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THE POLITICAL ECONOMY OF ATTRACTING
PUBLIC FUNDS: THE CASE OF LEBANON

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Send correspondence to:
Nisreen Salti
Department of Economics, American University of Beirut
Email: nisreen.salti@aub.edu.lb

Abstract:

Using a new exceptional dataset on 80 poverty pockets in Lebanon in 2004, we propose to test the confessional and political channels of influence through which these pockets are potentially able to attract development assistance. Lebanon constitutes a perfect case study for the interaction of identity-based polarization and fractionalization (based on confession) and poverty in the context of a developing country. We investigate the effect on the level of development assistance funds transferred to municipal governments of polarization, fractionalization and sectarian distance at the level of the poverty pockets and find robust results indicating that polarization and fractionalization are significant determinants of a pocket's ability to attract funding. We also find that one of our measures of sectarian distance, the share in the larger district of a poverty pocket's largest sect, also generates more revenue for the pocket. Pockets with a mix of sects have greater ease in attracting funds, which is consistent with the prerogative of confessional balance in government policy dictated by the power-sharing game in the post-war era. The results are robust to the inclusion of a wide variety of controls. They put into question the design of effective channels to allocate development funds in polarized societies.

ملخص

باستخدام مجموعة بيانات استثنائية في 80 زقاق فقير في لبنان عام 2004، نقترح ان نقوم باختبار القنوات الطائفية والسياسية ذات التأثير والتي تستطيع هذه الأزقة عن طريقها اجتذاب المساعدات الإنمائية . تمثل لبنان حالة مثالية لدراسة تفاعل الاستقطاب القائم على الهوية (المبني على الطائفة) والفقر في سياق دول نامية. ندرس تأثير الاستقطاب، على مستوى الزقاق الفقير، ونجد أن قدرة الزقاق على اجتذاب الأموال الإنمائية تثبت إيجابيتها باستمرار. نجد أيضا أن واحدا من القياسات المستخدمة لدينا وهو حصة الفقر لأكبر زقاق لأكبر طائفة يولد أيضا المزيد من العائدات للزقاق. الأزقة ذات الطوائف المتعددة لديها سهولة أكبر في اجتذاب الأموال ، وهو ما يتسق مع حق التوازن الطائفي في سياسة الحكومة والتي تمليها لعبة تقاسم السلطة في حقبة ما بعد الحرب. والنتائج التي تم الوصول إليها قوية بالنسبة لمجموعة متنوعة من تقنيات التقدير والمواصفات.

1. Introduction

The efficiency and equity of public development aid allocation has always been at the centre of public policy debates. This is even more the case in countries characterized by a highly heterogeneous social fabric, with ethnic, sectarian, or wealth divisions imposing additional constraints on the distribution of aid funds. This paper sets out to explore the determinants of the allocation of public development expenditures in the context of polarized societies, with an application to the Lebanese case.

Lebanon's Ta'if Accords, the power-sharing agreement that brought an end to the country's fifteen years of civil war, divided power along sectarian lines according to a formula that was devised to preserve sectarian balance at all levels of public life. Unfortunately, the practical implementation of this imperative of confessionally balanced policy was more akin to an exercise of pie slicing among the different confessional groups, according to the proportions agreed upon in the Ta'if Accords or the subsequent consensual interpretations of its text. Thus the post-war period saw, instead of a consolidation of state powers and a re-building of state institutions, a fragmentation of the state apparatus and the piecing out of public authorities and functions to various sect leaders in a perverted form of power-sharing.

In light of the way that the political power-sharing game has been played out, and the opportunities for corruption and waste (Dibeh, 2005, Adwan, 2004) that treading the tightrope of confessional balance entailed, Salti and Chaaban (2010) found it worthwhile to investigate the profile of public spending by the government in the post-war period. They first attempt to reckon records of public spending with standard indicators of regional disparities, in an effort to evaluate the rationality of the spending decisions. They then assess the effectiveness of public funds by looking at various regional indicators of post-spending outcomes. Salti and Chaaban (2010) conclude that spending decisions are neither justified on the basis of need, nor are they effective at achieving their presumed objectives. Finally, they put forward a conjecture that public social spending, like other forms of public decision making, subscribes to the same power-sharing rule that imposes a sectarian balance reflecting the demographic composition of the country overall, and they find that the data is consistent with the conjecture. Breaking regions down into their sectarian demographic makeup creates a sectarian accounting of overall public spending, and the authors find that this accounting closely mirrors the demographic composition of the country overall.

In the vein of the conjecture put forward by Salti and Chaaban (2010), we propose to investigate more closely the effect of demographic composition on an administrative locality's ability to affect the amount of public funding it receives from the central government budget. Using two new exceptional datasets, one on 80 poverty pockets in Lebanon in 2004 and the other on the municipal distribution of public funds for development, we propose to test the confessional and political channels of influence through which these pockets are potentially able to attract development assistance; and then evaluate the effectiveness of this assistance in eradicating absolute poverty. We take each of the 80 poverty pockets as the unit of observation and propose to estimate the factors affecting the resources allocated to each pockets in the context of the political economic game among these pockets. Thus, unlike Salti and Chaaban (2010), the unit of observation is far more local than the overall country, and allows us to determine whether confessional composition is able to affect the distribution of public funds, and whether this effect works at the disaggregated level of individual towns.

The paper is organized as follows: section 2 reviews the related literatures; section 3 describes the level of economic disparity across Lebanese governorates, section 4 describes

and summarizes the datasets we will be using; section 5 presents the results of our empirical analysis and section 6 concludes and presents some policy recommendations.

2. Literature Review

This study aims at providing a detailed empirical analysis of the political economic determinants of the relative local and regional power of highly deprived communities in the allocation of development funds. The context of a highly polarized society introduces exogenous identity-based factors to the determination of relative local influence and has significant bearing on the flow of funds to various communities.

While a theoretical and empirical literature exists on distributional conflict in intra-regionally heterogeneous recipient communities (see, for example, Galasso and Ravallion, 2005, and Bardhan and Mookherjee, 2005), to our knowledge, there has been no empirical treatment of the determinants of inter-regional allocations in divided societies.[1]

Given this, the literature on the effects of ethnic fractionalization on a public goods provision is extensive. Easterly and Levine (1997) use cross-country data and find a robust negative relationship between public goods and ethnic diversity. Betancourt and Gleason (2000) find that in India, constituencies with a higher fraction of traditionally disadvantaged casts and Muslims receive lower public spending in health and education. Banerjee and Somanathan (2007) find similar results in that more tribally fractionalized regions have a considerably lower provision of public goods.

Alesina, Baqir and Easterly (1999)'s seminal work investigates the provision of public goods in ethnically divided communities in an industrialized country context. While we are able to include among our determinants of local community-level power the extent of fractionalization of each of the poverty pockets we investigate, like Alesina, Baqir and Easterly (1999) do, we are also concerned with the particular confessional characteristics of our units of observation in relation to the confessional characteristics of regional and national power divisions. We thus introduce, in addition to a measure of fractionalization of each of our pockets, a measure of sectarian "distance" between the sectarian makeup of the pocket and that of the larger district, which is the administrative level of legislative representation, and therefore the level at which budgetary allocations get negotiated.

Furthermore, our analysis is in a developing country context, which exhibits at once more severe poverty levels and sharper income inequality than an industrialized society like the one investigated by Alesina, Baqir and Easterly (1999).

In addition, this paper hopes to contribute to a related but distinct empirical literature, which is the literature on the effect of polarization on economic outcomes. Recently, a literature has developed comparing the effects of polarization and fractionalization. Montalvo and Reynal-Querol (2005) find a significant relationship between ethnic polarization and the incidence of conflict, and Collier and Hoeffler (2004) argue that the contested dominance of one large group increases the probability of civil strife, while Schneider and Wiesehomeier (2006) find that fractionalization is a better predictor of conflict than polarization. Thus we use the polarization measure developed in Esteban and Ray (2008) to calculate a polarization index for each of our 80 poverty pockets.

3. Disparities in Lebanon

Lebanon constitutes a perfect case study for the interaction of identity-based polarization (based on confession) and poverty in the context of a developing country. In addition to its

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[1] Other effects of social divisions, namely on education and political violence, have been explored in Hajj and Panizza (2006) and Krueger and Maleckova (2002).

long-standing and deeply rooted sectarian divisions, Lebanon has been historically characterized by high economic and social differences between its major cities and its rural peripheries. In 2004, the poverty rate in the poorest mohafaza (governorate) was 5 times higher than in the capital, Beirut (UNDP, 2007).

The World Bank (2005) claims that "there is ample evidence to suggest that geographical allocations of public resources are driven by political rather than equity considerations." We set out to examine whether at the level of 80 poverty pockets scattered all around Lebanon, the sectarian makeup of the pockets' residents has any effect on the pockets' ability to attract development funds targeting municipalities. We start by taking a closer look at the extent of inequality in the country overall as well as the extent of regional disparities in measures of economic wellbeing.

Inequality is illustrated by the Lorenz curve for private consumption expenditures shown in Figure 1. The figure, taken from UNDP (2007), shows that the share of overall consumption of each income decile is far below the equality line.

UNDP defines an index of satisfaction of basic needs in conducting its poverty analysis, which takes into account aspects of economic welfare that are not captured by income and incorporates education, health and housing. Table 1 below shows that the governorate with one of the highest shares of residents with low satisfaction of basic needs (North Lebanon) has the lowest share of poor residents who benefit from social assistance programs. And conversely, the capital, which has the lowest share of residents with low satisfaction of basic needs also boasts the highest share of beneficiaries of social assistance programs amongst its poor.

Table 2 reports the mean and median consumption expenditures per capita for each governorate to shed light on the extent of inequality both within and across governorates. Beirut has, unsurprisingly, the highest mean and median levels of consumption per capita and North Lebanon shows the lowest. It is also a governorate where the relative distance between mean and median is the second largest in the country. Whereas the district with the smallest such relative difference (Nabatieh) has a lower level of consumption per capita than the overall country.

It is within this setup of a developing middle income country with high regional income disparities that we conduct our empirical exercise, as emerging evidence suggests that these disparities might be the result of a political economic allocation game, where confessional polarization might be playing an important role.

4. Data

In our empirical exploration we resort to three types of data: first, indicators of poverty and need at the community level; second, data on various development funds disbursed to these communities; and third, information on the sectarian composition at the community and regional levels.

Poverty data

The Economic and Social Fund for Development (ESFD), an independent project in the Council for Development and Reconstruction (CDR) initiated a Community Development Unit in 2004 which aimed at social development, which the ESFD Strategy report defined as:

> Coordinated efforts by the public sector, the business sector and the civil society to eliminate poverty, provide access to affordable and adequate social services, decrease exposure to risks and disasters, reduce unemployment and emigration of valuable human resources in the context of balanced, comprehensive, equitable and sustainable economic growth in all regions. (ESFD, 2005).

In an effort to implement its social development strategy, ESFD used a two-layered approach to identify poverty pockets. ESFD started by constructing an Expenditure Composite Index (ECI) from readily available data (like electricity and phone bills). The ECI approach helped identify the governorates (*mohafaza*) and districts (*caza*) that are most vulnerable. An additional layer of information was added to the ECI through national, regional and local key informants that helped identify 80 pockets (73 in rural areas and 7 in urban areas) in the districts recognized through the ECI method.

A survey which collected socio-demographic and economic information on households was conducted in these 80 poverty pockets, the results of which we use in our analysis. To our knowledge, these data have not yet been used in the context of any economic research. While the dataset is smaller in size than the Multi Purpose Surveys of living conditions of households, conducted twice by the Ministry of Social Affairs (MOSA) and the United Nations Development Programme (UNDP) in 1997 and 2004-2005, it does present substantial advantages over the standard households surveys used in research on Lebanon.

The surveys are, by construction, not intended to be nationally representative. Instead, they offer a close-up on the conditions of the country's poorest villages and urban quarters. As such, it is data that is especially relevant for work on poverty alleviation. For our purposes, the data are of interest because the central question we seek to answer is whether a pocket is able to attract development assistance funding, which is clearly warranted in the case of these particular communities.

The second main import of the dataset is that unlike the public release versions of the MOSA and UNDP household surveys, this dataset makes available the income data that were collected and provide a substantially finer measure of geographical location.[2]

The ESFD dataset provides us with household level characteristics for households in each of the 80 poverty pockets, which we aggregate in our analysis to construct a dataset of poverty pockets. The ESFD data however have no measure of public funds or assistance to each of the pockets. The ESFD data also contains no record of the confessional composition of any of the poverty pockets.

Pocket-level funding

To get a measure of pocket-level funding, we combine several datasets, the principal one among them being data collected as part of the First Municipal Infrastructure Project (FMIP).[3] The project was financed through an US$80 million World Bank loan for the First Municipal Infrastructure Project (FMIP) and became effective in November of 2000. The project objectives consist of "*(i) restoring selected basic municipal infrastructure to improve the living conditions, primarily in municipalities previously deprived of such investments, and (ii) setting the stage for the development of the municipal sector by enabling municipalities to address local infrastructure needs and by providing municipalities with their share of intergovernmental transfers intended to promote capital investment*" (World Bank, 2000). We use data from the World Bank's record of transfers to municipalities as part of the FMIP and we match the total awards to each municipality to the 80 poverty pockets that are in the ESFD data.

We complement World Bank data on municipal funding with data from ESFD's Community Development Unit. The Community Development Unit establishes a close partnership with

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[2] The strata variable, the finest measure of geographical location in the MoSA/UNDP household surveys, contains only 15 regions, which puts the level of possible geographical identification in these most commonly used data in research on Lebanon at a level between districts and governorates.

[3] More information on the FMIP is provided in the data appendix.

the communities and municipalities it works with and defers to local communities in identifying the nature of the development projects it funds and provides technical support for.

We also include data from the first year of operation of the Municipal Capacity Building and Service Delivery project (TAMKIN) funded by the United States Agency for International Development.

Sectarian composition

We extract confessional composition data from the voting records from the parliamentary elections conducted in May of 2005. The ballots record the confession, gender, year of birth, administrative identification number and municipality of every eligible voter. While we acknowledge that sectarian composition of eligible voters is likely not identical to the sectarian composition of the entire population, given that the minimum voting age in Lebanon is 21, we maintain that the distribution of the population above 21 across the various Lebanese confessions is a reasonable approximation of the distribution of the overall population.

Summary statistics of the characteristics of the 80 poverty pockets which are this study's units of observation are presented in Table 3.

The receipts variable represents the outcome of interest for this empirical exercise. It is the sum of receipts from the World Bank funded FMIP project, the transfers from the Community Development Unit of ESFD and the USAID municipal capacity building project administered by the Rene Moawad Foundation. The average poverty pocket receives LBP218 million, which is close to $145,300. In per capita terms, the average pocket has received LBP224,815 per head ($150). The average population of a pocket (as proxied by the number of registered voters) is 3,070 residents.

The average household income is on the order of LBP800,000 per month, which is tantamount to about $533. In per capita terms, average monthly household income is on the order of LBP159,200, which is close to $106. Average individual income in these communities lies between the lower and upper poverty lines as estimated for Lebanon ($2.4 and $4 per day, UNDP 2007).

Keeping in mind that income measures suffer from substantial measurement error, we also report some of the other indicators of welfare and development. The average household size is close to 6, and the age of survey respondent is 27. Over a fifth of the individuals surveyed were illiterate. Another 26% failed to complete a primary school education. The average number of school years achieved is 5. Only 3% have completed secondary education. The average rate of unemployment among respondents is close to 29%. And close to 18% are covered by the National Social Security Fund (NSSF).

We also find that 40% of households surveyed own cars, the average size of a residence is around 89 square meters. Most of the residences surveyed have basic amenities: 70% have direct access to drinking water, 97% are connected to the public electric rid (although much like the rest of the country, they are also subject to a rationing in the hours of available electricity).

A key finding that is driving our paper's inquiry is exposed in table 4. We compute the receipt of the development funds listed above for our 80 poverty pockets, and tabulate this by their poverty status. We classify a community as very poor if its average income per capita is below 4 USD/day, which is the Lebanese upper poverty line for 2004. The findings are startling: while only half of the pockets (40) received development funds, only 24 of the very poor communities (totalling 54) ended up receiving funds. The under-coverage rate (or exclusion error) - defined as the proportion of very poor communities who should have

received funds - is as high as 75%. The leakage rate (inclusion error), which is computed as the proportion of non-poor communities who actually received funds, is 40%. These findings reveal a rather inefficient distribution system of development aid, with high exclusion and inclusion errors. This prompts the question of what is really driving the allocation of these funds; a question we try to answer in the remainder of this paper.

Table 5 looks at the sectarian composition of the 80 poverty pockets using election data from the voting records of the 2005 parliamentary elections. The figures in Table 6 are contrasted with the ones in Table 5, which present the same statistics for the overall districts (cazas) included in this study.

5. Analysis and Results

A. Description of variables

The primary goal of this paper is to identify the determinants of a poverty pocket's ability to attract development assistance funding in light of some of the recent findings on the determinants of the distribution of public funds for development on a national scale. We are therefore especially interested in testing the significance of the sectarian composition of the localities under study, as well as the significance of the distance between this composition and that of the district the locality is contained in, given that parliamentary representation, and therefore the ability to influence the central government's decision's process, happens at the level of districts.

We therefore start by calculating a sectarian fractionalization index for the poverty pockets in our data as well as the districts they're in. This index measures the probability that any two randomly selected individuals are of different sects. Thus in a society with G groups, with shares $n_1, n_2, ..., n_G$ in the overall population, the fractionalization index can be formalized as:[4]

$$F = \sum_i n_i (1 - n_i) = 1 - \sum_i n_i^2 \tag{1}$$

We find that the fractionalization index is around 7.6% on average for the poverty pockets, as reported in Table 7, far below the average fractionalization index for the districts containing these pockets of 41%, reported in Table 8.

We also calculate a polarization index, which conceptually, constitutes a "sum of interpersonal antagonisms", as formulated by Esteban and Ray (2008). They take antagonisms to be the "results from the interplay of the sense of group identification [...] and the sense of alienation [...] with respect to other groups" (Esteban and Ray, 2008). Esteban and Ray (1994) develop an indicator of polarization that is sensitive to group size (n_i) and intergroup distance (which they define as b_{ij}) according to the following formula:

$$P(\sigma, b) = \sum_i \sum_{j \neq i} n_i^{1+\sigma} n_j b_{ij} \tag{2}$$

where b is the matrix of intergroup distances and σ is a positive parameter that captures the extent of group identification. A special case of polarization where we formally set $\sigma = 0$ and assume groups to be equidistant from each other and we normalize this distance to be 1, so $P(0,1)$ reduces to the fractionalization index F developed in (1).

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[4] Some of the properties of F to note are: (i) a transfer of population from a group to a smaller group increases F; (ii) for a given G, F is maximized at the uniform population distribution; (iii) over the set of uniform distributions, F increases with G; (iv) in a group splits into two groups, F increases (Esteban and Ray, 2008).

We use a simplified version of the generalized polarization index described in (2). $P(1,1)$ as introduced by Reynal-Querol (2002). The underlying assumption is that groups are equidistant from each other, and the distance between them is normalized to 1 for simplicity:[5]

$$P(1,1) = \sum_i n_i^2 (1 - n_i) \tag{3}$$

The average score of the polarization index for the 80 poverty pockets is around 3.4%, in contrast with an average for the districts in question of 15%.

On average, the poverty pockets are therefore less fractionalized than the districts they lie in. This could be the result of the fact that the smaller is the unit of observation, the more likely G will be smaller than at the level of the district. Polarization, however, is also less severe in the poverty pockets than it is in the districts indicating that districts are likelier to have close proportions of the various groups than are the smaller poverty pockets.

We add to these measures of polarization and fractionalization two measures of sectarian distance defined as: the relative size in the district of the largest sect at the level of the poverty pocket (*distanceptod*), and conversely, the relative size in the poverty pocket of the largest sect at the district level (*distancedtop*). On average, the size in the district of a pocket's largest sect is 58%. The size in the poverty pocket of the largest sect in the corresponding district is close to 67%.

B. Regression analysis

The outcome variable that we seek to explain through regression analysis is the amount of development assistance funding that each locality is able to attract, as measured by our *receipts* variable. The basic regression equation is:

$$receipts\ per\ cap_i = \mathbf{a}_x \mathbf{w}_i + \mathbf{a}_z \mathbf{z}_i + \mathbf{c}\mathbf{x}_i + \varepsilon_i \tag{4}$$

Our regressions scale receipts by the population size of each poverty pocket and include, as explanatory variables $\mathbf{w}_i$, a host of welfare indicators that are relevant to development assistance. We also include $\mathbf{z}_i$, a vector of dummies for district as control variables. The vector $\mathbf{x}_i$ includes sectarian composition variables measuring polarization, fractionalization and sectarian distance. These variables include only pocket-level measures as district-level control variables rule out the inclusion of district-level measures of sectarian composition, such as the ones described in Tables 6 and 8 above.

Table 9 reports the results from running different versions of the regression described in equation (4), with the variables included in **w** and **x** changing from one column to the next. Columns (1) and (2) report the results from running the most basic regression of receipts per capita on three measures of pocket welfare or need (household income per head, average education and pocket level unemployment), where the **x** variable contains the polarization index in column (1) and the fractionalization index in column (2). Household income per head is significant at the 10% level, but positively related to receipts. There is no serious risk of reverse causality at play here because the bulk of the development assistance from the World Bank, all of the ESFD community development funds and the USAID municipal capacity building money are disbursed after the data on household incomes are collected. Neither education nor unemployment shows up as having significant effects on a pocket's

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[5] Some of the properties of $P(1,1)$ to contrast with the properties of F are: (i) a transfer of population from a group to a smaller one increases $P(1,1)$ if both groups are larger than $1/3$; (ii) for a given G, $P(1,1)$ is maximized when the population is concentrated on two equally sized groups only; (iii) over the set of uniform distributions, $P(1,1)$ decreases with G, provided $G > 1$; (iv) if a group splits into two groups, $P(1,1)$ increases if and only if $n \geq 2/3$ (Esteban and Ray, 2008).

ability to attract.[6] However both polarization and fractionalization turn out to have positive and highly significant effects on a pocket's ability to attract development funds: the more fractionalized or polarized the pocket, the likelier it is that it will attract funding. The magnitude of the effect is a 2 percentage point increase in the polarization index is associated with a LBP140,000 increase in receipts per capita, so roughly $92 extra dollars per head.

Next, we attempt to unpack this result by trying to understand the different possible political economy games that could be underlying the significance of fractionalization and polarization. Thus, it could be that fractionalization or polarization are just measuring heterogeneity in the sectarian composition of a poverty pocket, which makes it likelier that some segment of a pocket's residents is also represented at the level of the district. To test this, we include our sectarian distance variables in column (3) and we find that the share in the pocket of the majority sect in the district is not significant, whereas the share in the district of the pocket majority sect is significant (at the 5% level) and positively related to a pocket's ability to attract funding.

To test whether there is any residual effect of polarization or fractionalization beyond sectarian distance as measured by the share in the district of the pocket majority sect, we include sectarian distance and polarization in column (4). Now, the coefficient on sectarian distance is no longer significant, while polarization continues to have a highly significant and positive coefficient. Although the results from running such a regression are not reported here, we observe the same pattern if fractionalization were included in the regression instead of polarization.

In the following section devoted to checking robustness, we include a variety of other political measures to rule out the possibility that our fractionalization and polarization measures are actually standing in for other aspects of the confessional makeup of the poverty pockets in our data.

Next we try to include additional controls in the **w** variable to make sure that the results observed in the columns (1), (2) and (4) are not driven by the omission of variables that are central to the determination of the pocket-level receipts per capita. We start in column (5) by including socio-demographic characteristics about the households surveyed: household size, age and national security coverage. The results remain qualitatively similar to what we observed in the earlier regressions: none of the variables we've added to the $\mathbf{w}_i$ vector has a significant coefficient, and now the coefficient on household income per head loses its significance, whereas polarization remains a significant and positive determinant of pocket-level receipts.

Column (6) adds to the variables in column (5) characteristics of the surveyed residences (average size of a residence, its access to drinking water, connection to the public electric grid, sanitation), it also adds another measure of average household wealth (the ownership of a car) and welfare (a variable measuring the pocket-level illiteracy rates). Running the regression in column (6) yields results that are in line with the results observed in the other columns: most of the variables included in w are not significant, with the exception of the presence of sanitation and the illiteracy rate, both of which have positive coefficients. The coefficient on polarization remains highly significant and positive. The R^2 of the regression is, as expected, improved.

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[6] There is also no risk of multicollinearity among the independent variables, as partial correlation tests have shown that only income and education are weakly correlated, which is not a threat to the results of our model.

C. Robustness checks

Given the persistence of the significant results on polarization and the lack of consistent significant findings on the other control variables in **w**, we will use the specification in column (1) as our basic regression workhorse. Table 10 uses this workhorse but adds a different variables to the regression to check the robustness of the results observed in Table 9.

We start by testing the claim that polarization and fractionalization are measuring what we think they are measuring. We include, in turn, the share of every sect in the pocket in addition to polarization in order to make sure that it is not the presence of any single sect that is driving the results. In Table 10, we report the coefficients and their standard errors for the polarization index only and the share of the various sects. Two of the five major sects in the country come out as significant: the share of "other Christians" have a positive and significant effect on a locality's ability to attract funding while "Sunni" seems to have a significant negative effect on a locality's ability to attract funding. More relevant for our purposes is the fact that the coefficient of polarization remains significantly positive in all 5 regressions described in Table 10 indicating that our measure of polarization is not standing in for the presence of any particular sect.

Table 11 also uses the workhorse regression established in column (1) of Table 9 but varies the estimation technique used. We also only report the coefficients of interest in Table 11. Column (1) of Table 11 uses an alternative measure of polarization that we developed using a higher coefficient of group identification, which may be more suitable for Lebanon. We are still restricting ourselves to the family of polarization measures described in equation (2), but instead of using $P(1,1)$, we use $P(1.5,1)$. The results are qualitatively unchanged and polarization remains highly significant and positively related to a pocket's ability to attract development assistance.

Thus far, we have focused on polarization and have only included fractionalization in one of the regressions we've run in Table 9. However, all of the results (not reported here) are qualitatively almost identical when fractionalization is used instead of polarization. In column (2) of Table 11, we attempt to make the regression model choose between the two variables. Because the poverty pockets are very small in size (the average number of registered voters is 3,070), very few of the 80 pockets included contain a substantial fraction of more than 2 sects, and many pockets have an overwhelming majority of only one sect. This makes the correlation between the fractionalization index F and the polarization indexes $P(1,1)$ and $P(1.5,1)$ very close to 1. Thus because of high multicollinearity, neither of the coefficients turns out significant in the regression in column (2) and the model is ambiguous about which of the two measures is a better fit.[7]

Column (3) adjusts the regression to reflect the fact that the ESFD survey is not balanced across poverty pockets and uses the sample sizes from each pocket as weights. We are aware that the sample sizes in each pocket were not chosen by the survey designers according to sampling weights for representation purposes, we therefore take the results of column (3) with a grain of salt. The coefficient of polarization remains positive and significant but only at the 10% level.

Column (4) excludes the district level control variables we'd included throughout our analysis and instead includes a district level polarization measures as well as sectarian distance variables and estimates standard errors that are clustered by district. We first note the significant drop in R^2, as well as the loss of significance of all variables. This regression almost definitely suffers from omitted variable bias particularly since all of the previous

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[7] The model in regression (2) also attempts to estimate the effect of a change in the polarization index while the fractionalization is held constant, which is an exercise whose interpretation poses conceptual difficulties.

regressions run show that the dummy variables controlling for district are consistently jointly highly significant (and for the most part, individually significant also).

Column (5) includes the same variables as our workhorse regression, but runs a Tobit estimation instead, given that pocket-level receipts per capita are positive. The resulting coefficient on polarization remains highly significant and positive, and its magnitude is significantly higher.

Finally, column (6) uses log receipts per capita as the outcome variable it seeks to explain. However, because of the high frequency of zeros in our outcome variable, the resulting sample is halved and only 40 of the poverty pockets remain in the regression. Still, the result is qualitatively preserved, although its significance is now at the 10% level only.

We have also tested for possible selection bias in our model, by running a two-step Heckman selection model to control for the possibility that zero receipts of funds might be affecting our results. The estimation results of the model (not reported here) reject the possibility of selection bias in our regression.

6. Conclusion
We follow up on the findings of Salti and Chaaban (2010) about the sectarian distribution of public expenditure on a national scale in Lebanon and investigate, at a more local level, the transfer of funds from the central government to 80 municipal governments. We investigate the effect on the level of development assistance funds transferred to municipal governments of polarization, fractionalization and sectarian distance at the level of 80 poverty pockets in Lebanon and find consistent and robust results indicating that polarization and fractionalization are significant determinants of a pocket's ability to attract funding. We also find that one of our measures of sectarian distance, the share in the district of a poverty pocket's largest sect, also generates more revenue for the pocket. The results are robust to the inclusion of a wide variety of controls and to changes in the specification and estimation techniques.

Thus it would appear that the presence at the district level of a pocket's largest sect favours the pocket's chances at getting funding. Parliamentary representation in Lebanon is at the level of districts, thus this sectarian distance variable is measuring the extent to which a pocket's majority sect is likely to be included among a district's parliamentary representatives.

We also find that the effect of polarization persists even after controlling for sectarian distance and the share of each of the five major sects in the country. Pockets with a mix of sects seem to have greater ease in attracting funds, which is consistent with the prerogative of confessional balance in government decisions dictated by the power-sharing game in the post-war era.

These empirical results put into question the design of effective channels to allocate development funds in polarized societies. It seems, at least for the Lebanese context, that the allocation of public funds aimed at poverty alleviation is driven more by a 'balanced confessional' concern than by objective targeting based on economic needs.

11

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Figure 1: Consumption Shares, by Deciles
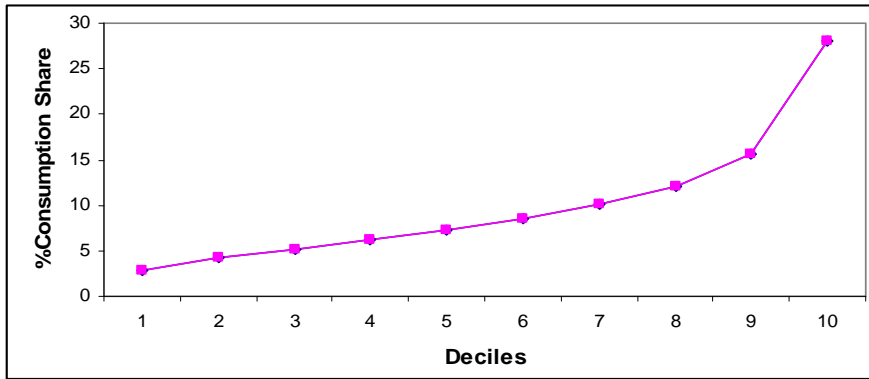
Source: UNDP and MoSA (2007) estimates based on CAS, UNDP and MoSA Living Conditions and Household Budget Survey (2004-2005)

Table 1: Beneficiaries Allocation among Mohafazat (Governorates)

Governorate	Population with low satisfaction of basic needs (poor)		Beneficiaries of social assistance	
	Share in Governorate	Total	Total	Share in poor
Beirut	19.2	78,221	8,211	10.5
Mount Lebanon	26.0	297,819	16,608	5.6
North Lebanon	48.9	327,928	5,555	1.7
South Lebanon	39.0	110,392	6,621	6.0
Bekaa	43.8	175,152	4,934	2.8
Nabatieh	51.4	105,581	1,832	1.7
All Lebanon	35.2	1,095,363	43,761	4.0

Source: World Bank, 2005.

Table 2: Mean and Median Consumption per Capita by Governorate (Mohafaza) (2004-2005) in Thousand LBP per Year

District	Private consumption expenditures per capita	
	Mean	Median
Beirut	6514	5240
Mount Lebanon	4512	3661
Nabatieh	3924	3349
Bekaa	3385	2747
South Lebanon	3007	2276
North Lebanon	2532	1933
All Lebanon	3975	3101

Source: UNDP and MoSA (2007) estimates based on CAS, UNDP and MoSA Living Conditions and Household Budget Survey (2004-2005). 1US$=1,500 LBP.

Table 3: Characteristics of the 80 Poverty Pockets

Variable	Obs	Mean	Std. Dev.	Min	Max
receipts	80	2.18e+05	4.72e+05	0	2.90e+09
receiptspc	80	224.815	847.347	0	7380567
population	80	3070.475	6917.561	71	41190
householdsize	80	5.942136	1.295447	3.5	9.683099
age	80	27.19065	4.900787	19.0138	40.55224
hhincome	80	763691.5	419749.1	71428.57	1971429
hhincpc	80	159202.3	101346.1	11111.11	507500
NSSF	80	.1812656	.2332399	0	1
educ	80	5.057355	2.248382	1.272727	10.1579
educmissing	80	.1041204	.0910512	0	.3829787
illiterate	80	.214194	.1336592	0	.4933333
belowprim	80	.2642428	.0845195	.0967742	.53125
primary	80	.1080685	.0772085	0	.375
belowint	80	.137795	.0989095	0	.4025974
intermediate	80	.0562213	.0563592	0	.1904762
belowsec	80	.0466705	.0452767	0	.2142857
secondary	80	.0283594	.043422	0	.2857143
tertiary	80	.0300807	.0482318	0	.2045455
highered	80	.0027099	.0106666	0	.0869565
voctech	80	.0075376	.0130256	0	.0705882
unemp	80	.287309	.2009347	0	1
size	77	89.24526	19.78583	41.625	120
drinkwater	80	.6902059	.336943	0	1
EDL	80	.9701666	.0875892	.4	1
electhours	77	13.74408	4.611209	4.4	24
sanitation	80	.181393	.3117902	0	.9862069
car	80	.3906993	.2570277	0	.9

Source: ESFD data (2004), World Bank (2005) and FRM data (2008).

Table 4: Receipt of Development Funds by Pockets' Poverty Status

	Did not receive funds	Received funds	Total
Non poor	10	16	26
Poor	30	24	54
Total	**40**	**40**	**80**

Source: Authors' calculations using ESFD data (2004), World Bank (2005) and FRM data (2008).

Table 5: Sectarian Composition of the 80 Poverty Pockets

```
    Variable    |    Obs       Mean    Std. Dev.      Min       Max
----------------+-------------------------------------------------------
     maronite   |     80    .054745    .2190848        0         1
other christian |     80   .0256163    .1116959        0     .8983
        sunni   |     80   .4242962     .465968        0         1
       shiite   |     80   .4541425    .4800071        0         1
        druze   |     80   .0338325    .1729978        0         1
----------------+-------------------------------------------------------
```

Source: Record of voters for the 2005 parliamentary elections, Ministry of Interior.

Table 6: Sectarian Composition of the Districts

District	Maronite	Other Christian	Sunni	Shi'ite	Druze	Other
Baabda	35.54%	15.51%	6.28%	25.24%	17.11%	0.01%
Saida	7.33%	9.19%	32.09%	51.12%	0.01%	0.04%
Akkar	10.24%	14.53%	69.38%	0.92%	0.01%	4.78%
Hasbayya	3.83%	9.62%	51.21%	1.79%	33.45%	0.00%
Tripoli	2.10%	7.59%	82.04%	1.07%	0.01%	6.81%
Minyeh-Denniyyeh	5.56%	6.61%	87.27%	0.14%	0.00%	0.05%
Nabatiyyeh	2.68%	0.89%	1.56%	94.63%	0.01%	0.01%
Marje'youn	4.68%	9.16%	3.43%	81.77%	0.82%	0.01%
Zahleh	16.46%	38.13%	28.46%	16.16%	0.50%	0.01%
Baalbek	8.19%	6.85%	16.83%	67.82%	0.01%	0.01%
West Beqaa	8.87%	14.84%	52.65%	22.96%	0.50%	0.00%
Hermel	1.18%	0.05%	3.06%	95.49%	0.00%	0.17%
Tyre	1.36%	4.63%	8.40%	85.45%	0.01%	0.00%
Bint Jbeil	8.54%	2.35%	0.75%	88.21%	0.01%	0.01%

Source: Information International SAL, (2007).

Table 7: Fractionalization and Polarization in the 80 Poverty Pockets

```
    Variable |        Obs        Mean    Std. Dev.        Min        Max
-------------+-------------------------------------------------------
polarization |         80   .0346475    .0665551          0   .2467106
 fractional~n |        80   .0762071    .1500471          0    .565968
 distanceptod |        80   58.10961    30.40556       .921     95.487
 distancedtop |        80   66.77763    44.04528          0        100
```

Table 8: Fractionalization and Polarization in the Districts under Study

District	Fractionalization	Polarization
Baabda	75%	18%
Saida	62%	21%
Akkar	48%	18%
Hasbayya	61%	21%
Tripoli	32%	13%
Minyeh-Denniyyeh	23%	10%
Nabatiyyeh	10%	5%
Marje'youn	32%	13%
Zahleh	61%	21%
Baalbek	72%	19%
West Beqaa	50%	18%
Hermel	64%	20%
Tyre	8.7%	4%
Bint Jbeil	26%	11%
Average	45%	15%

Source: Information International SAL, (2007).

Table 9: Regression Results for Receipts per Capita at the Level of Poverty Pockets

	Receipts per capita					
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
HH income/cap	0.002^{+}	0.002^{+}	0.002	0.003*	0.002	0.002
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)
Education	-31.41	-23.17	-24.12	-31.39	-63.18	128.71
	(59.20)	(58.57)	(64.70)	(58.68)	(69.09)	(126.91)
Unemployment	-475.68	-556.39	-375.82	-548.27	-367.33	-368.24
	(553.90)	(551.88)	(610.36)	(551.86)	(587.60)	(628.03)
Polarization	$7,039^{**}$			6,759.82**	$6,853^{**}$	$6,117^{**}$
	(1,690)			(1,688.96)	(1,773)	(1,901)
Fract		$3,210^{**}$				
		(741)				
Dist P to D			20.37	5.92		
			$(9.04)^{*}$	(4.19)		
Dist D to P			-9.14			
			(5.72)			
HH size					-108.25	-24.59
					(108.15)	(127.60)
Age					-9.34	-25.58
					(26.63)	(32.19)
NSSF					213.51	356.80
					(539.79)	(665.11)
Drink water						-376.24
						(409.79)
Sanitation						971.58
						$(474.21)^{*}$
Car						-116.15
						(651.32)
Size resid						3.88
						(6.94)
Electr						287.85
						(1,834)
Illiterate				-462.09		$3,524^{+}$
				(444.12)		(2,022)
Constant	-96.65	-92.03	-484.07		962.94	-1,383.74
	(363)	(360)	(489)		(1,274)	(2,450)
polarization2						
Observations	80	80	80	80	80	77
R-squared	0.35	0.36	0.23	0.37	0.36	0.45

Source: authors' estimates. Standard errors are in parentheses.
+ is significant at the 10% level, * is significant at the 5% level, ** is significant at the 1% level. All regressions control for district (not shown).

Table 10: Checking the Significance of Other Sectarian Composition Variables (1)

	Receipts per capita				
	(1)	**(2)**	**(3)**	**(4)**	**(5)**
polarization	7,025**	5,803**	7,055**	7,230**	7,011**
	(1,702)	(1,605)	(1,646)	(1,700)	(1,709)
maronite	238.7				
	(526.1)				
oc		3,769			
		(1,109)**			
sunni			-578.4		
			(275.5)*		
shiite				272.6	
				(266.5)	
druze					213.4
					(1,015.7)
Observations	80	80	80	80	80
R-squared	0.35	0.45	0.39	0.36	0.35

Source: authors' estimates. Standard errors are in parentheses.
+ is significant at the 10% level, * is significant at the 5% level, ** is significant at the 1% level. All regressions control for district, household income per head, education and unemployment (not shown).

Table 11: Checking the Significance of Other Sectarian Composition Variables (2)

	Receipts per capita					Log(rec/cap)
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
Alt polar	8,581**					
	(2,260)					
Fract		6,702				
		(5,393)				
Polarization		-7,973	1,638+	3,659	12,721**	5.57+
		(12,195)	(961)	(3,866)	(2,451)	(3.09)
District polar				1,157		
				(761)		
Dist P to D				3.469		
				(3.226)		
Dist D to P				0.291		
				(2.337)		
Observations	80	80	80	80	80	40
R-squared	0.32	0.36	0.32	0.18		0.43

Source: authors' estimates. Standard errors are in parentheses.
+ is significant at the 10% level, * is significant at the 5% level, ** is significant at the 1% level. All but regression (4) control for district (not shown). All regressions control for household income per head, education and unemployment (not shown).