the discussion of potential omitted variable problems in section 4.2, some further conclusions can be made based on the results. The variables that proxy further national benefits from European integration, such as intra-EU trade and years of membership, both indicate that, ceteris paribus, citizens in the old and already well integrated countries tended to have a higher opinion of the EU. Moreover, the fact that the within country effect is significant and sizeable also contradicts the presumption that the positive effect of regional transfers on the citizens' attitudes is mainly driven by further unobservable national benefits from integration. In the following subsection, we will focus on the causality which is implied by the assumed mechanism. If differences in the individual levels of EU support are in fact caused by different intensities of regional transfers, the two following effects have to measurable: (i) a positive effect of the regional level of transfers on the individual probability of being aware of being supported, and (ii) a positive effect of being aware of being supported on the individual support for the EU.

5.2 Studying the awareness of the citizens

Until now, we have only studied the overall impact of targeted funds on public support in the EU and abstracted from the role of public awareness of being supported in this process. In contrast to earlier papers, our data allows us to scrutinize the relevance of the awareness of the European citizens concerning the impact of regional policy on public support. In Eurobarometer 43.1bis from 1995, some additional questions concerning the degree of information with respect to regional policy were asked. In particular, we refer to the following question (Q41): *"The European Union has, among others, a regional development fund (the ERDF) to give aid to less favoured regions in the European Union. Have you become aware of the activities of this European Union Regional Fund (the ERDF) in (OUR COUNTRY) ?"*, which offered the answer options of yes (1 in the following) and no

(0). A positive answer was given by 32.6% of the respondents, a negative one by 67.4%.[18] First, we study the individual determinants of being aware of being supported by the EU. In table 2, we show the regression results for this question, applying the same empirical model as used in the preceding subsection. Of particular interest is again the regional transfer intensity (column 1), which is also decomposed in between country and within country effect as before (column 2). Both effects are significant, and the t-test for equal coefficients cannot be rejected at conventional significance levels (p-value: 0.72). The quantitative effects are quite substantial: an increase of the per capita spending of structural funds by an amount of 100 Euros increases the probability of being aware of being supported by regional policy by about 13%. This indicates that the visibility of EU regional policy indeed increases with the amount which is spent within a region. However, a number of further socio-economic characteristics seem to impact this visibility as well, and these particularly refer to the educational background. This is not a very surprising result, as it may be assumed that higher educated people are better informed about EU policies, notwithstanding the amount spent in the respective jurisdiction.

In column 3, we take a closer look at the effect of education on the awareness of being supported by the EU. We interact the education dummies with the regional aid intensity and find that the responsiveness of the individual's awareness to the aid intensity increases with the level of education (it is highest for the group of highly educated people, and lowest for the least educated). From this an interesting conclusion can be drawn: the individual's awareness of being a beneficiary of EU structural funds generally increases with the aid intensity, but this effect is highly heterogenous and crucially depends on his education level.

Table 2: **Regression results: awareness of EU support – probit**

	(1)		(2)		(3)	
Variable	**Coeff.**	**Marg. eff.**	**Coeff.**	**Marg. eff.**	**Coeff.**	**Marg. eff.**
Regional Payments$_{rc,t}$	0.0037***	0.0013	–	–	0.0024***	0.0086
	(0.0005)				(0.00067)	
Regional Payments$_{rc,t}$	–	–	0.0041***	0.0015	–	–
-National Payments$_{c,t}$			(0.0011)			
National Payments$_{c,t}$	–	–	0.0037***	0.0013	–	–
			(0.0006)			
Regional Payments$_{rc,t}$	–	–	–	–	0.0036***	0.0013
× Education: high					(0.0006)	
Regional Payments$_{rc,t}$	–	–	–	–	0.0015**	0.0005
× Education: medium					(0.0007)	
Regional Payments$_{rc,t}$	–	–	–	–	0.0021**	0.0007

[18]Note that these values are unweighted for country sizes, and thus not representative averages.

	(1)		(2)		(3)	
Variable	**Coeff.**	**Marg. eff.**	**Coeff.**	**Marg. eff.**	**Coeff.**	**Marg. eff.**
× Education: study					(0.0010)	
Male	0.326***	0.116	0.326***	0.116	0.327***	0.116
	(0.036)		(0.036)		(0.036)	
Age	0.067***	0.024	0.067***	0.024	0.068***	0.024
	(0.013)		(0.013)		(0.013)	
Ideology	-0.009	-0.003	-0.009	-0.003	-0.008	-0.003
	(0.008)		(0.008)		(0.008)	
Ideology extreme	0.009	0.003	0.009	0.003	0.010	0.004
	(0.013)		(0.013)		(0.013)	
Income	0.105***	0.038	0.106***	0.038	0.104***	0.037
	(0.015)		(0.015)		(0.015)	
Education: high	0.394***	0.145	0.391***	0.144	0.216***	0.079
	(0.054)		(0.053)		(0.062)	
Education: medium	0.197***	0.071	0.195***	0.070	0.093*	0.033
	(0.045)		(0.044)		(0.049)	
Education: study	0.248***	0.092	0.246***	0.091	0.117	0.043
	(0.067)		(0.066)		(0.082)	
Profession: farmer	0.061	0.022	0.062	0.022	0.086	0.031
	(0.111)		(0.109)		(0.109)	
Profession: manual	-0.051	-0.018	-0.052	-0.018	-0.051	-0.018
	(0.049)		(0.049)		(0.049)	
Profession: professional	0.047	0.017	0.047	0.017	0.037	0.013
	(0.089)		(0.089)		(0.088)	
Profession: executive	0.173*	0.064	0.173*	0.064	0.177**	0.066
	(0.089)		(0.089)		(0.090)	
Profession: unemployed	0.030	0.011	0.028	0.010	0.031	0.011
	(0.066)		(0.065)		(0.066)	
Profession: retired	-0.109**	-0.038	-0.109**	-0.038	-0.122**	-0.043
	(0.051)		(0.051)		(0.052)	
Rural	-0.056	-0.020	-0.057	-0.020	-0.060	-0.021
	(0.041)		(0.040)		(0.041)	
Unemployment rate	-0.018***	-0.006	-0.018***	-0.006	-0.019***	-0.007
	(0.004)		(0.004)		(0.004)	
Share agriculture	-1.570***	-0.560	-1.548***	-0.553	-1.646***	-0.588
	(0.444)		(0.462)		(0.469)	
Share services	0.726*	0.259	0.746*	0.266	0.805*	0.287
	(0.441)		(0.442)		(0.443)	
Density	0.093***	0.033	0.093***	0.033	0.097***	0.035
	(0.026)		(0.026)		(0.026)	
Border	0.053	0.019	0.054	0.019	0.069	0.025
	(0.055)		(0.054)		(0.054)	
Centrality	-0.083	-0.030	-0.083	-0.030	-0.089*	-0.032
	(0.054)		(0.054)		(0.054)	
Years of Membership	-0.002	-0.001	-0.002	-0.001	-0.002	-0.001
	(0.002)		(0.002)		(0.002)	
Constant	-1.260***		-1.263***		-1.172***	
	(0.279)		(0.278)		(0.280)	
N	10,266		10,266			
Prob > chi2	0.000		0.000			

Robust standard errors allowing for clustering at the regional level in parentheses: * Significant at the 10% level. ** Significant at the 5% level. *** Significant at the 1% level.

In the second step, we want to study whether this stated awareness of the citizen of being a beneficiary of transfers actually leads to an increase of his EU support. In column 1 of table 4, we build on the baseline estimation from section 5.2 and replace the regional payments with the survey data for the individual's awareness of being supported by EU

regional funds. The dummy takes the value of one in cases where the respondent is aware of EU regional policy support in his country. The dummy shows the predicted positive sign at the 5% significance level: the awareness of being funded by EU regional policy increases the probability of a positive attitude towards the EU by about 4%. This verifies the existence of the mechanism sketched above: the regional aid intensity positively affects the citizens awareness' of being supported, which in turn positively affects their attitude towards the EU.

Then, we study the information channels underlying this effect. We are able to decompose the awareness variable with respect to the information source which made the respondent aware of being supported. This decomposition is available from a further question of the survey. Participants were asked how they became aware of being supported by regional policy, and five different sources were offered in the questionnaire (see Table 3 for descriptive statistics): (i) have read about it in press, (ii) have heard about it on television or radio, (iii) have seen information on signs, (iv) have personally received help, employment or advice, (v) know someone who received help, employment or advice. These different channels impacted very differently on public awareness: the strongest impact came from media, whereas very few citizens encountered regional policy by personally receiving transfers. The information signs also turn out to have a rather small effect on public awareness, despite their high visibility which is assumed by the European institutions.

Table 3: **Information sources**

	Press	TV or radio	Information signs	Recipient	Knows recipient
Share of responses	0.21	0.23	0.05	0.02	0.04

Total: 13,607 observations.

In column 2 of table 4, we replace the awareness dummy with its components (the dummies have the value of one in cases where the respondent became aware by means of the respective information source). These results show very different impacts on EU support depending on the sources of information. A highly significant positive impact can be detected for citizens who directly benefitted from transfers, and the quantitative impact is very strong: being a direct recipient of structural funds increases the probability of supporting the EU by 13.2%. A significant positive impact can besides only be measured for TV, but the marginal effect is much smaller in size (3.7%). Information by local press or through information signs, which are both very transparent indicators of a local

benefit, show a positive impact on EU support which, however, does not turn out to be significantly different from zero. Interestingly enough, the knowledge that other people received structural funds even has a negative impact on the respondents' support. One might speculate that in these cases the non-recipients evaluate regional transfers just like personal transfers from which they do not benefit, which inevitably leads to a negative cost-benefit analysis from their point of view.

Summing up, it can be concluded that the final link of our argumentation chain presented above can be confirmed, which implies that the awareness of being supported by EU regional policy positively impacts on the opinion towards the EU. However, just like the awareness itself, this effect is also highly heterogenous and crucially depends on the source of information which makes the citizen aware of being supported.

Table 4: **Regression results: support for EU membership – ordered probit (EB 43.1 only)**

	(1)		(2)		(3)	
Variable	**Coeff.**	**Marg. eff.**	**Coeff.**	**Marg. eff.**	**Coeff.**	**Marg. eff.**
Informed	0.101**	0.039	–	–	–	–
	(0.044)					
Informed: press	–	–	0.043	0.017	–	–
			(0.050)			
Informed: tv	–	–	0.097**	0.037	–	–
			(0.043)			
Informed: signs	–	–	0.098	0.038	–	–
			(0.073)			
Informed: ownexp	–	–	0.363***	0.131	–	–
			(0.135)			
Informed: othexp	–	–	-0.135*	-0.053	–	–
			(0.074)			
Regional Payments$_{rc,t}$	–	–	–	–	0.0036***	0.0014
-National Payments $_{c,t}$					(0.0012)	
National Payments$_{c,t}$	–	–	–	–	0.0025***	0.0010
					(0.0006)	
Male	0.110***	0.043	0.105***	0.041	0.114**	0.044
	(0.039)		(0.040)		(0.046)	
Age	-0.020*	-0.008	0.021*	0.008	0.020	0.008
	(0.011)		(0.011)		(0.015)	
Ideology	0.043**	0.017	0.043**	0.017	0.033	0.013
	(0.022)		(0.022)		(0.021)	
Ideology extreme	-0.038***	-0.015	-0.038***	-0.015	-0.039***	-0.015
	(0.011)		(0.011)		(0.013)	
Income	0.075***	0.029	0.073***	0.028	0.077***	0.030
	(0.015)		(0.014)		(0.015)	
Education: high	0.210***	0.080	0.208***	0.079	0.253***	0.097
	(0.079)		(0.077)		(0.061)	
Education: medium	0.081*	0.031	0.082*	0.031	0.074	0.027
	(0.045)		(0.044)		(0.045)	
Education: study	0.268***	0.100	0.267***	0.099	0.305***	0.115
	(0.084)		(0.082)		(0.084)	
Profession: farmer	-0.263**	-0.104	-0.262**	-0.104	-0.235	-0.093
	(0.123)		(0.125)		(0.145)	

	(1)		(2)		(3)	
Variable	**Coeff.**	**Marg. eff.**	**Coeff.**	**Marg. eff.**	**Coeff.**	**Marg. eff.**
Profession: manual	-0.135***	-0.053	-0.132***	-0.051	-0.171***	-0.067
	(0.037)		(0.037)		(0.048)	
Profession: professional	0.089	0.034	0.086	0.033	0.067	0.026
	(0.096)		(0.097)		(0.122)	
Profession: executive	0.111	0.042	0.102	0.039	0.138	0.053
	(0.152)		(0.154)		(0.167)	
Profession: unemployed	-0.073	-0.028	-0.074	-0.029	-0.087	-0.034
	(0.066)		(0.067)		(0.065)	
Profession: retired	-0.033	-0.013	-0.032	-0.012	-0.044	-0.017
	(0.038)		(0.037)		(0.052)	
Rural	0.060	0.023	0.059	0.023	0.072	0.028
	(0.040)		(0.040)		(0.045)	
Unemployment rate	-0.003	-0.001	-0.003	-0.001	-0.008	-0.003
	(0.005)		(0.005)		(0.005)	
Share agriculture	1.657***	0.640	1.662***	0.642	0.653	0.255
	(0.522)		(0.523)		(0.510)	
Share services	-0.965	-0.373	-0.949	-0.367	-0.474	-0.185
	(0.651)		(0.647)		(0.654)	
Density	0.039	0.015	0.042	0.016	0.064	0.025
	(0.039)		(0.038)		(0.042)	
Border	-0.076	-0.029	-0.075	-0.029	-0.024	-0.010
	(0.106)		(0.106)		(0.107)	
Centrality	0.110	0.042	0.108	0.042	0.108	0.042
	(0.074)		(0.074)		(0.084)	
Years of Membership	0.018***	0.007	0.019***	0.007	0.020***	0.008
	(0.003)		(0.003)		(0.003)	
N	9,810		9,831		6,553	
Prob > chi2	0.000		0.000		0.000	

Robust standard errors allowing for clustering at the regional level in parentheses: * Significant at the 10% level. ** Significant at the 5% level. *** Significant at the 1% level. Marginal effects are calculated for answer class 1 (membership in the EU is a good thing).

Finally, we study whether the positive effect of transfers on EU support is limited to those citizens who state that they are aware of ERDF. The relative small share of those who affirm this (less than one third) suggests that much of the effect might be transmitted indirectly. Possible indirect channels are social interactions with people who are aware of EU transfers (and, consequently, more EU-friendly), more positive media coverage of the EU in supported regions or a more EU-friendly sentiment of local politics.[19] In column 3 of table 4, the sample is limited to those respondents who negate the awareness of being supported. The results again indicate a positive impact of transfers on EU support, thus implying that transfers also might affect public support indirectly.

[19]Moreover, it cannot be excluded that some people who were actually aware of EU regional policy spending did not understand the rather technical survey question, which explicitly referred to the ERDF, correctly.

6 Conclusions

The European institutions have a high interest in increasing the public opinion towards European integration. As we have shown, the transfers targeted to the European regions in the framework of the structural policy indeed show a positive impact on the public support of the EU. The impact of these transfers over the period 1995-1999 turned out to be significant and sizeable. However, this positive effect on the public opinion was not restricted to benefited regions, since spill-over within the countries seem to be at work. The results indicate that citizens mainly take transfers to their own region into account, but to a smaller extent also transfers to other regions of their home country.

This paper also provides more general evidence concerning the relevance of vote purchasing approaches. As we presented above, it is important to disentangle two aspects when studying the impact of regional transfers on public opinion. First, citizens have to be aware of being supported, and second, this knowledge has to be reflected in higher support by the citizens, i.e., the benefactor has to get a reward for the transfers. In this regard, this paper is the first to present evidence for this complete transmission process. We found evidence that both steps tend to work as predicted. However, these processes are far from having homogenous effects across all citizens. First, the awareness of being a beneficiary of transfers is conditional on a number of further socio-economic characteristics. Primarily, education seems to play an important role, since higher educated people do not only show the higher unconditional awareness of being supported, but they also react stronger to regional transfers than lower educated people. Second, the awareness of being supported is generally reflected in higher public support of the EU, but this effect is also heterogenous. In particular, it is the channel of information which is important. As demonstrated, a positive awareness can even lead to a negative assessment of regional policy in cases where other people are direct recipients of funds.

This paper has demonstrated that some predictions which underlie the vote purchasing literature can be confirmed for EU regional policy. However, one should be reluctant to generalize the implications to all kinds of national transfer policies that are conducted by higher-tier governments of national federal systems. In particular, the observed effects require a high level of transfers and a high visibility to the citizens, two preconditions which are apparently met by EU regional policy, but not necessarily for short-term programs issued by the incumbents at the national level prior to elections. Even more so,

personal transfers turned out to have a much higher impact on the individual's opinion. Consequently, this should be the more relevant instrument concerning the purchasing of votes, which is also supported by the study of Manacorda et al. (2009) for electoral effects of personal transfer policies.

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7 Appendix

Table 5: Regional Policy: Payments per capita

Country	Mean	Std. Dev.	Min.	Max
France	21.25	14.60	5.44	126.93
Belgium	21.62	27.14	4.78	133.13
Netherlands	15.89	13.13	3.07	166.40
Germany	63.42	63.24	1.66	243.58
Italy	36.52	46.01	0.00	296.93
Luxembourg	14.66	6.06	9.42	24.08
Denmark	13.37	3.57	9.97	18.60
Ireland	244.65	18.76	214.20	289.29
United Kingdom	20.47	17.71	0.00	93.14
Greece	162.58	43.76	116.62	306.33
Spain	121.56	72.37	16.42	365.71
Portugal	207.07	33.76	152.94	283.62
Finland	33.07	17.45	12.30	68.02
Sweden	15.45	11.05	3.07	48.87
Austria	20.78	15.24	4.04	160.59

Table 6: Descriptive Statistics

Variable	**Description**	**Mean**	**Std. Dev.**	**Min**	**Max**	**Source**
Individual level data						
EU Support	Answer to the survey question: "Generally speaking, do you think that your country's membership of the European Union is a good thing, bad thing or neither good nor bad?"; good: 1, neither good or bad: 2, bad: 3	1.61	0.76	1	3	Mannheim Eurobarometer Trend File
Male	Dummy variable for male	0.51	0.50	0	1	ibid
Age	Age groups: 1 for age $<$ 25, 2 for $<$ 35, 3 for $<$ 45, 4 for $<$ 55, 5 for $<$ 65, 6 for $>=$ 65	3.61	1.70	1	6	ibid
Ideology	Ideological position stated by the survey respondent, ranging from 1 (left) to 10 (right)	5.23	2.02	1	10	ibid
Ideology extreme	Absolute difference of stated ideology from center	1.64	1.21	0.5	4.5	own calculations based on ibid
Income	Personal income based on income quartiles	2.40	1.10	1	4	own calculations based on ibid
Education: high	Dummy variable for respondents who stopped full-time education at the age of 20 or older	0.28	0.45	0	1	ibid
Education: medium	Dummy variable for respondents who stopped full-time education between the age of 16 and 19	0.37	0.48	0	1	ibid
Education: study	Dummy variable for respondents who are still studying	0.08	0.29	0	1	ibid
Profession: farmer	Dummy variable for farmers	0.02	0.13	0	1	ibid

Variable	Description	Mean	Std. Dev.	Min	Max	Source
Profession: manual	Dummy variable for manual workers	0.14	0.34	0	1	ibid
Profession: professional	Dummy variable for professionals	0.03	0.18	0	1	ibid
Profession: executive	Dummy variable for executive positions	0.02	0.12	0	1	ibid
Profession: unemployed	Dummy variable for unemployed people	0.06	0.24	0	1	ibid
Profession: retired	Dummy variable for retired people	0.21	0.41	0	1	ibid
Rural	Dummy variable for retired people	0.21	0.41	0	1	ibid
Rural	Dummy variable for rural communities	0.27	0.45	0	1	own calculations based on ibid
Regional level data						
Regional payments	Regional policy payments in Euros per capita	61.41	76.53	0	365.71	own calculations based on various issues of the Annual Report on the Structural Funds by the European Commission
Unemployment	Unemployment rate	8.91	5.98	2.29	39.1	European Regional Database, Cambridge Econometrics
Share agriculture	Share of agriculture in total employment	0.07	0.08	0.00	0.61	own calculations based on European Regional Database, Cambridge Econometrics
Share services	Share of services in total GVA	0.45	0.08	0.28	0.70	own calculations based on European Regional Database, Cambridge Econometrics
Density	Population in 1,000 per km^2	0.34	0.73	0.00	5.94	own calculations based on European Regional Database, Cambridge Econometrics
Border	Dummy for regions sharing a border with other member state	0.39	0.40	0	1	own calculations
Centrality	Index for the accessibility of regions, ranging from 1 (very peripheral) to 5 (very central)	2.98	0.87	1	5	ESPON (2005)
National level data						
Intra-EU Trade	Share of intra-Eu trade in GDP	0.21	0.11	0.09	0.51	own calculations
Years of Membership	Years of membership in the EU	20.62	14.97	0	41	own calculations

Figure 1: Map of eligible regions

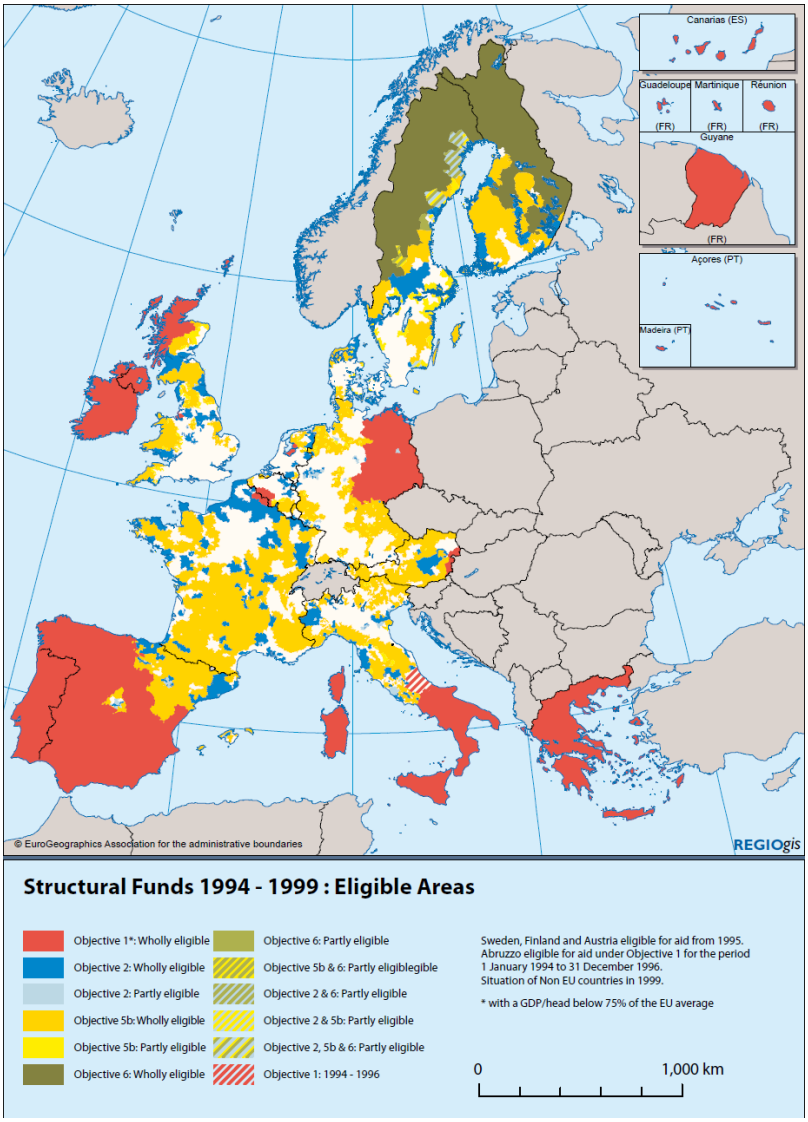


Figure 2: Development of EU support

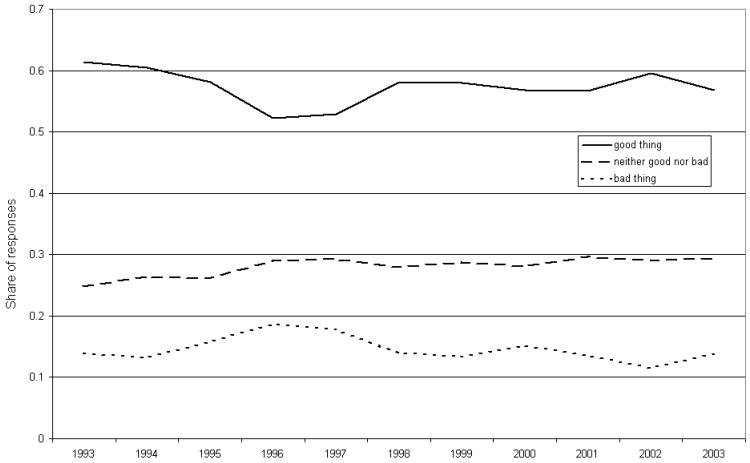
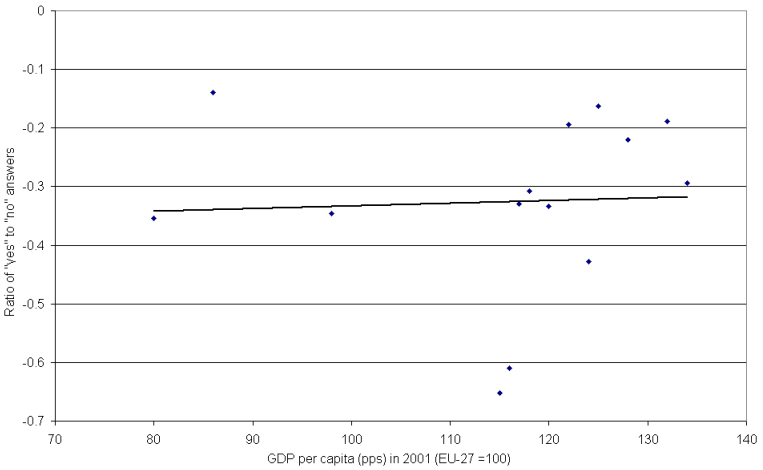


Figure 3: Correlation of national prosperity and expected benefits from trade liberalisation



The reported question is Q35 from Eurobarometer 55.1: "Do you think that your personal financial situation will benefit from this liberalisation?"

Figure 4: Correlation of country dummies and par capita transfers