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1 • Introduction

The relationship between individual heterogeneity and economic development is a complex and arcane one. In what follows I will focus on one particular aspect of this relationship, namely the impact of heterogeneity on economic solidarity, intended in the special sense of willingness to share a common good and to contribute resources for its provision. I will start by reviewing some of the extensive work on individual incentives to contribute to local public good provision within existing communities, i.e. when the composition of the beneficiaries is exogenously given, and will then move to recent contributions in which the set of people joining a group or community is endogenously determined. Most of the existing economic literature on the subject considers economic heterogeneity, e.g. income inequality, but this can be a useful departing point for understanding other forms of social diversity, to the extent that the latter are associated with different costs and benefits from collective action in a similar way as are income or wealth differences. The results on economic heterogeneity will not always extend to other forms of heterogeneity (e.g., ethnic), as the two are often but not always correlated. Obviously, any such association will be at the expense of more subtle analyses of the cultural and psychological dimensions of heterogeneity, but those go beyond the scope of the current analysis.

2 • Theoretical framework

2.1 Heterogeneity and public good provision

The traditional literature on public goods has looked at the impact of economic heterogeneity on aggregate contributions,

Solidarity in heterogeneous communities

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hence on efficiency in public good provision. The so called “neutrality theorem” by Bergstrom *et al.* (1986) shows that under the assumption that everyone consumes the public good in the same amount and that individual contributions are perfect substitutes in its production (i.e., in the case of a “pure” public good), and provided that the set of people contributing to the good does not change, small redistributions of income should not affect the aggregate provision of public goods. The reason for this “neutrality” of redistributive policies is that individuals should change their contributions accordingly so that aggregate provision is unchanged.

A well-known argument by Olson (1965) poses that in the more general case of “collective” goods, when the extent to which individuals benefit from the good depends on their initial endowments, the effect of increased inequality on collective action may indeed be positive. For given group size, when the share of the benefits is positively related to individual wealth, richer members have more incentives to contribute resources and/or to monitor others. Higher inequality would in this case alleviate the free rider problem and lead to increased public good provision.

Recently, Baland and Platteau (1997) have shown that the assumption that the group providing the collective good remains stable through time is crucial for the above result to hold. If members are allowed to quit, increased inequality may worsen the free rider problem for the poor and lead to *less* collective action because the set of contributors may shrink substantially.

Dayton-Johnson and Bardhan (2002) propose a noncooperative model of conservation of common pool resources in which next period’s payoffs depend on current exploitation of the resource by heterogeneous players. They show that the relationship between asset inequality and economic efficiency is U-shaped. At very low levels of inequality, no one has an incentive to over-exploit the common resource, conditional on other people not over-exploiting it, because everyone’s share in next period profits is high enough. As inequality increases, more and more poor people will find it convenient to over-exploit the resource because their claims on future profits would be too small. As inequality increases further, the shares of rich players become so high that they will conserve regardless of poor players’ behavior, with the extreme result of full efficiency when one player owns the whole resource and free riding is eliminated.

In a recent contribution Bardhan, Ghatak and Karaivanov (2002) examine a context in which there are market imperfections in inputs that are complementary to the collective goods: production involves a private and a public good and the marginal gain from

contributing to the public good increases with individual endowment of the private good (e.g., with wealth). In this case only people whose wealth exceeds a given threshold will contribute to the provision of the public good, so when assessing the impact of heterogeneity it is important to distinguish between redistributions that occur *within* the group of contributors and those that occur between contributors and non-contributors. Redistributing wealth from some poor who do not contribute to richer players who do should increase aggregate provision of the public good, in line with Olson’s argument. However, if individual contributions are a concave function of wealth, then joint surplus is maximized by *equalizing* wealth within the group of contributors.

While the above models provide a rather in depth analysis of the ambiguous relationship between collective action and economic inequality, it is not clear to what extent the same conclusions can be generalized to other types of heterogeneity. The most straightforward extension would be to view each income or wealth category as a separate “type” and ask whether changes in “type heterogeneity” can be viewed as changes in income or wealth inequality. Unfortunately the translation is not straightforward. Think for example of a society in which there is one very rich player and $N-1$ equally poor ones. This situation is associated with a high degree of inequality, and according to Olson would lead to a relatively high provision of the public good. However, the above society would not be considered as very heterogeneous in terms of types: out of N people, $N-1$ are exactly equal and there is only 1 member of the minority group. Suppose that heterogeneity is measured by the fragmentation index

$$F = 1 - \sum_i s_i^2 \quad (1)$$

where s_i is the share of type i in the total population. Then the above setting would be associated with a very low, not a very high, degree of heterogeneity. On the other hand, to the extent that types (e.g., racial groups) matter for public good provision only through their contributing capacity, then the inequality framework remains generally applicable.

A theory for linking directly “heterogeneity in types” to public good provision has been proposed by Alesina, Baqir and Easterly (1999). The authors propose a model in which the population is divided into several types that have to share the same public good but have different preferences over the kind of good to be provided. The good is financed through a lump sum tax that is the same for everybody, and decisions on the kind and the amount of public good to be provided are taken by majority vote. In this setting the amount of

public good chosen in equilibrium is decreasing in the average distance from the type of good preferred by the median voter, which is an indicator of preference heterogeneity. Compared to previous models of public good provision, the main innovation is the role played by preferences, which makes this model widely applicable to a variety of contexts. Two aspects are left unexplained in the model of Alesina *et al.* (1999). One is why preferences over public goods differ for different types, e.g. for different ethnic or racial groups. The second is the fact that the size and composition of the community is taken as given, hence people cannot respond to increased heterogeneity simply by quitting the community or joining another one.¹ In what follows we turn to models that allow for this latter possibility.

2.2 Heterogeneity and community formation

How is heterogeneity related to individual decisions to form a community or a group? Roughly speaking, one can think of two reasons why an individual may join a group. First, he or she may derive utility from participating per se: I will refer to this as the *preference* approach. Second, the individual may derive utility from consuming a good which the group provides to its members, something that may go under the label of *consumption* approach.² In both approaches, it is likely that the individual decision to join the group is affected by the heterogeneity of the other potential members of the group, but for different reasons. According to the preference approach, heterogeneity should enter the individual utility function directly, and the impact of increased heterogeneity on an individual's decision to join depends on whether he or she likes or dislikes diversity. According to the consumption approach, on the other hand, heterogeneity will affect participation if and only if it affects the quantity or quality of the good provided by the group and/or the cost borne by the individual.

La Ferrara (2002a) presents a model in which heterogeneous individuals can choose to join a group which provides an excludable good to its members, and derives predictions on the equilibrium composition of the group and on its size under two alternative access rules. The first is one of "open access", by which anyone can join provided he or she pays the cost. The second rule instead allows the members of the group to exclude someone by majority vote. She shows that an increase in income inequality has an ambiguous effect both on group composition and on aggregate levels of participation, and that the type of access rule is key in determining what income categories are represented in the group. In particular, open access groups will be formed by relatively poor individuals, while the composition of restricted access groups will be unbalanced in favor of the relatively

1. This aspect is common also to the collective action models reviewed above.

2. This approach is closest to the models of public good provisions described above. However, in the models of group formation outlined below it will be assumed that non-members are excluded from the consumption of the (impure) public good.

rich. The impact of increased inequality on participation is ambiguous and depends on the access rule and on the shape of the income distribution. In particular, aggregate membership decreases under open access when heterogeneity increases in the lower part of the distribution, while participation can actually *increase* under restricted access if the upper part of the distribution is sufficiently skewed.³

Turning to the “preference” approach, Alesina and La Ferrara (2000) consider a setting in which individuals prefer to interact with others who are similar to themselves in terms of income, race or ethnicity.⁴ Even in this setting, it is not obvious that total participation in a mixed group decreases if fragmentation increases. Consider the effect of a decrease in the share of majority type in the population, and an increase in the share of the minority type, i.e., an increase in the fragmentation index (1). The effect on total participation depends on whether the loss of majority type participants is more than compensated by the increase in minority participation. The implications of an increase in heterogeneity are also complicated by the possibility of sorting into homogeneous groups. If sorting has some costs, for instance transportation costs, then even when multiple groups are possible more fragmentation may lead to less participation.

Alesina and Spolaore (1997), study the effect of heterogeneity on the number and size of communities (countries). They explain the formation of a country as a compromise between the advantages of having a larger “scale” and the costs associated with increased preference heterogeneity resulting from a larger population. Benefits of size include larger internal markets, economies of scale in the production of public goods, internalization of policy externalities, and regional insurance schemes. The costs of heterogeneity arise because in large and diverse countries individuals with different preferences have to share common policies, so the average distance between the policy preferred by each individual and that chosen by the median voter increases with heterogeneity.

I now turn to some empirical evidence on the relationship between heterogeneity and public good provision, first, and then between heterogeneity and community formation.

3 • Empirical evidence

3.1 Heterogeneity and public good provision

The U-shaped relationship between inequality and collective action suggested by the theories outlined in section 2.1 has been val-

³ The key difference between the “explicit” restricted access regime in La Ferrara (2002a) and the “implicit” restrictions generated by the numerous papers in the multi-community literature (e.g., Epple and Romer (1991)) is that while in those models the residents of a community have to stand the same tax rates (or levels of public goods) they set to keep out somebody, in the model of La Ferrara (2002a) there are no “negative externalities” for group members deriving from the process of exclusion. This can lead to more segregated groups or communities.

⁴ If preferences are correlated to these characteristics, then this assumption is equivalent to saying that people prefer to join groups composed of individuals whose preferences are similar to their own.

idated by several empirical studies. Using data on 48 Indian water irrigation communities, Bardhan (2000) finds that land inequality is generally associated with lower cooperation in water allocation and in the maintenance of the canals, but there is also evidence of a weak U-shaped relationship between these variables. Dayton-Johnson (2000) finds similar results for irrigation projects in Mexico. In particular, he finds that canal maintenance⁵ is worse the higher is social heterogeneity (proxied by the number of different farming communities represented in the same maintenance unit) and the more unequal is the distribution of land. He also finds that the choice of the distributive rule matters. Recent work by Khwaja (2000) sheds further light on this issue by using original data on 132 community-maintained infrastructure projects in Northern Pakistan, the complexity of which ranges from simple irrigation channels to sophisticated electricity units. He finds that both land inequality and inequality in realized project returns have a U-shaped relationship with project maintenance. Furthermore, “social heterogeneity” — measured as the fragmentation into different clans, political and religious groups — is negatively associated with project maintenance. The “message of hope” in Khwaja’s empirical results is that good task design seems able to (potentially) compensate for fragmentation in allowing heterogeneous communities to succeed in collective action.

A recent paper by Miguel and Gugerty (2002) suggests a specific mechanism through which heterogeneity may harm public good provision in poor countries, namely social sanctions. Their focus is on ethnic as opposed to economic heterogeneity. In areas with weak legal enforcement, most informal transactions rely on the availability of “self-enforcing” mechanisms related to repeated interaction and reputation, as well as on the imposition of social sanctions on deviant members on behalf of their communities. Miguel and Gugerty assume that such sanctions are more effective if imposed *within* ethnic groups than *between* groups. They find support for this hypothesis in their data, collected in rural western Kenya, where primary school committees exert less pressure and impose fewer sanctions on parents who do not pay school fees and generally do not contribute to school needs, compared to committees in more homogeneous areas. Their key finding is that local ethnic diversity is associated with lower school funding (especially at public fundraising events) and lower school facilities.⁶

La Ferrara (2002b) studies the role of heterogeneity in the context of production cooperatives using a unique dataset on “self-help” groups with income generating activities collected in the informal settlements of Nairobi in 1999. Although these groups do not provide a pure public good to the community, the high degree of

5. Canal maintenance is measured by three indicators: the state of repair of field intakes, the degree of definition of canal side-slopes, and the amount of water leakage around the canals.

6. To account for the potential endogeneity of household sorting among schools, they measure ethnic diversity through residential composition in the surrounding areas (which has remained fairly stable in Kenya since the nineteenth century).

interdependence among the members (often in the form of cost and profit sharing arrangements) makes them an interesting application for the purposes of the present analysis. Furthermore, for people who do not have access to the formal labor market and whose options in the informal market are relatively unattractive, the possibility of pooling resources and working in groups constitutes an important employment alternative, hence understanding the performance of such groups seems quite relevant for developing areas. The main feature of the data collected by La Ferrara (2002b) is that information is available on each and every member of the surveyed groups, which allows to construct exact measures of group composition in terms of income, education, age and ethnicity. The advantage of this methodology, compared one that infers within-group heterogeneity from the heterogeneity of the population at large, is that it accounts for the possibility that people sort into groups that are more or less heterogeneous than the whole population. By having a “census” of the entire group, the matching between group composition and individual or group outcomes can thus be estimated more precisely. One of the main findings of the analysis is that ethnicity matters for gaining access to group resources, especially in the form of cheap loans: members who share the same ethnicity as the chairperson are 20 to 25 percentage points more likely to borrow from the group or from other members. Furthermore, earnings inequality has a negative effect on the likelihood of borrowing, and this effect is particularly strong in groups that experienced financial losses, suggesting that when the available capital to lend is particularly scarce and members are not remunerated “uniformly” it may be difficult to reach consensus on who should get a loan.⁷ Ethnic heterogeneity also seems to influence the organization of production: members of more ethnically heterogeneous groups are less likely to specialize in different tasks and more likely to all do the same job. Also, ethnically fragmented groups more often adopt remuneration schemes in which every worker gets the same fixed amount, rather than being paid on the basis of the amount of work put in. Again, this may be due to the relative difficulty of reaching consensus in heterogeneous groups. Finally, as in Miguel and Gugerty (2002), the ability to sanction members who free ride on contributions to the group is also lower in more fragmented groups.

Overall the above studies point to a problem of heterogeneous communities in facilitating collective action and good performance in the provision of common goods, which seem more severe the poorer the context of study. This constitutes an important obstacle to the process of economic development. But the evidence of a negative relationship between heterogeneity and collective action is not limited to developing countries.

7. This interpretation is reinforced by the fact that when loans from the group as a whole and loans from individual members are examined separately, earnings inequality has a negative impact on the former but not on the latter.

Alesina, Baqir and Easterly (1999) test the significance of racial fragmentation as a determinant of expenditure on public goods in US cities, combining Census and local governments expenditure data. They find that more heterogeneous areas spend a smaller share of their budget on roads, public education, and welfare: all goods that may be seen as “different in quality” from the goods that a homogeneous constituency would have selected. For the specific case of education, Poterba (1996) finds that government per child spending on K-12 education decreases with the fraction of the population aged 65 and above, and that this effect is strengthened when the difference between the fraction of nonwhite population aged 5-17 and the fraction nonwhite aged 65+ is included among the controls. This suggests an interplay of demographic and racial composition effects, as if older citizens were less inclined to spend on public goods that benefit younger generations when these generations belong disproportionately to a different race.

The next question to be addressed is whether there is evidence that, on top of harming public good provision by existing communities, economic or social heterogeneity harms the formation of such communities in the first place, especially for groups or communities whose special function is that of providing shared benefits to their members, with a high degree of interaction among them.

3.2 Heterogeneity and community formation

Using survey data from rural Tanzania, La Ferrara (2002a) examines the relationship between community heterogeneity and individual incentives to join economic, social and political groups within the village. She finds that villages where the distribution of assets is more unequal have lower participation rates, even after accounting for the potential endogeneity of inequality.⁸ More interestingly, inequality acts differentially on rich and poor people: when inequality increases, it is the relatively richer who drop out of groups, possibly because they have less to gain. As predicted by the theory sketched in section 2.2, however, the impact of inequality on participation depends on the shape of the distribution of wealth and on the access rule to the group. By exploiting the different sensitivity of several inequality indexes to different quintiles of the income distribution, La Ferrara (2002a) shows that inequality *decreases* participation in open access groups when there are wide disparities at the bottom of the distribution, while it *increases* it in restricted access groups when the disparities are around the middle and top part of the distribution. Finally, this study also suggests that group functioning in more unequal communities displays the following features: decisions

⁸ Local rainfall data is used to instrument for inequality, given the sensitivity of agricultural production to mean precipitation rates and to rainfall variability.

are less often taken by vote; members tend to sort into homogeneous income and ethnic groups; they more often report poor group performance and misuse of funds; they interact less frequently, and in general they feel less encouraged to participate.

Using survey data for the US in the period 1974-1994, Alesina and La Ferrara (2000) estimate the determinants of individual propensity to join groups as a function of individual characteristics as well as community variables such as income inequality, racial fragmentation, and heterogeneity in ethnic origin in the metropolitan area where the respondent lives. All these three indexes of heterogeneity turn out to have a negative and significant effect on participation, and the reason can be traced back at least in part to the “preference approach” outlined in section 2.2. In fact, thanks to the availability of direct data on individual preferences regarding racial mixing (e.g., survey questions on whether one opposes mixed marriages, or would send his children to school with children of the opposite race, etc.), the authors can estimate the effect of racial fragmentation separately for the respondents who favor inter-racial interactions and for those who do not. Interestingly, the negative effect of fragmentation only holds for people relatively averse to racial mixing, as the theory would suggest.

While the above paper looks at the role of racial fragmentation in affecting participation in socio-economic groups such as parent-teacher associations, sports clubs, church groups, political groups, and others, the work of Alesina and Wacziarg (1998) addresses a related question at a more macro level, looking at the determinants of country size. They show that larger countries have a lower share of government consumption in GDP, and a lower share of education related expenditures. They interpret their findings in the light of the tradeoff between heterogeneity (which is generally increasing in country size) and economies of scale, as formalized in the model by Alesina and Spolaore (1997).

Finally, Alesina, Baqir and Hoxby (2000) study how several dimensions of heterogeneity affect the formation of jurisdictions in the US, focusing on school districts, school attendance areas, municipalities, and special districts. They do not find significant tradeoffs between religious or ethnic heterogeneity and economies of scale, while they do find significant evidence of such tradeoffs for income and —especially- racial heterogeneity.⁹

⁹. In the most recent version of the work, to take into account the potential endogeneity of racial heterogeneity with respect to jurisdiction formation, the authors exploit exogenous changes in racial composition generated by internal migrations during the two World Wars.

4 • Concluding remarks

In the face of theoretical models that predict an ambiguous impact of heterogeneity on public good provision and on the formation of groups that produce such public goods, the empirical studies surveyed above seem to consistently point in one direction: more unequal and more racially fragmented communities end up providing fewer public goods to their members (or goods of lower quality), and even the likelihood that mixed groups or communities do form seems negatively affected by heterogeneity. However, a number of important questions remain to be addressed.

The first is the degree to which heterogeneity can be considered as an *exogenous* attribute of a society, as opposed to a variable that becomes more or less salient depending on economic conditions. Socio-cultural identity is not inherited once and for all: it is transmitted through social interactions in which the nature of the participants and of the social norms that emerge in equilibrium is likely to respond to economic conditions. The often acclaimed notion of “ethnic identity” is itself often manipulated by political groups to include smaller or broader sets of people depending on what is convenient at a given moment. A better understanding of when and why heterogeneity becomes more or less salient is certainly among the very next research questions to be addressed. A first step in this direction seems to be the recent work by Caselli and Coleman (2002), who formalize ethnicity as a device that allows to enforce membership in well defined coalitions. In homogeneous countries, members of the losing coalition can easily defect and join the winning one without being “easily recognizable”; this is more difficult in heterogeneous countries, which makes them more prone to ethnic conflict. How the salience of ethnicity varies with the economic fundamentals, however, remains to be understood.

Related to this point is the question of how exactly heterogeneity should be measured. Alesina *et al.* (2002) provide several measures of fragmentation, in particular linguistic, religious, ethnic (which includes both linguistic and racial elements) and find that these measures do not all bear the same relationship to many variables of interest (e.g., quality of institutions). Recent work by Nopo, Saavedra and Torero (2002) takes an innovative approach by using survey data in which every respondent is assigned a score from 1 to 10 for each of the four main racial groups in Peru: White, Indigenous, Black, and Asian. This way heterogeneity can be measured through a multi-dimensional index of “racial intensity”. Again, neither race, nor language or religion can be thought to be the universally relevant dimension over which collective action problems emerge. A better

understanding of how to measure heterogeneity in a meaningful way depending on the issue under study is in order.

Turning to theoretical issues, almost all existing models have emphasized the *costs* of heterogeneity, but it is conceivable that heterogeneity may also bring about economic gains. In a recent study, Baland, Dagnelie and Ray (2002) suggest that there can be complementarities among heterogeneous agents and study public good provision under different specifications for the production function of the public good. Their focus is on how the distribution of shares in the benefits of the joint production is related to the efficiency of public good provision, so it is not directly applicable to more general contexts. However, they reach the interesting conclusion that, contrary to the Olsonian prediction (according to which efficiency is maximized when one individual receives the full share of the benefits), when there is high *complementarity* among the inputs of rich and poor members higher disparities in income may lead to less efficiency. Preliminary empirical evidence by Ottaviano and Peri (2003) on a sample of US cities in the period 1970-1990 suggests that labor productivity, as measured by wages, increases with cultural diversity.

Finally, heterogeneity may play a strategic role in group formation. In their analysis of risk sharing groups, Genicot and Ray (2003) require that, in order for a group to be stable, no individual or *coalition* of individuals within the group should have an incentive to split. It would be important to study how an increase in members' heterogeneity affects the possibility to form "deviant coalitions", hence the stability of groups themselves.

The issues still open are many and important, but the challenge is worth taking, also for the profound policy implications that research in this area could have: if heterogeneity is credibly found to be associated with improved or deteriorated economic outcomes, the scope for economic policies that directly target heterogeneity (e.g., affirmative action, redistribution, etc.) is significantly increased.

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