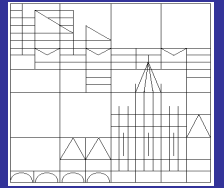




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*A Political Economy Explanation for In-kind Redistribution:
The Interplay of Corruption and Democracy*

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Working Paper Series
2012-25

<http://www.wiwi.uni-konstanz.de/forschung/>

A POLITICAL ECONOMY EXPLANATION FOR IN-KIND REDISTRIBUTION: THE INTERPLAY OF CORRUPTION AND DEMOCRACY

Zohal Hessami^{*}, Claudio Thum[‡], and Silke Uebelmesser[†]

Abstract

This paper identifies a novel political-economy explanation for the observed variation in the cash and in-kind (basic health care, public housing or food stamps) mixture of social transfers. We put forward the hypothesis that the share of in-kind transfers is positively correlated with corruption in democratic countries. The argument is derived in a theoretical model which assumes that it is easier for politicians to appropriate cash transfers than in-kind transfers. Voters in corrupt countries know that cash transfers invite corrupt behavior and therefore they elect parties that opt for in-kind redistributive measures. The empirical analysis for 34 OECD countries over the 1984 – 2007 period provides robust evidence in favor of this hypothesis. Moreover, the positive correlation between the in-kind share of social transfers and perceived corruption is stronger for the “most democratic” OECD countries and in countries with specific institutional characteristics such as free media that further enhance democratic accountability.

JEL Classification: D7; H42; H5

Keywords: In-kind social transfers; redistribution; corruption; democracy; social expenditures

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1. Introduction

Nowadays, governments in developed countries dispose of substantial fiscal resources to perform basic functions such as national defense, public order and safety, and the protection of property rights as well as additional functions that were added subsequently such as education and environmental protection. Moreover, about a third of the public budget in OECD countries is spent on social expenditures. At closer inspection, two interesting observations can be made: First, there is variation in the importance of social transfers across countries, which the literature mainly attributes to partisan biases, cultural differences, the vulnerability to international macroeconomic shocks, and the general prosperity of a country (Congleton and Bose, 2010; Hicks and Swank, 1992; Rodrik, 1998).¹ A second and more puzzling observation is the cross-country heterogeneity in the choice of redistributive measures. In some countries social transfers are mostly allocated to recipients *in cash*; in other countries *in-kind* transfers are the prevalent instrument.² A government's choice of redistributive measures is of interest as for instance it may influence the extent to which redistribution from rich to poor is successful.³

While the theoretical public finance literature on the public provision of private goods (i.e. in-kind redistribution) is quite extensive and especially emphasizes arguments related to self-targeting and paternalism considerations (see Balestrino, 2000; Besley and Coate 1991; Blackorby and Donaldson, 1988; Blomquist and Christiansen, 1995; Munro, 1992; Thum, 2000; Thum and Thum, 2001), political-economy explanations for the cross-country heterogeneity in the composition of social transfers are quite scarce.⁴

As a first notable contribution, Bergstrom and Blomquist (1996) argue that selfish taxpayers without children favor public provision of daycare so that mothers can join the labor force and thereby contribute to an increase in tax revenues. Lundholm and Ohlsson (1998) extend this argument by taking into account the wages of those women who benefit directly from daycare facilities and by showing that the Pareto-optimal amount of publicly provided daycare lies between the optimal levels of parents and non-parents. Both papers, however, do not analyze the composition of transfer instruments, i.e. the relative importance of monetary and in-kind transfers, but only provide a general rationale for the public provision of private goods in one specific context, i.e. daycare.

A third study by Barse et al. (2000) is more directly related to our investigation and explains the empirical observation that poor countries make more use of in-kind redistribution than rich countries. The authors derive that high-income earners in poor countries would opt out of the publicly provided goods

¹ Usually, Anglo-Saxon countries and Scandinavian countries are to be found at the lower and upper end of this distribution, respectively.

² Note that in the public finance literature “in-kind provision of social transfers”, “public provision of private goods” and “indirect redistribution” are synonymous terms.

³ As an example, see Ter Rele (2007) for an estimate of the redistributive effects of cash and non-cash transfers in the Netherlands.

⁴ Currie and Gahvari (2008) underline the importance of political economy explanations for in-kind redistribution by stating that “Political economy considerations must also be part of the story” (p. 334).

(e.g. education) given the low quality of provision. This renders these programs more redistributive and induces the (poor) median voter to allocate more resources to in-kind redistribution.⁵

Our objective is to extend the theoretical literature that explains the existence of international differences in the in-kind provision of social transfers by emphasizing the fact that countries differ *both* in the extent of corruption and voters' ability to hold politicians accountable for their actions. In our model, politicians make use of redistributive measures to the poor to please the (economically deprived) majority of voters. Politicians have two instruments of redistribution at their disposal: monetary transfers and in-kind transfers. This choice is partly influenced by the fact that corrupt politicians seek to appropriate (part of) the public transfers.⁶

Monetary transfers have the advantage of leaving consumption choices undistorted unlike in-kind transfers which can neither be resold nor be topped up.⁷ On the other hand, in contrast to monetary transfers in-kind redistribution allows for better monitoring by the general public, which reduces the opportunities for the appropriation of public resources by politicians.^{8,9}

In summary, we argue that there is a political-economy argument for in-kind redistribution given that the consumption of in-kind transfers can be more easily monitored by citizens than monetary transfers. This mechanism, however, only applies to countries in which voters have the power to elect candidates that implement in-kind redistributive measures. In countries, where voters have little influence on political decisions, we expect to see a higher cash share of social transfers regardless of the level of corruption.

The empirical literature on the influence of corruption on the composition of public spending is generally scarce, while the effect of corruption (as well as the extent of democracy) on the cash and in-kind share of social transfers has not been investigated at all to date.¹⁰ Currie and Gahvari (2008) in particular point to “the limited empirical evidence that can be brought on” theoretical explanations for in-

⁵ Other studies with a political-economy focus are, e.g. Fernandez and Rogerson (1995), Epple and Romano (1996a,b), Gouveia (1997), and De Donder and Hindriks (1998). They study the political struggle between different income groups and the (non-)existence of voting equilibria whereas our explanation focuses on the quality of political institutions, in particular democracy and corruption.

⁶ This behavior is a form of corruption in the sense that it is an act “in which the power of public office is used for personal gains in a manner that contravenes the rules of the game” (Jain, 2001, p. 73).

⁷ These are the standard assumptions in the literature of the public provision of private goods which allow us to use the self-selection property of in-kind transfers and which prevent the publicly provided goods from being equivalent to monetary transfers.

⁸ An example is (basic) health care. In many countries, health care is at least in parts publicly provided, i.e. tax-financed and means-tested. It can be neither topped up very easily nor resold if it is defined such that it only allows access to selected health-care providers (doctors and hospitals) offering basic health care.

⁹ A case in point are the 2 million € paid every month as pensions to already deceased individuals in Greece (Reuters, 2011). One can argue that had old-age transfers been provided in-kind, e.g. in the form of accommodation in a nursing home, this fraud would not have happened.

¹⁰ Moreover, the theoretical foundation for the existing empirical analyses is of a different nature. It is based on the idea that corruption in public procurement is less observable and more lucrative with regard to certain kinds of expenditures such as defense expenditures (Gupta et al., 2001; Mauro, 1998). Based on similar arguments illustrated with a two-stage rent-seeking model, Hessami (2011) provides evidence for OECD countries that public expenditures on waste (water) management and medical equipment for public hospitals are also prone to corruption.

kind redistribution and state that “the empirical work seems to largely accept the paternalism theory and move on to other questions” (p. 334). Therefore, in a second step we conduct an empirical analysis in order to test the implications of our theory.

This paper analyzes the interplay of corruption and democracy as determinants of the composition of redistributive transfers in the presence of informational asymmetries with respect to politicians’ integrity. Our theoretical model illustrates that in a setting where voters have sufficient political power it is optimal to use mixed transfers consisting of monetary and in-kind transfers if corruption exceeds a certain level. This is the case even though the public provision of goods may distort the consumption of the recipients. Politicians then use in-kind transfers as a commitment device or as a signal of non-corrupt behavior. These considerations are confirmed in the regression analysis for 34 OECD countries over the time period from 1984 to 2007. We find that in democratic OECD countries voters have the political power to make sure that the cash share of social transfers¹¹ is lower when there are high levels of corruption. This is especially true for the most democratic countries in our sample. Moreover, particular political institutions within democratic countries amplify this effect.

The remainder of this paper is organized as follows. Section 2 analyzes theoretically why a government may choose to provide social transfers in-kind rather than in cash and compares the result with mixed transfers. Section 3 constitutes the empirical part of this paper and includes a description of the data and of the empirical strategy as well as an extensive regression analysis. Finally, Section 4 concludes the analysis.

2. Theoretical model

To analyze the role of in-kind transfers in democracies, we introduce a simple model. There are two types of individuals who differ with respect to their exogenously given income: N_L low-income, poor individuals (L) with income $\underline{Y} > 0$ and $N_H = 1$ high-income, rich individuals (H) with income \bar{Y} , where it holds that $\bar{Y} > \underline{Y}$ and $N_L > N_H$.¹² We assume that the individual income can be observed by those public officials that are in charge of allocating the public resources earmarked for redistribution.

For simplicity, we further assume that the individuals’ preferences can be represented by the Cobb-Douglas utility function

$$U_k = z_k^\alpha \cdot x_k^{1-\alpha}, \quad k = L, H, \quad (1)$$

¹¹ Our data on social transfers encompasses benefits for old age, survivors, incapacity, health, family, and housing.

¹² The assumption that the poor individuals are the majority is in line with the conventional wisdom of a left-skewed income distribution function which implies that the median income is below the mean income.

where z_k and x_k are the quantities of two (normal) private goods and α is the preference parameter. All prices are normalized to unity.

Redistribution from rich to poor can be seen as a two-stage process. In the first constitutional stage, the redistributive volume is determined by the choice of a lump-sum tax T levied on the rich. For the analysis that follows, the redistributive volume is considered to be given. In the second stage, the tax revenues from the rich are distributed to the poor or (partially) appropriated by the politician.

2.1 Normative analysis

As a benchmark for the positive analysis in section 2.2, we analyze which redistributive measure would maximize the utility of the poor for a given tax rate collected from the rich. Transfers per capita are given by the total amount of transfers T divided by the number of poor individuals N_L . In the following, the extent of redistribution is measured by the fraction t , which is defined as the transfer per poor citizen divided by the low income

$$t = \frac{T / N_L}{\underline{Y}}. \quad (2)$$

The fraction t shows the relative income increase of the low-income individual by the redistributive policy. With these monetary transfers each poor individual maximizes the utility

$$\max_{z_L, x_L} U_L(z_L, x_L) \text{ s.t. } (1+t) \cdot \underline{Y} = z_L + x_L \quad (3)$$

which results in the indirect utility

$$V_L^*(\underline{Y} + t\underline{Y}) = A(1+t)\underline{Y} \quad (4)$$

where

$$A \equiv \alpha^\alpha (1-\alpha)^{1-\alpha}. \quad (5)$$

This is the first best solution given the transfer t , i.e. the highest utility level of the poor citizens that can be achieved for given parameter values.

2.2 Positive analysis

We now consider electoral competition with two politicians to determine how the tax revenues from the rich are distributed to the poor.¹³ In the run-up to the election, each politician proposes a transfer instrument $q = M, IM, I$ from the three possible instruments monetary transfers (M), mixed transfers (IM) and in-kind transfers (I), in order to maximize the rents from holding office. The degree of democracy and thus the degree of being held accountable by the voters determines the extent to which the politician has to trade-off his utility against the (poor) voters' utility. Then, the election takes place and the politician who gets elected implements the proposed transfer policy.

To see which policy the politicians propose, we have to characterize the different transfer instruments.

2.2.1 Instruments

Monetary transfers

Without corruption, the total amount of tax revenues benefits the poor. It is, however, likely that tax revenues are diverted to other purposes in the presence of corruption. Corrupt politicians might use part of the tax revenues for their own consumption or to benefit other groups. This redirection of monetary transfers can hardly be observed if the population cannot monitor who receives transfers.

To capture this aspect of corruption, we assume that π is an indicator for the level of corruption in this country. This parameter also measures how corrupt the incumbent is, i.e. which share of the tax revenues he will appropriate. The transfer level therefore decreases to

$$T^M = (1 - \pi)T. \quad (6)$$

where the superscript M denotes monetary transfers. Corruption reduces transfers leading to the maximized utility

$$V_L^M (\underline{Y} + (1 - \pi)t\underline{Y}) = A(1 + (1 - \pi)t) \underline{Y}. \quad (7)$$

We can state

Proposition 1: *In the presence of corruption, $\pi > 0$ monetary transfers result in lower utility of the poor than in the first-best scenario.*

Proof: *This follows from comparing (4) and (7).*

¹³ It is also possible to consider instead an incumbent who wants to be reelected. If this politician only looks at the next period (myopic view) when choosing the optimal transfer instrument, the analysis is unchanged.

In-kind transfers

The government can also redistribute income via in-kind transfers. This precludes in our model the possibility that public resources earmarked for redistribution are appropriated.¹⁴ In that case, the government provides the good z with a fixed quantity \bar{z} free of charge to the poor.¹⁵ Each citizen can observe the quantity and quality of this good as well as the group of recipients. A disadvantage of this mechanism results, however, from the distortion of the consumption decision of the recipients.

The politician's optimization problem is given by

$$\max_{\bar{z}} U_L(\bar{z}, \underline{Y}) \text{ s.t. } \bar{z} = t \underline{Y} \quad (8)$$

and for the utility of the low-income group we get

$$V_L^I(t \underline{Y}, \underline{Y}) = t^\alpha \underline{Y} \quad (9)$$

where the superscript I denotes the in-kind transfer via the public provision of the private good z .

Mixed transfers

Finally, we consider the option of mixing monetary and in-kind transfers. This allows both lowering the consumption distortion and reducing corruption. The optimal mixture is derived by maximizing the utility of the low-income group subject to the budget constraint with respect to the fraction of transfers γ that is used for in-kind transfers

$$\max_{\gamma} U_L(\gamma \bar{z}, \underline{Y} + (1-\gamma)(1-\pi)t \underline{Y}) \text{ s.t. } \gamma \bar{z} + (1-\gamma)t \underline{Y} = t \underline{Y}. \quad (10)$$

The maximized utility is given by $V_L^{IM}(\gamma^* \bar{z}, \underline{Y} + (1-\gamma^*)(1-\pi)t \underline{Y})$ where IM indicates the mixed regime and γ^* denotes the optimal fraction

¹⁴ More specifically, it is relatively easier to appropriate part of the redistributive volume with monetary transfers than with in-kind transfers given the relatively easier monitoring possibilities of the latter. In the model, we capture these differences by assuming that only monetary transfers can be (partly) appropriated, while in-kind transfers are immune to this. Of course, this is an exaggeration, which we make in order to simplify the notation and to avoid the introduction of an additional parameter into our model.

¹⁵ We abstain here from modeling the individual choice of this good and also do not include any self-selection mechanism as this is not the focus in this paper. See on this the literature mentioned in the Introduction.

$$\gamma^* \in \min \left\{ \frac{\alpha[(1-\pi)t+1]}{(1-\pi)t}, 1 \right\} \quad (11)$$

where for $\alpha > 0$, it follows that $\gamma^* \in (0, 1]$

The mixed transfer system is at least as good as in-kind transfers. Pure in-kind transfers can be obtained by setting γ equal to 1. The reverse, however, is not true. Lowering γ to 0 does not mean that the mixed system converges to pure monetary transfers. The reason lies in the nature of the good z that cannot be topped up (as is the case with an apartment of 1 m²). The lower the publicly provided quantity, the stronger is the restriction on the consumption of the transfer recipients.

2.2.2 Comparison

Comparison of monetary and in-kind transfers

Both monetary transfers (policy M) and in-kind transfers (policy I) have their costs. Corrupt politicians can spend monetary transfers on other purposes than redistribution, which decreases the transfer level. In-kind transfers distort the consumption bundle of the transfer recipients. By comparing the utility of the poor individuals for the two policy options, the optimal transfer type can be derived

$$V_L^M(\underline{Y} + (1-\pi)t\underline{Y}) \begin{cases} > \\ = \\ < \end{cases} V_L^I(t\underline{Y}, \underline{Y}) \Leftrightarrow \pi \begin{cases} < \\ = \\ > \end{cases} 1 - \frac{t^\alpha - A}{At} . \quad (12)$$

The optimal policy depends on the proportion of corrupt politicians π , the transfer level t , and the preference parameter α .

In order to interpret the desirability of in-kind transfers we start with the extreme case where there is no corruption (i.e. $\pi = 0$).

Proposition 2: *If there is no corruption (i.e. $\pi = 0$), (i) the first-best can be reached with monetary transfers for all levels of redistribution t (i.e. $V_L^M = V_L^*$ for any t), (ii) while there is at most one transfer level t' within the relevant range where in-kind transfers yield the first-best (i.e. $V_L^I(t') = V_L^*(t')$).*

Proof: *See the Appendix.*

Let us now turn to the case with corruption (i.e. $\pi > 0$). We conduct the following thought experiment. As we know from above, with no corruption (i.e. $\pi = 0$), in-kind transfers distort the consumption decision of the poor for $t \neq t'$. Monetary transfers are thus superior to public provision in the

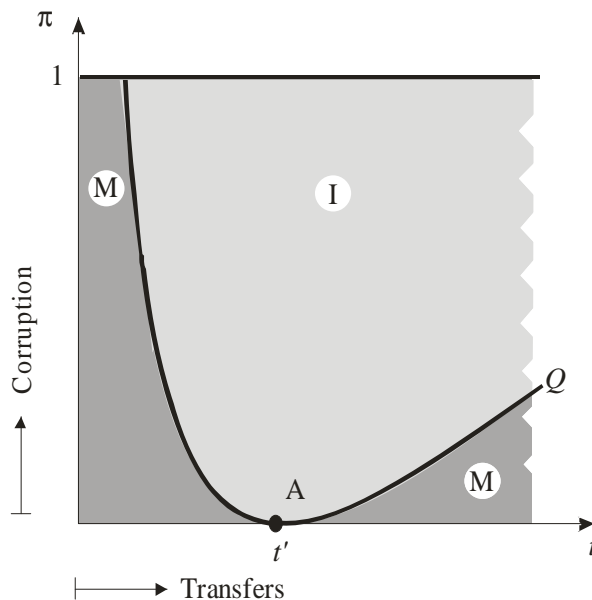
absence of corruption. A positive level of corruption ($\pi > 0$), however, reduces the expected monetary transfers. If corruption becomes sufficiently large, monetary transfers must be equivalent to in-kind transfers.

This is illustrated in Figure 1. All combinations of t and π where both policies are equivalent are represented by threshold Q

$$Q \equiv V_L^M(\underline{Y} + (1 - \pi)t\underline{Y}) - V_L^I(t\underline{Y}, \underline{Y}) = 0. \quad (13)$$

With transfer levels that deviate more strongly from a poor individual's optimum t' , the attractiveness of in-kind provision decreases given that the consumption distortion becomes larger. This distortion has to be weighed against the risk of appropriation of cash transfers by a corrupt politician. Therefore, monetary transfers only lead to a higher utility level of the poor when the level of corruption is low. It should also be noted that for very low transfer levels, monetary transfers are always preferred regardless of the extent of corruption. This can be explained with the assumption that the publicly provided private good cannot be resold or topped up. It is preferable for the poor to receive 10 euros (which they can use as a subsidy for a suitable accommodation) rather than to be provided with an apartment of 1 m².

Figure 1. Optimal transfer choice as a function of the transfer level and corruption



For all combinations (t, π) above this threshold Q , i.e. for high levels of corruption c.p., in-kind transfers are optimal, since the distortion of consumption is less important than the loss due to corruption with monetary transfers. The opposite is true below the threshold. We can state

Proposition 3: *With sufficiently high corruption, in-kind transfers are superior to monetary transfers.*

Proof: From (12), it follows that $V_L^I > V_L^M \Leftrightarrow \pi > 1 - \frac{t^\alpha - A}{At}$.

Point A with $\pi = 0$ represents the solution where both policies yield the first best. At this point, the slope of the threshold Q is equal to 0.¹⁶ For higher (lower) transfers, the slope of the threshold line is positive (negative), i.e.

$$\left. \frac{d\pi}{dt} \right|_{Q=0} \begin{cases} > \\ = \\ < \end{cases} 0 \Leftrightarrow t \begin{cases} > \\ = \\ < \end{cases} t' = \frac{\alpha}{1-\alpha}. \quad (14)$$

Comparison of mixed transfers with monetary and in-kind transfers

As we know from above, with pure in-kind transfers the poor individual consumes her optimal consumption bundle at the transfer level t' . For transfers below t' , the publicly provided quantity is lower than the first best consumption quantity. Mixed transfers would mean that this quantity is further decreased. This cannot be superior to pure public provision.

For transfers above t' , the mixed transfer system can improve the pure policies. In the following, we will focus on $t > t'$ and distinguish between two cases: First, as we know from Figure 1, below the threshold Q , pure monetary transfers are superior to pure in-kind transfers. The mixing of transfers allows the public provision of the quantity that the individual would have demanded with pure monetary transfers without causing corruption and thus allows for higher effective transfers. Second, above the threshold Q , pure in-kind transfers are superior to pure monetary transfers. Since the publicly provided quantity is higher than the first-best consumption quantity, however, introducing monetary transfers increases the utility even though monetary transfers are reduced by corruption.

These results are illustrated in Figure 2. Compared to Figure 1, threshold K is added which indicates the combination of the transfer level t and the level of corruption π where policy I and the mixed policy IM (for $\gamma = \gamma^*$) are equivalent

$$K \equiv V_L^{IM} \left(\gamma^* \bar{z}, \underline{Y} + (1 - \gamma^*) (1 - \pi) t \underline{Y} \right) - V_L^I (t \underline{Y}, \underline{Y}) = 0. \quad (15)$$

This holds for

$$\pi = 1 - \frac{\alpha}{1-\alpha} \frac{1}{t}. \quad (16)$$

¹⁶ For the derivation of the slope, see the Appendix.

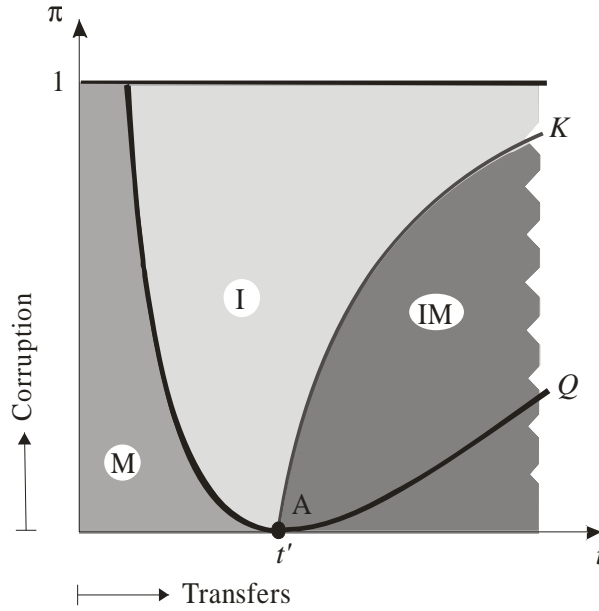
We can therefore state

Proposition 4: (i) For low transfer levels ($t < t'$), either pure monetary transfers or pure in-kind transfers are optimal depending on the level of corruption. (ii) For high transfer levels ($t > t'$), mixing of transfers is an optimal policy if corruption is low, i.e. $\pi \in \left[0, 1 - \frac{\alpha}{1 - \alpha t}\right]$, while for high levels of corruption pure in-kind transfers are superior.

Proof: (i) See the arguments as provided in the text. (ii) From (15) and (16) it follows that

$$V_L^{\text{IM}}\left(\gamma^* \bar{z}, \underline{Y} + (1 - \gamma^*)(1 - \pi)t\underline{Y}\right) \begin{cases} > \\ < \end{cases} V_L^{\text{I}}(t\underline{Y}, \underline{Y}) \Leftrightarrow \pi \begin{cases} < \\ > \end{cases} 1 - \frac{\alpha}{1 - \alpha t}.$$

Figure 2. Optimal transfer choice as a function of the transfer level and corruption with mixed-transfers



At point A, the optimal fraction of transfers γ^* is equal to 1, i.e. all transfers are used for in-kind transfers. With an increase in transfers to $t > t'$, the optimal policy is the mixing of transfers (i.e. $\gamma^* < 1$) for lower levels of corruption, while mixing becomes less favorable for higher levels of corruption. The slope of the threshold line K is positive¹⁷

$$\left. \frac{d\pi}{dt} \right|_{K=0} > 0. \quad (17)$$

The intuition for the emergence of region IM in Figure 2 can be described as follows. With transfer levels above t' the flexibility of the mixed transfer system makes it possible to provide the transfer

¹⁷ This is derived in the Appendix.

recipient with the optimal amount of the private good, while also transferring a certain cash sum to the recipient, which he can use in other ways. A pure in-kind provision would in this case have the disadvantage that the recipient would not value the higher level of the good that is provided as much as he would value an additional cash transfer.

In a democracy, voters should vote for politicians who propose a program which allows for sufficiently good monitoring given the level of corruption and the transfer level. Politicians have to take this into account, when choosing the transfer instrument.

2.2.3 Politicians' choice of redistributive instruments

The politician's objective function can be written as

$$W^q = (1 - D)U_{Pol}^q + D U_L^q. \quad (18)$$

where $D \in [0,1]$ denotes the degree of democracy,¹⁸ and U_L^q and U_{Pol}^q the utility of the (poor) majority and the politician's own utility, respectively, both as a function of the chosen transfer instrument q . Holding office opens up the possibility of appropriating rents. For small D , the politician's interest determines the choice of the transfer instrument, while for large D , the voters' interest matters.

As to U_{Pol}^q , it is straightforward to order the transfer instruments with respect to the utility they generate for the politician: $M \succ IM \succ I$. Monetary transfers allow appropriation of $\pi t \underline{Y}$, mixed transfers of $\pi(1 - \gamma^*)t \underline{Y}$ with $\gamma^* \in (0,1]$ as determined in (11), while it is not possible for the politician to divert resources with in-kind transfers. It follows that in the extreme case with a completely undemocratic political regime ($D = 0$), politicians will choose monetary transfers as redistributive measure.

As to U_L^q , the analysis above has shown which transfer policy is optimal from the low-income voters' perspective as a function of the redistributive volume and the level of corruption (see Figure 2). Voters elect the politician whose policy generates the highest utility for them. To say it differently, if the low-income voters' utility U_L^q is higher (lower) with the policy proposed by politician i than with the one proposed by politician j , politician i will be elected with probability $p_i = 1$ ($p_i = 0$). If both politicians propose the same policy, their election probability is equal to 0.5.

¹⁸ Note that what we call democracy could also be understood as the efficiency of monitoring procedures, i.e. as the probability of being detected when cheating.

As long as $D > 0$, the proposed policies will converge in equilibrium, towards the one preferred by the poor median voter, i.e. $q_i = q_j = q_L^*$. Choosing q_L^* maximizes the politicians' probability of winning the election, which is a necessary condition for appropriating part of the transfer volume.¹⁹

Summarizing, a lower (higher) degree of democracy can be expected to make monetary transfers more (less) likely for any level of corruption $\pi \in (0,1]$. To test these hypotheses, we now turn to the empirical analysis.

3. Empirical analysis

3.1 Data description

The political economy argument for in-kind transfers put forward in this paper is that voters can monitor politicians via these transfers. A necessary condition is that voters are equipped with political power. Only if there is a sufficiently high degree of democracy, voters can choose between politicians and prevent the reelection of politicians who deviate from their election pledges. Hence, corruption and expenditures for cash transfers should be negatively correlated for democratic countries.²⁰ In the following, we focus on OECD countries in order to test this hypothesis. This choice is motivated by data availability as to the composition of social expenditures.

The OECD SOCX Database provides disaggregated data for social expenditures across seven domains: old age (on average accounting for 32.91% of social expenditures), health (28.78%), incapacity (11.66%), family (9.05%), unemployment (5.57%), survivors (5.25%), and housing (2.06%).²¹ As to the importance of in-kind relative to cash transfers, there is quite some variation across categories. The in-kind share of health and housing expenditures, e.g., is always 100%,²² while it is always 0% for unemployment-related social transfers in all periods and countries in our sample. As to old-age benefits, 7% of expenditures are on average provided in-kind across all periods and countries (examples include expenditures for residential care and home-help services for the elderly) while the in-kind share of survivor benefits capturing, e.g., financial support for funeral expenses amounts to 5%. The importance of

¹⁹ If the optimal policy q_L^* is redistribution via in-kind transfers, politicians cannot appropriate anything which makes them indifferent between being elected and not being elected. The underlying assumption then is that in this case they nevertheless choose the policy which maximizes their election probability.

²⁰ As already stated, the impact of corruption on the structure of public expenditures is analyzed in Gupta et al. (2001), Mauro (1997, 1998) and Hessami (2011).

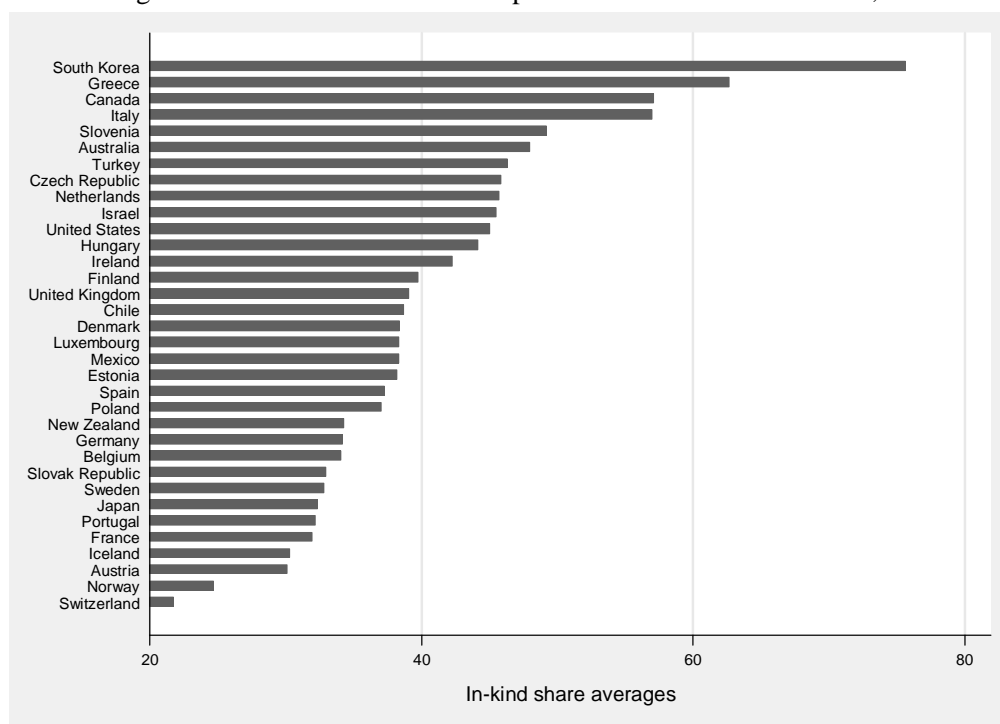
²¹ There is also data available for two additional domains: active labor market programs and other social policy areas. While the former is excluded from our analysis since only totals are available and no subdivision into cash and in-kind transfers, the latter is not considered as it only represents a negligible share of total social transfers. These two categories add up to 4.72% of total social expenditures. For a detailed description of the SOCX Database, see OECD (2011).

²² In the case of health benefits, it should be noted that cash benefits related to sickness are captured in the incapacity-related category.

in-kind benefits is slightly larger for incapacity-related expenditures with a share of 12% (e.g. residential care, home-help services and rehabilitation) and even more so for family benefits with a share of 32% (e.g. day-care and home-help services).

In addition to the variation of the in-kind share across categories, there is also variation across countries and over time. Figure 3 illustrates averages for the in-kind share of social expenditures for each of the 34 countries in our sample. South Korea is the country with the highest in-kind share, whereas Switzerland has the lowest values. Figure 6 in the appendix in addition illustrates the over-time variation of this variable for each country. During our period of observation, the in-kind share increases by about 20 percentage points in Luxembourg, Mexico, Sweden, Switzerland and the US, while South Korea witnessed a decrease of comparable magnitude between 1987 and 2007.²³ Overall, regarding the in-kind share of social expenditures, it should be noted that the variation of the dependent variable in our estimations is quite high.

Figure 3. Averages of in-kind shares of social expenditures: 34 OECD countries, 1984-2007



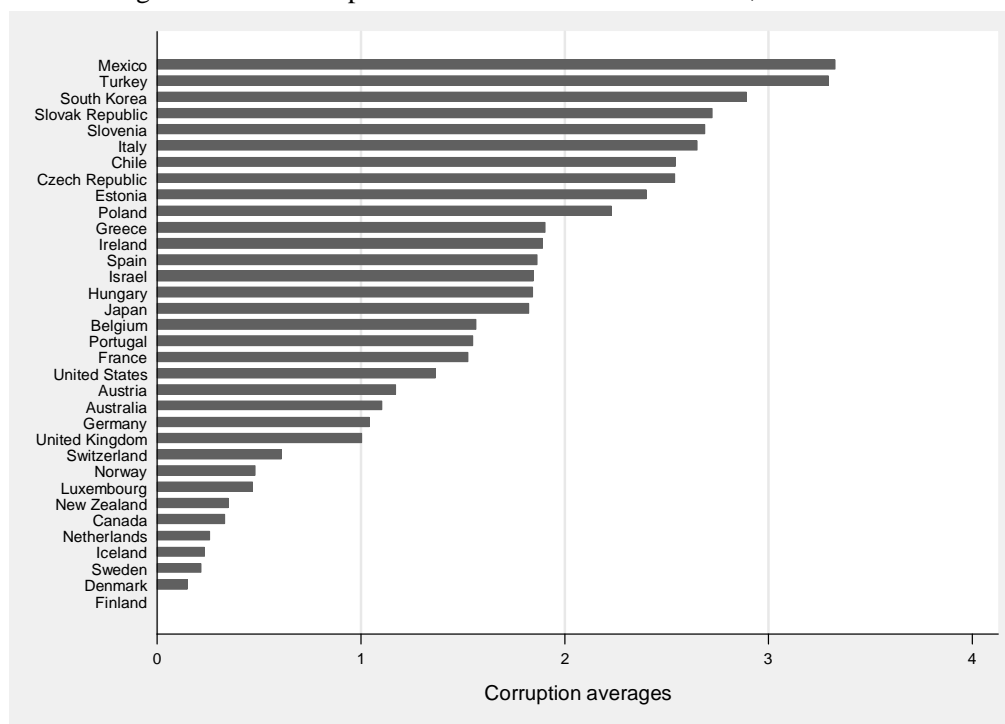
Source: OECD SOCX Database

The main explanatory variable in our regressions is the corruption index from the International Country Risk Guide (ICRG). We prefer this measure over the also widely used indices from Transparency

²³ The sharp increase in the mid-1990s by about 20 percentage points in Switzerland can be attributed to the introduction of compulsory health insurance in 1994 (WHO, 2000). Therefore, as of 1995, the share of in-kind social expenditures is driven up substantially due to the fact that health expenditures are entirely provided in-kind.

International and the World Bank since the ICRG index reaches back to the 1980s, while the latter only start in the mid-1990s. Figure 4 illustrates the variation in corruption perceptions across the 34 OECD countries with averages over the time period from 1984 to 2007. At the bottom of this distribution we find especially Nordic countries with values close to 0, while at the top there are Mexico and Turkey with values above 3 on a scale that reaches up to 6 worldwide. Most importantly, this bar chart underlines that focusing on OECD countries in an empirical study on the subject of corruption is appropriate given the large enough variation in corruption across countries.

Figure 4. Averages of ICRG corruption measure: 34 OECD countries, 1984-2007

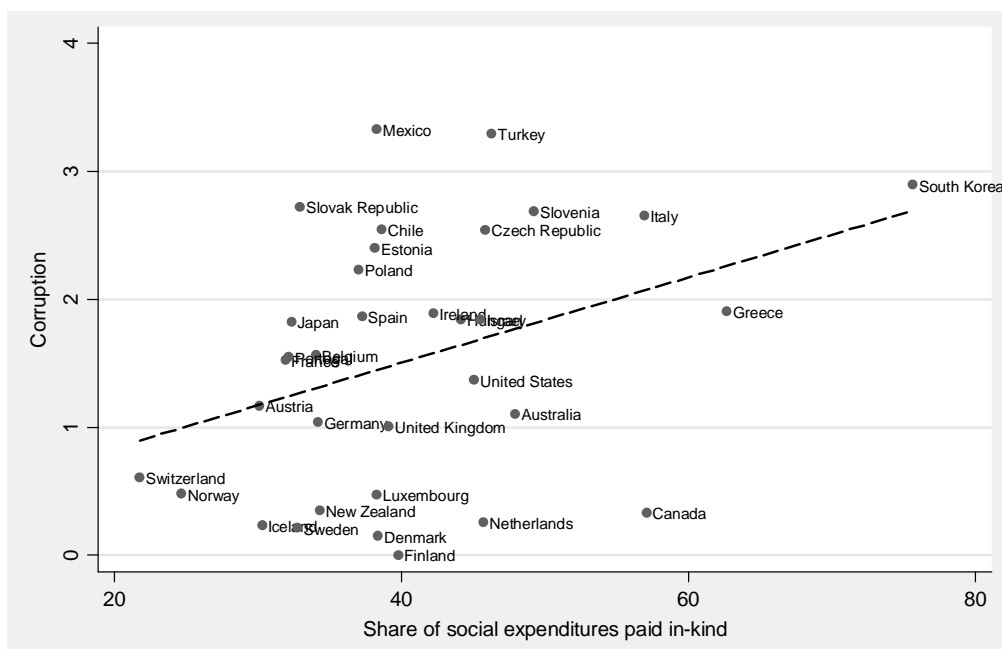


Source: ICRG Database

In order to get a first impression regarding the relationship between the in-kind share of social expenditures and the level of corruption, Figure 5 displays averages over the 1984-2007 period for these two variables. Each point in the scatter plot represents one of the 34 OECD countries. Overall, Figure 5 suggests a positive relationship between the two variables as suggested by our theoretical considerations in the previous chapters. However, it should not be overlooked that the omission of some countries such as South Korea and Greece in Figure 5 may rather point towards a negative relationship. Therefore, it will be important to conduct estimations with subgroups of countries in order to test the robustness of the regression results.

In the regression analysis, we will use three democracy indices in order to determine what role the extent of democracy plays for the relationship between corruption and the cash share of social transfers. One measure is the democratic accountability index taken from the International Country Risk Guide (cf. Figure 4). It is scaled from 0 to 6 and represents a multi-dimensional index that captures how responsive a government is to its people. The other two indices are provided by Freedom House: the political rights index and the civil liberties index which are used as indicators for the power of voters.²⁴ We have rescaled them so that 7 represents the most free and 1 the least free category, respectively.

Figure 5. Correlation between average corruption and mean share of social expenditures paid in-kind to recipients: 34 OECD countries, 1984-2007



Sources: OECD SOCX Database, ICRG Database

The empirical literature on the determinants of the in-kind share of social expenditures is very scarce or even non-existent. Therefore, control variables for the regressions have to be chosen carefully. First, we have decided to include a measure of the total redistributive volume, which follows also from the theoretical discussion in the previous section. In particular, we use the social expenditure-to-GDP ratio

²⁴ Freedom House is an independent organization that collects data on various dimensions of freedom and compliance with human rights in countries all over the world.

taken from the OECD SOCX Database.²⁵ Second, our estimations include the inflation rate on the right-hand side of the regression equation given that in high-inflation countries governments may be more inclined to pay transfers in-kind since otherwise either recipients will receive substantially fewer real transfers over time or the amount to be paid has to be constantly renegotiated and adjusted. Third, we include a measure for the ideology of the chief executive's party taken from the Database of Political Institutions (DPI). It classifies governments as either right-wing (1), centrist (2) or left-wing (3). Our hypothesis is that left-wing parties are more interested in protecting the poor from being stigmatized. Therefore, when left-wing parties are in power a lower in-kind share and hence a higher cash share of social expenditures should be observed.²⁶ Fourth, we control for the population shares of people older than 65 and younger than 15 given that these are factors that influence the relative importance of social expenditures on old age and family benefits, which may in turn differ in the extent to which they are allocated in-kind. Fifth, following Barse et al. (2000) we include the log of real GDP per capita in order to capture how wealthy a country is. Based on their theoretical model, we would expect richer countries to have a lower in-kind share of social transfers.

Finally, a last step in the empirical analysis will be to give additional attention to the exact nature of democracies across the OECD. A number of recent contributions in the political economy literature point out that differences in the design of electoral systems give rise to differential political and economic outcomes and imply a substantial amount of variation in the degree to which citizens can control and hold their political representatives accountable. Therefore, we will use data on the following set of variables: the extent of press freedom, the World Bank's voice and accountability index, a dummy for independent judiciaries, closed lists, and a presidential system dummy as well as a measure for the extent of party polarization. A more detailed description of these variables and their sources is available in Appendix B.

3.2 Empirical strategy

Our regressions are based on the following empirical model:

$$\text{In-kind share of social transfers}_{it} = \alpha_i + \beta \text{Corruption}_{it} + \gamma \mathbf{X}_{it} + \mu_t + \varepsilon_{it} \quad (19)$$

where α_i and μ_t are the country and time fixed effects and ε_{it} is the random variable with the standard assumptions. In our case the cross-sectional dimension is $i = 1, 2, 3, \dots, 34$, whereas the time dimension is $t = 1, 2, \dots, 5$. Even though our data covers 24 years we have decided to use five-year averages. This has

²⁵ We also experimented with a squared social expenditure to GDP ratio in order to capture the non-linear relationships implied by figures 1 and 2. However, they always were insignificant and therefore they will not be discussed in the regression analysis section.

²⁶ For existing evidence on the effects of government ideology and inflation on the choice of redistributive measures see Hessami and Uebelmesser (2013).

the advantage that measurement errors are to some degree eliminated. Vector \mathbf{X}_{it} contains the control variables that have been described in section 3.1.

3.3 Results

The first set of estimations includes eight models which differ with regard to the control variables (Table 1). We subsequently add control variables in order to see how the other coefficients respond. Given that the government ideology measure from the DPI is not available for Switzerland the number of countries in models 5 to 8 is only 33 instead of 34.

Table 1. Two-way fixed effects estimations, 1984-2007 averaged over five periods, 34 countries

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8
<i>Dependent variable:</i>								
<i>In-kind share of social expenditures</i>	FE	FE	FE	FE	FE	FE	FE	DYN
Corruption	1.357** (2.139)	1.364** (2.149)	1.253** (2.050)	1.256** (2.025)	0.888* (1.843)	0.847* (1.788)	0.740* (1.659)	1.000* (1.677)
Share of old people		0.055 (0.142)	0.159 (0.424)	0.156 (0.403)	0.172 (0.579)	0.140 (0.479)	-0.030 (-0.108)	-0.026 (-0.084)
Share of young people		0.504** (2.241)	0.571*** (2.630)	0.569** (2.446)	0.348* (1.913)	0.309* (1.724)	0.044 (0.234)	-0.150 (-0.507)
Social expenditures/GDP			-0.487*** (-3.413)	-0.487*** (-3.397)	-0.416*** (-3.766)	-0.410*** (-3.787)	-0.441*** (-4.063)	-0.431** (-2.567)
Inflation rate				0.001 (0.024)	0.005 (0.304)	0.008 (0.477)	0.004 (0.150)	0.120 (1.469)
Government ideology					-0.499 (-1.491)			
Right-wing government						1.691*** (2.723)	0.910 (1.544)	-0.187 (-0.228)
Log of real GDP per capita							-14.576*** (-4.806)	-9.832** (-2.190)
Lagged dependent variable								0.876*** (10.538)
Observations	146	146	146	146	138	138	135	108
Countries	34	34	34	34	33	33	33	33

[1] All estimations include dummies for the different time periods

[2] Hypothesis tests are based on panel-corrected standard errors that are robust to heteroscedasticity and autocorrelation

[3] Stars indicate significance at 10% (*), 5% (**) and 1% (***)

[4] t-statistics in parentheses

First of all, it should be noted that for all eight models a positive corruption coefficient is found, which is in line with our main hypothesis for the case of democratic countries. This effect is significant at the 5% or 10% level, while the coefficient ranges from about 0.7 to 1.4. This means that an increase on the corruption index scale by one unit (one sixth of the scale) would lead to an increase in the in-kind share of

social expenditures by 0.9 to 1.4 percentage points. In model 8, we have experimented with a dynamic specification that includes a lagged dependent variable. The results are very similar to models 1 to 7. We have chosen to estimate this model with Bruno's (2005a, 2005b) bias corrected least squares dummy variable estimator that has been designed for unbalanced dynamic panel data models with small N.²⁷

With regard to the other control variables, we can say that the extent of redistribution is negatively correlated with the in-kind share of social expenditures, while the coefficients for the inflation rate and government ideology have the expected sign but are insignificant. When we use a right-wing government dummy instead of the 1-2-3 measure for government ideology, we find that indeed right-wing governments rely more often on in-kind redistribution than centrist and left-wing governments. In addition, we can confirm Barse et al.'s (2000) hypothesis that poor countries allocate a higher share of social transfers in-kind than rich countries.

In a second set of estimations (see Table 2), we have subdivided the 34 OECD countries into countries with the highest score of the three democracy indices (models 4.2, 4.4, and 4.6) and countries that have a score that is lower than this highest value (models 4.1, 4.3, and 4.5). In particular, we find that 20 of 34 countries do have the value of 7 for the political rights index, while the same is true for the civil liberties index for 11 of 34 countries. Finally, nine countries (Australia, Canada, Denmark, Finland, Iceland, Netherlands, Norway, New Zealand, and Sweden) have the highest score possible for the ICRG democratic accountability index.²⁸

In the models summarized in Table 2, the positive coefficient of the corruption index is only significant for the countries with the highest scores of the three democracy indices (except for the high political rights sample where the t-statistic is only 1.4²⁹). Hence, the significant results identified in Table 1 are driven by the countries with the highest possible extent of democracy observed worldwide. For the "moderately democratic" countries in the OECD, the sign of the coefficient is negative, even though the t-statistics show that these effects are insignificant. This finding provides additional support to the theoretical considerations in the previous section. Hence, even a slight deviation from the highest

²⁷ We use the Blundell-Bond (1998) estimator as the initial estimator, where the instrument set is collapsed in line with Roodman (2006). Following Bloom et al. (2007) we undertake 70 repetitions for the bootstrapping of the standard errors.

²⁸ This subdivision of the sample also allows us to test whether South Korea, which belongs to the low-democracy subsample, drives the positive correlation between the in-kind share and corruption as Figure 5 may suggest.

²⁹ The political rights index captures whether people can participate freely in the political process, including the right to vote freely for distinct alternatives in legitimate elections, compete for public office, join political parties and organizations, and elect representatives who have a decisive impact on public policies and are accountable to the electorate. The civil liberties index measures the freedoms of expression and belief, associational and organizational rights, rule of law, and personal autonomy without interference from the state. Democratic accountability is a measure of how responsive government is to its people, on the basis that the less responsive it is, the more likely it is that the government will fall, peacefully in a democratic society, but possibly violently in a non-democratic one.

observed extent of democracy means that voters are less able to tie the hands of corrupt politicians with a higher in-kind share of social transfers.³⁰

Table 2. Two-way fixed effects estimations, 1984-2007 averaged over five periods, 33 countries, subsamples of fully versus moderately democratic countries

	Model 4.1	Model 4.2	Model 4.3	Model 4.4	Model 4.5	Model 4.6
<i>Subsamples</i>	<i>Low score political rights index</i>	<i>High score political rights index</i>	<i>Low score civil liberties index</i>	<i>High score civil liberties index</i>	<i>Low score democratic accountability</i>	<i>High score democratic accountability</i>
<i>Dependent variable:</i>						
<i>In-kind share of social expenditures</i>						
Corruption (ICRG)	-0.398 (-0.81)	0.854 (1.40)	-0.035 (-0.09)	2.435*** (2.41)	-0.016 (-0.04)	3.485*** (3.00)
Share of old people	0.279 (0.71)	1.064*** (2.83)	-0.204 (-0.74)	2.427*** (4.01)	-0.098 (-0.38)	1.603*** (2.75)
Share of young people	0.341 (1.07)	0.346* (1.76)	-0.191 (-0.87)	1.847*** (3.96)	0.181 (1.12)	1.215** (2.4)
Social expenditures/GDP	-1.286*** (-4.15)	-0.212** (-2.24)	-0.951*** (-4.66)	0.046 (0.047)	-1.247*** (-7.91)	0.234** (2.23)
Inflation rate	-0.013 (-0.33)	0.037 (0.81)	0.032 (1.28)	-0.184* (-1.89)	0.016 (0.64)	-0.134 (1.25)
Right-wing government	4.543*** (3.26)	-0.176 (-0.33)	1.992*** (2.81)	-0.397 (-0.07)	1.456** (2.29)	-0.371 (-0.61)
Log of real GDP per capita	-15.824*** (-3.69)	7.933* (1.89)	-22.516*** (-7.41)	15.897*** (3.04)	-19.284*** (-7.24)	-5.846 (-0.63)
Observations	52	86	84	54	94	44
Number of countries	13	20	22	11	24	9

[1] All estimations include dummies for the different time periods

[2] Hypothesis tests are based on panel-corrected standard errors that are robust to heteroscedasticity and autocorrelation

[3] Stars indicate significance at 10% (*), 5% (**) and 1% (***)

[4] t-statistics in parentheses

For the remaining control variables, we find a negative and significant coefficient for the social expenditure-to-GDP ratio in all but one model, which confirms our finding in Table 1 that a higher total extent of redistribution is associated with a lower in-kind share of social transfers. On the other hand, for the inflation rate the coefficient is only in one case significantly negative at the 10% level. Finally, in three out of six models we find evidence that governments that exhibit a more “leftist” or centrist ideology tend to provide a higher cash rather than in-kind share of social transfers compared to right-wing governments.

As a final step, we acknowledge the fact, that independent of the level of democracy there may be some (additional) variation in the exact nature of political institutions across the countries in our sample.

³⁰ Similarly, Aidt et al. (2008) and Méndez and Sepúlveda (2006) look into the role of political accountability or political freedom, respectively, as a determinant of corruption and economic growth and find nonlinearities in the corruption-growth relation depending on the quality of the political institutions.

In particular, we are interested in those factors that strengthen voters' power over politicians and the extent to which politicians can be held accountable for potential wrong-doings.

Table 3. Two-way fixed effects estimations, 1984-2007 averaged over five periods or 1984-2007 cross-country estimations, 33 countries, characteristics of political system

	Model 15	Model 16	Model 17	Model 18	Model 19	Model 20
<i>Dependent variable:</i>						
<i>In-kind share of social expenditures</i>						
Corruption	-4.317 (-1.550)	-12.521*** (-2.915)	-12.081 (-1.288)	2.833 (0.923)	3.641 (1.408)	1.626 (0.353)
Social expenditures/GDP	-0.560*** (-4.136)	-0.537*** (-3.231)	-0.451* (-2.012)	-0.975*** (-3.970)	-0.629** (-2.324)	-0.588** (-2.204)
Inflation rate	0.022 (0.404)	0.075 (1.423)	0.039 (0.533)	0.082 (1.118)	0.052 (0.590)	0.069 (0.768)
Right-wing government	0.731 (1.319)	0.130 (0.209)	2.199 (0.436)	7.271 (1.418)	2.035 (0.337)	2.984 (0.469)
Share of old people	0.052 (0.174)	0.409 (1.118)	-4.480*** (-4.565)	-3.032*** (-2.884)	-4.118*** (-3.286)	-3.629*** (-3.134)
Share of young people	-0.249 (-1.075)	-0.422 (-1.281)	-2.947*** (-4.008)	-1.767** (-2.628)	-2.499*** (-3.203)	-2.219*** (-2.895)
Log of real GDP per capita	-17.903*** (-4.876)	-17.555*** (-3.234)	10.634** (2.236)	8.139 (1.664)	8.309 (1.453)	8.464 (1.439)
Press freedom	-0.066 (-0.710)					
Corruption*Press freedom	0.059 (1.638)					
Voice & accountability		-7.890** (-2.205)				
Corruption*Voice & accountability		3.559*** (2.981)				
Independent judiciary			-62.667** (-2.419)			
Corruption*Independent judiciary			14.774 (1.542)			
Closed list				-14.014** (-2.463)		
Corruption*Closed list				1.905 (0.616)		
Presidential system					-9.485 (-0.582)	
Corruption*Presidential system					2.887 (0.430)	
Party polarization						-4.605 (-0.965)
Corruption*Party polarization						1.011 (0.321)
Observations	117	92	33	29	33	33
Countries	33	33	33	29	33	33

[1] The estimations for models 15 and 16 include dummies for the different time periods

[2] Hypothesis tests for models 15 and 16 are based on panel-corrected standard errors that are robust to heteroscedasticity and autocorrelation

[3] Stars indicate significance at 10% (*), 5% (**) and 1% (***)

[4] t-statistics in parentheses

For two of these measures (Freedom House's Press Freedom Index and the World Bank's Voice and Accountability Index), there is variation over time which allows us to exploit the panel structure of the dataset as in the previous estimations (models 15 and 16). However, for the other four measures (Henisz' independent judiciary dummy, DPI's closed list, presidentialism, and party polarization measures) there is hardly any variation over time. Therefore, for models 17 to 20 we conduct a pure cross-sectional analysis with averages over 24 years.

The hypothesis that we want to investigate in Table 3 is whether there are certain characteristics of democratic political systems in OECD countries, which allow voters even more to induce an increase in the in-kind share of social transfers when faced with corruption. Hence, we try to get a more detailed picture of what constitutes - what we call - a well-functioning "democracy" in the real world.

In model 15, we find indeed a positive coefficient for the interaction term between press freedom and corruption. However, it has a t-statistic of only 1.64 and is therefore not significant at conventional levels. On the other hand, we do find a significantly positive coefficient for the interaction term between the World Bank's Voice and Accountability Index and corruption in model 16. This implies that the extent to which a country's citizens are able to participate in selecting their government, as well as freedom of expression, freedom of association and a free media do contribute to a higher in-kind share of social transfers in countries with a high extent of corruption.

For model 17 we again find a positive coefficient for the interaction term. Yet the t-statistic is slightly below the 10% with $t = 1.54$. Hence, there is only weak evidence that an independent judiciary allows for a more effective control of voters over the composition of social transfers. Finally, with regard to closed lists (model 18), presidential as opposed to parliamentary systems (model 19) and the extent of party polarization (model 20) we do not find any significant effects with regard to the relevant interaction terms.

To summarize, the empirical analysis in Section 3 of this paper provides evidence for the theoretical considerations in the preceding section of this paper. In particular, we find in a two-way fixed effects analysis for 34 OECD countries over the 1984-2007 period that in "democratic" OECD countries a higher extent of corruption is positively correlated with the in-kind cash share of social transfers.

4. Conclusion

The theoretical literature provides a number of arguments in favor and against the cash or in-kind provision of social transfers. This paper shows that there is another benefit of in-kind transfers neglected so far: in-kind transfers can be used as a monitoring instrument by voters. With monetary transfers, voters are less easily able to observe who receives benefits and how much they receive. When transfers are provided in-kind, it is much easier to verify who benefits from them. It is rather unlikely that corrupt politicians would feel tempted to appropriate public resources by lining up for basic health care, moving into public housing facilities or redeeming food stamps in the supermarket.

These considerations are confirmed in the regression analysis for 34 OECD countries over the time period from 1984 to 2007. We find that in democratic OECD countries voters have the political power to make sure that the in-kind share of social transfers is higher when there are higher levels of corruption. When drawing a distinction between “fully” and “moderately” democratic countries according to three different widely used democracy indices, we find that the significant effects observed for the entire sample are driven by the “fully” democratic countries. Finally, we find some evidence that particular characteristics of a democratic political system make it more likely that voters can induce a higher in-kind share of social transfers in the presence of corruption. This includes the extent to which citizens are able to participate in selecting their government, as well as freedom of expression, freedom of association and a free media. There is weak evidence that this may also be true in countries where there is an independent judiciary.

Appendix A: Derivations

Proof of Proposition 2:

Part (i) of the proposition is straightforward. If there are no corrupt politicians and if we assume that transfers can be targeted to the poor, the total amount of tax revenues is transferred to the low-income group with monetary transfers. Hence, monetary transfers guarantee the first-best utility level for all transfer levels t , i.e. $V_L^M(\underline{Y} + (1 - \pi)t\underline{Y}) = V_L^*(t\underline{Y}, \underline{Y})$ with $\pi = 0$.

For part (ii) of the proposition, let us assume that there is one transfer level t' within the relevant transfer levels where the publicly provided quantity is equal to the quantity demanded with monetary transfers and so is the consumption of good x . It follows that at this transfer level t' , in-kind transfers lead to the same utility level as monetary transfers, i.e. $V_L^M(\underline{Y} + (1 - \pi)t'\underline{Y}) = V_L^I(t'\underline{Y}, \underline{Y})$ with $\pi = 0$, which corresponds to the first-best level according to (i). Increasing (decreasing) the transfer level means that the demand for both goods is increasing (decreasing) with monetary transfers whereas in-kind transfers pose a restriction on the consumption bundle. Hence, this policy can only be equivalent to the first-best if this restriction is not effective. For well-behaved preferences, there is only the transfer level t' where public provision is the first-best instrument.

Derivation of Threshold Q

Threshold Q is defined by

$$Q \equiv V_L^M(\underline{Y} + (1 - \pi)t\underline{Y}) - V_L^I(t\underline{Y}, \underline{Y}) = 0. \quad (A1)$$

Using the Cobb-Douglas utility function (1), the corruption level for which (A1) holds as an equality is (cf. (12))

$$\pi = 1 - \frac{t^\alpha - A}{At}. \quad (\text{A2})$$

The sign of the threshold's slope is obtained by total differentiation of (A2)

$$\left. \frac{d\pi}{dt} \right|_{Q=0} = \frac{\alpha t^{\alpha-1} - t^\alpha + A}{At^2} \begin{cases} > \\ = \\ < \end{cases} 0 \Leftrightarrow t \begin{cases} < \\ = \\ > \end{cases} t'. \quad (\text{A3})$$

The slope is thus equal to zero at the transfer level t'

$$t' = \frac{\alpha}{1-\alpha}, \quad (\text{A4})$$

which follows from (A3) making use of (4).

Derivation of Threshold K

The optimal fraction γ^* is obtained by the solution of the maximization problem in equation (10)

$$\gamma^* = \alpha \frac{(1-\pi)t+1}{(1-\pi)t}. \quad (\text{A5})$$

Policy *IM* is equivalent to policy *I*, where γ^* reaches the upper bound ($\gamma^* = 1$), i.e.

$$\pi = 1 - \frac{\alpha}{1-\alpha} \frac{1}{t}. \quad (\text{A6})$$

The slope of the threshold line *K* is obtained by differentiating (A6)

$$\left. \frac{d\pi}{dt} \right|_{K=0} = \frac{\alpha}{1-\alpha} \frac{1}{t^2} > 0. \quad (\text{A7})$$

A comparison of threshold *Q* and threshold *K* shows that the threshold line *Q* lies below the threshold line *K* in the relevant transfer range ($t > t'$).

Appendix B: Data description

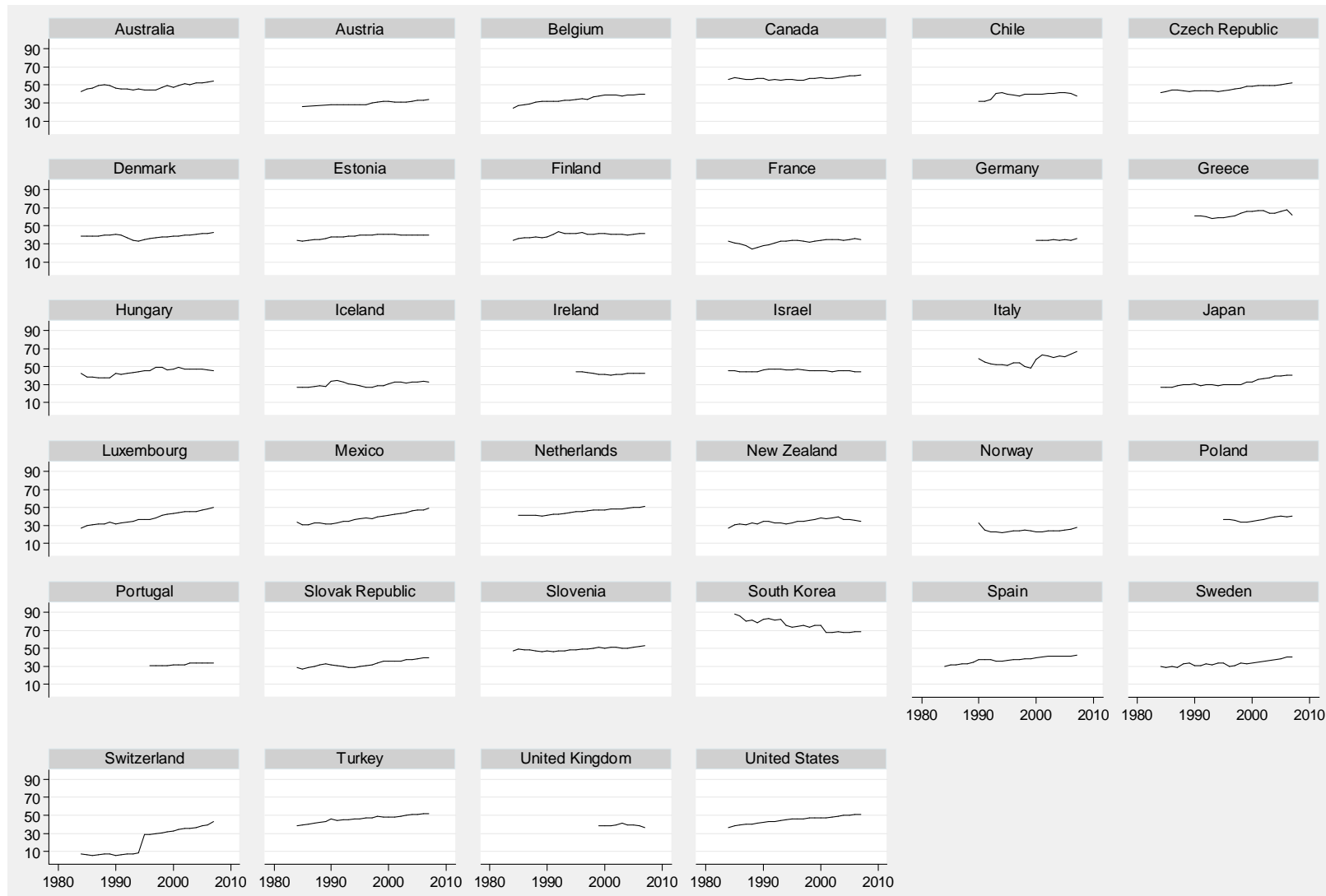
Table 4. Definitions and sources of variables

Variable	Description	Source
<i>Dependent variable</i>		
In-kind share of social transfers	Share of social transfers that have been paid in kind to recipients rather than in cash	OECD Social expenditures (SOCX) database
<i>Explanatory variables</i>		
Corruption (ICRG)	ICRG Index for corruption as perceived by foreign investors on a reversed scale from 0 (least corrupt) to 6 (most corrupt)	International Country Risk Guide
Social expenditures/GDP	Total social expenditures as a share of GDP	OECD Social expenditures (SOCX) database
Share of old people	Population share of people older than 65	OECD Annual Labor Force Statistics
Share of young people	Population share of people younger than 15	OECD Annual Labor Force Statistics
Log of real GDP per capita	Log of real GDP per capita	OECD Main Economic Indicators
Inflation rate	Growth rate of Consumer Price Index	OECD Main Economic Indicators
Government ideology	Categorical dummy (1 = right-wing, 2 = centrist, and 3 = left-wing) for ideology of chief executive's party	DPI (Beck et al., 2001)
Right-wing government	Dummy for right-wing governments	DPI (Beck et al., 2001)
Political Rights Index	Inverted scale from 1 (least free) and 7 (most free)	Freedom House
Civil Liberties Index	Inverted scale from 1 (least free) and 7 (most free)	Freedom House
Democratic accountability (ICRG)	Multi-dimensional index that captures how responsive a government is to its people measured on a scale from 0 to 6	International Country Risk Guide
Press freedom	Index based on an annual survey of media independence scaled from 0 (most free) to 100 (least free)	Freedom House
Voice and accountability (World Bank)	Index that captures perceptions of the extent to which a country's citizens are able to participate in selecting their government, as well as freedom of expression, freedom of association and a free media on a scale from -2.5 to +2.5	World Bank Governance Indicators
Independent judiciary	Dummy variable coded 1 if there is an independent judiciary	POLCON database (Henisz, 2006)
Closed list	Dummy for electoral systems with a closed list	DPI (Beck et al., 2001)
Presidential system	Dummy for presidential systems	DPI (Beck et al., 2001)
Political polarization	Maximum difference between the left-right-center orientation of the chief executive's party and the placement of the three largest government parties and the largest opposition party	DPI (Beck et al., 2001)

Table 5. Summary statistics for non-averaged data

Variable		Mean	Std. dev.	Minimum	Maximum	Observations
In-kind share of social transfers	Overall	40.850	11.618	5.690	87.740	713
	Between		10.825	21.773	75.658	34
	Within		4.323	24.768	62.022	20.971
Corruption (ICRG)	Overall	1.462	1.194	0	4	767
	Between		0.988	0	3.327	34
	Within		0.701	-0.433	3.570	22.559
Social expenditures/GDP	Overall	18.619	6.963	0	35.688	726
	Between		6.415	4.517	30.291	34
	Within		3.026	-1.026	26.781	21.353
Share of old people	Overall	12.884	3.468	3.929	20.906	816
	Between		3.273	4.761	17.491	34
	Within		1.272	7.867	18.814	24
Share of young people	Overall	20.753	5.182	13.553	42.811	816
	Between		4.766	15.629	35.726	34
	Within		2.185	14.631	28.262	24
Log of real GDP per capita	Overall	9.889	0.455	8.469	11.084	756
	Between		0.427	8.978	10.680	34
	Within		0.184	9.116	10.455	22.235
Inflation rate	Overall	12.384	58.893	-0.895	1281.444	780
	Between		22.941	0.729	119.127	34
	Within		54.267	-104.285	1174.701	22.941
Government ideology	Overall	1.932	0.940	1	3	725
	Between		0.539	1	3	33
	Within		0.797	0.143	3.766	21.970
Right-wing government	Overall	0.475	0.427	0	1	725
	Between		0.287	0	1	33
	Within		0.326	-0.205	1.154	21.970
Political Rights Index	Overall	6.656	0.907	2	7	778
	Between		0.643	4.75	7	34
	Within		0.637	2.781	8.364	22.882
Civil Liberties Index	Overall	6.350	0.978	3	7	778
	Between		0.778	3.792	7	34
	Within		0.587	3.725	7.850	22.882
Democratic accountability (ICRG)	Overall	5.389	0.959	1.571	6	692
	Between		0.638	3.701	6	34
	Within		0.708	2.741	7.1804	20.353
Press freedom	Overall	79.782	11.556	26	95	510
	Between		11.022	40.933	92.267	34
	Within		3.926	56.249	92.116	15
Voice and accountability (World Bank)	Overall	1.175	0.430	-0.676	1.827	306
	Between		0.421	-0.273	1.603	34
	Within		0.112	0.586	1.443	9
Independent judiciary	Overall	0.897	0.304	0	1	775
	Between		0.215	0.048	1	34
	Within		0.221	-0.062	1.850	22.794
Closed list	Overall	0.634	0.482	0	1	651
	Between		0.485	0	1	30
	Within		0.074	0.034	1.034	21.7
Presidential system	Overall	0.147	0.354	0	1	777
	Between		0.329	0	1	34
	Within		0.126	-0.687	0.938	22.853
Political polarization	Overall	1.130	0.914	0	2	732
	Between		0.673	0	2	33
	Within		0.636	-0.620	3.047	22.182

Figure 6. Evolution of in-kind shares of social expenditures: 34 OECD countries, 1984-2007



Source: OECD SOCX Database

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