A Theory of Social Identity with an Application to Redistribution *

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Abstract:

This paper develops a framework for incorporating social identity into economic theory. We say that an individual identifies with a group if he cares about the status of that group and wants to resemble its members. Identification is endogenous. People are more likely to identify with a group the higher its status and the more similar they see themselves to other group members. In equilibrium, both identities and behavior are endogenously determined. The model generalizes existing models of social preferences and organizes a large set of results from experimental economics and social psychology (determinants of ingroup bias, cooperation and conformity).

The usefulness of the model in explaining large-scale phenomena is examined by applying it to the political economy of income redistribution, focusing on class and national identities. We show that it can help explain three major patterns observed in modern democracies. First, national identification is more common among the poor than among the rich. Second, national identification reduces support for redistribution. Third, across democracies there is a strong negative relationship between the prevalence of national identification and the level of redistribution. The last two patterns have not been systematically documented before and are reported here for the first time. The application further points to national prominence, threats to the nation and diversity within the lower class as factors that may reduce redistribution. It suggests the possibility that rising inequality may lead to less demand for redistribution.

Keywords: social identity, social preferences, altruism, conformity, cooperation, endogenous preferences, income redistribution, income inequality, nationalism, social class.

JEL classification: D01, D72, H23, Z13

1 Introduction

People often perceive themselves as members of social groups: "I am an American", "I am an economist", "I am white", etc. Economists have of course long recognized that such group memberships may affect behavior in ways that cannot easily be reduced to material self-interest.[1] But it is equally obvious that not all group memberships have the same effects, and that in many situations the groups people belong to have no significant impact on behavior. To help further our understanding of how group membership shapes economic outcomes, we turn in this paper to social identity research.

For the past three decades, social identity has been the focus of intense research throughout the social sciences and, especially since the seminal work of Akerlof and Kranton (2000), it has attracted increasing attention from economists.[2] By now, a rich set of robust empirical results has been produced, based on both experimental and field studies. This paper takes these results seriously. It first attempts to distill them into a concise statement of what it means to identify with a group, and what factors are important for determining which groups people are likely to identify with. The paper then proposes an economic concept of equilibrium where the profiles of actions and social identities are jointly determined.[3]

[1] Becker (1957) for example proposed that people may like members of their own group (race, sex, religion etc.) more than they like people from other groups, and a vast literature now exists on the relation between race or sex and such outcomes as education, earnings or health. Economists have also studied how ethnic groups and social classes may affect public policies, social conflict or growth (Examples include Alesina et al. 1999, Alesina and La Ferrara 2000, 2005, Easterly and Levine 1997 and Robinson 2001). Experimental economists, in turn, found that behavior in groups systematically deviates from standard economic predictions (e.g. Ledyard 1995, Charness et al. 2007).

[2] As Jenkins (1996) puts it, "'Identity' has become one of the unifying frameworks of intellectual debate in the 1990s. Everybody, it seems, has something to say about it: sociologists, anthropologists, political scientists, psychologists, geographers, historians, philosophers" (p.7). For surveys of the social psychology literature see Brown (2000), Ellemers Spears and Doosje (1999b, 2002) and Hogg and Abrams (2001). For a sociological perspective see Jenkins (1996). The political science literature on gender, class, national, ethnic and other social identities is immense. Classic references include Anderson (1991), Gellner (1983) and Horowitz (1985). Akerlof and Kranton (2000, 2002, 2005) integrate some of this research into economics and apply it to gain new insights into issues that long concerned economists. Charness et al. (2007) examine some implications for behavior in the lab and Bisin et al. (2006) study the transmission of ethnic identity and its relationship to neighborhood characteristics. Benabou and Tirole (2006) develop a model where agents invest in identity as a means of self-signaling. Barrett (2005) contains several closely related papers.

[3] The goal of this paper is not to provide an explanation of the results of the social identity literature, based on some other set of assumptions. Rather, we attempt to distill those observations into a manageable set of assumptions that can provide the starting point of an economic analysis. We refer the reader to the psychology and evolutionary biology literatures for interpretations of the observed behavior. Our model, however, does not rely on these interpretations, and is based on the empirical observations.

The paper is composed of two parts. The first part (sections 2 and 3) presents the general model and argues that it generalizes existing models in a way that organizes a large set of existing empirical evidence not captured by available models. The second part of the paper (sections 4 and 5) applies the model to a specific issue and examines whether it can help us understand it better. The issue we study here is the political economy of redistribution and its relation to national and class identification. We refer the reader to Penn (2006) for an application of the model to constitutional design.

The basic theoretical framework is straightforward. A society may have many social groups – "American", "Hispanic", "middle class" and so on – but in any given situation individuals "identify" with only some of these. Given their social identities, they choose courses of action, which determine the aggregate outcome. That outcome forms the social environment that in turn affects the pattern of social identities. A Social Identity Equilibrium (SIE) is then a steady state where: *(i)* each individual's behavior is consistent with his social identity; *(ii)* social identities are consistent with the social environment; and *(iii)* the social environment is determined by the behavior of all individuals.

Social identification is defined in terms of preferences: to identify with different groups means to have different preferences over outcomes. Preferences involve two novel components. The first is the status of the various groups that exist in the economy. Group status is the relative position of a group on valued dimensions of comparisons such as wealth, occupational status and educational achievement. Thus, if we assume that individuals value consumption, then a group characterized by high levels of consumption will have a higher status than a group characterized by low levels, other things equal. The second component is the perceived similarity between an individual and the other members of the group. This component is modeled using the notion of distance in conceptual space from cognitive psychology. Each agent is characterized by a vector of (possibly endogenous) attributes. The perceived distance from a given group is then simply a weighted Euclidean distance between the agent and the prototype of that group, with the weights reflecting the relative salience of the various dimensions. Given these two variables, an individual is said to identify with group j if (1) he cares about the relative status of group j and (2) he wants to resemble the members of group j.

Next, we provide a description of the process of identification with a specific group. Two factors are at work here. First, a cognitive factor: people are more likely to categorize themselves as members of a group the more "similar" they are to the other

members of that group. Second, an affective factor: people tend to identify more with high status groups than with low status groups. Note that the factors underlying the process of identification – status and distance – are the same two factors that affect individual behavior under identification. This observation helps to make the analysis of social identity tractable. Finally, to close the model we need a function that maps the profile of actions taken by individuals into a set of consequences – which in turn determine perceived distances and group status.

The model generalizes several existing models of social preferences. Most importantly, it augments the Akerlof and Kranton approach – which emphasizes the tendency of group members to follow the prescribed or prototypical behavior of their group – with a second feature of identification: the willingness to sacrifice material payoffs in order to enhance group status. This last feature also generalizes models of altruism, since in many situations enhancing a group's status is equivalent to enhancing the welfare of other group members. Note however that this altruism is not universal but rather parochial, i.e. directed at ingroup members only. Further, in certain situations, seeking to reduce distance from the group may manifest itself as inequality aversion. But again, this difference-aversion refers only to differences between oneself and other ingroup members. Finally, since the model specifies the factors that determine who is likely to identify with what group, it may help account for some of the observed heterogeneity in altruism, conformity and inequality aversion.

The proposed model thus provides a simple yet powerful way to incorporate social identity into economic theory. In Section 3 we demonstrate how straightforward applications of the model can account for a large set of observed phenomena that are not explained by standard economic models. First, the model captures discrimination based on group membership in allocation decisions that do not affect the decision-maker's monetary payoffs (i.e. in situations where standard economic models offer no sharp prediction). Second, the model captures the observed relation between group membership and the extent of conformity with views and behavior of others. Third, the model helps explain some well known observations on contributions to public goods. It also captures the effects of inter-group comparisons, group heterogeneity and inter-group competition on the extent of cooperation observed.

The second part of the paper employs the model to address a rather complex issue: the relationship between social identity and redistributive politics. The application focuses on two prominent identities: class and nation. It starts from the simple point

that if redistribution affects the status of the poorer class, then class identification makes income distribution a more important issue to voters than does national identification. Thus, two types of equilibria may emerge. In the first, the members of the lower class identify with their class, meaning that they think of themselves partly in terms of membership in that class. Since redistribution affects the status of their class, they vote for a relatively high level of redistribution. A high level of redistribution can in turn help strengthen that class identity by endowing it with a higher status. In the second type of equilibrium, members of the lower class tend to think of themselves more as members of the nation as a whole than as members of a low-status part of it. They are hence less concerned with income distribution and more concerned with issues having to do with the status of their nation. They thus vote for a lower level of redistribution than they would under class identity. Again, low levels of redistribution can in turn help make identification with the lower class less attractive.

Which of these equilibria holds? This depends first on perceived distances which in turn depend on the extent and salience of common national attributes compared to income-specific and class-specific attributes. For example, an increased sense of commonality with fellow nationals (due to a perceived common threat, say) or a reduced sense of similarity to other members of the lower class (due to increased heterogeneity, say) are both likely to increase national identification and reduce class identification among the relatively poor. They hence promote a lower level of redistribution. Second, the equilibrium attained depends on exogenous sources of national and class status: powerful nations, for example, are more likely to engender national identification than powerless ones. Further, since pre-tax income distribution affects the status of the lower class, the model points to the possibility that an increase in pre-tax inequality will cause the poor to shift from a class identity to a national identity, which could lead them to vote for *less* redistribution. Finally, the model points to the possibility of multiple equilibria given the same economic and institutional fundamentals, suggesting a potentially lasting effect of historical contingencies.[4]

[4]In this respect the application relates to the literature on multiple redistributive equilibria (e.g. Piketty 1995, Benabou 2000, Benabou and Tirole 2005, Alesina and Angeletos 2005), and more generally to the literature on the different welfare systems in the United States and Western Europe (see Alesina and Glaeser 2004 for a comprehensive discussion). The contribution of this application is that instead of relying on multiple beliefs or market imperfections, it highlights the effects of redistribution on the status of the lower class and hence on the likelihood that members of that class will identify with it and behave (vote) in terms of their class membership. Our model also relates to models in which voters care about issues other than their economic payoffs (Roemer 1998), but offers an explanation of the origin of these other concerns and of how their prevalence may interact with the political outcome.

Can this model help explain observed patterns of national identification and redistribution? In the final section of the paper we examine the main implications of the model, both at the micro level and at the national level, using data from the ISSP 1995 – National Identity surveys, the World Values Survey, and the Luxembourg Income Study. Overall, the model seems to do a good job at explaining the major patterns. First, we find that in practically all democracies, poorer individuals are more likely to be nationalistic, as the model suggests (since, being the majority, the poor are more similar to the national prototype and since their more immediate social group has a lower status than the status of the high class). Second, in most advanced democracies national identification reduces support for redistribution. This effect appears to be very large when compared to the effect of economic self-interest. Third, the model implies that regardless of whether differences in redistributive systems arise from exogenous factors or from multiple equilibria, we should observe a negative relationship between the prevalence of national identification and the extent of income redistribution. In a cross-country analysis we indeed find a very strong negative relationship between these two variables. Indeed, when looking at established western democracies, the R^2 is between 60% and 72%.

The paper proceeds as follows. Section 2 presents the general model and discusses some special cases. Section 3 discusses the main experimental results captured by the model. Section 4 applies the model to political economy and section 5 presents the empirical results. Section 6 concludes. Proofs are in the Appendix.

2 Social Identity Equilibrium: a General Model

This section presents the general model. We concentrate on defining and explaining the concepts, and take up their justification in the next sections. Throughout we use i to denote an agent and j to denote a social group. An "ingroup" of agent i is a social group to which i belongs. An "outgroup" is a social group to which i does not belong.

We start with a standard setting. There is a set of agents $\mathcal{N}$, a set of available *actions* A_i for each agent $i \in \mathcal{N}$, a set of *consequences* C and a function $f : A \to C$, where $A = \times_{i \in \mathcal{N}} A_i$ is the set of possible action profiles. A consequence may, in some applications, simply be the vector of actions chosen by the agents. In others, however, f may denote a more complex aggregation function, e.g. a political process. We shall often refer to a consequence $c \in C$ as the social environment. For each agent $i \in \mathcal{N}$,

let $\pi_i : C \to \mathbb{R}$ be the agent's *material payoff.*

Let G be a non-empty set of *social groups* (or categories) $G = \{j | j \subseteq \mathcal{N}$ is a social group$\}$. One can think of social groups as categories that individuals learn to recognize when growing up and living in a society, much as they learn other categories such as "vegetable" or "chair". We do not attempt here to model the cultural or sociological process by which these categories evolved. Rather, our focus is on the process of categorization and identification with given social groups.[5] We place no formal restrictions on the contents of these groups (e.g. that they partition $\mathcal{N}$). Nonetheless, G is not an arbitrary collection of subsets – its elements must be socially significant categories. For example, while the "nation" and the "working class" have been important social categories in modern industrial societies (in the sense that many studies document their relevance for political behavior), the set of bald people is not an important social category in a political economy context.

The identification process involves both a cognitive and an affective factor. We begin with the former.

Perceived distance. A key factor in categorization decisions in the cognitive psychology literature is the perceived difference between the stimulus that is to be categorized, and the attributes of the available categories. Following Turner et al. (1987) we propose to adopt this approach to the process of categorizing *oneself* into a group. While there are many ways to think about perceived difference, we shall adopt the notion of "distance in conceptual space" (e.g. Nosofsky 1986, 1992, Gärdenfors 2000, Gärdenfors and Williams 2001): the larger the distance between stimulus i and category j, the lower is the probability that the stimulus would be categorized as a member of j .

Specifically, let each agent be characterized by a vector of attributes or qualities $q_i = (q_i^1, q_i^2, ..., q_i^H)$, where $q_i^h \in q^h$ and q^h is a closed subset of $\mathbb{R}$ for all $i \in \mathcal{N}$, $h = 1, 2, ..., H$. We call $Q = q^1 \times ... \times q^H$ the *conceptual space.* A social group is characterized by the "typical" attributes of its members, which we assume to be the mean across group members, i.e. $q_j = E_{i \in j}[q_i]$.[6] We refer to q_j as the *prototype* of group

[5] This follows research in cognitive psychology that studies perceptual categorization by focusing on how stimuli are being allocated to given categories, without explaining how categories are initially formed. See e.g. Lamberts (1997) and Logan (2004) for surveys. Fryer and Jackson (2003) propose a model that explains the emergence of social categories based on minimizing the sum of within-category variances.

[6] This corresponds to the prototype theory of categorization in cognitive psychology. This theory assumes that a prototype of each category – operationalized as the mean – is stored in memory and the categorization process involves comparing the various dimensions of these prototypes to the

j. A common special case is to code agents' attributes as binary variables, in which case q_j^h is simply the proportion of agents in group j with attribute h.

When several dimensions are involved in the categorization process, we need some assumption on how attention is divided between the different dimensions. Following Nosofsky (1986), we model selective attention by differential weighing of the dimensions in the conceptual space. Specifically, we will assume that the perceived distance between individual $i \in \mathcal{N}$ and social group $j \in G$ can be represented by a weighted Euclidean distance function:

$$d_{ij} = \left(\sum_{h=1}^{H} w_h (q_i^h - q_j^h)^2 \right)^{1/2} \tag{1}$$

where $0 \leq w_h \leq 1$ and $\sum w_h = 1$.[7] The attention weights w_h capture the relative salience assigned to different dimensions. As in cognitive categorization, the relative salience of the dimensions may depend on the context in which judgements are made.[8]

This specification allows the social environment in which agents operate to affect perceived distances in two distinct ways. First, as in Akerlof (1997), distances may change as the attributes of the agents (namely the values of q_i and q_j) change. In a consumption setting these can involve the entries in agent i's consumption bundle and in the prototypical consumption bundle of group j. Second, perceived distances can change as the attention paid to the various dimensions change, e.g. as the salience of clothing increases relative to that of leisure activity. Although in the main application of this paper we will take both these determinants of perceived distance as exogenous, in general d_{ij} may depend on agents' actions. We can thus write d_{ij} as a function $d_{ij} : C \to \mathbb{R}_+$.[9]

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stimulus. A competing approach is exemplar theory, which assumes that categories are stored as sets of exemplars. Categorization then involves comparing the new stimulus to all the stored exemplars. We adopt prototype theory mainly for analytical convenience.

[7] More generally, the distance function can be defined as a weighted Minkowski metric: $d_{ij} = (\sum_{h=1}^{H} w_h |q_i^h - q_j^h|^r)^{1/r}$, where $r \geq 1$ determines the distance metric. $r = 1$ yields the city-block metric, and $r = 2$ yields the Euclidean. The value of r that best fits categorization and identification data seems to depend on the type of dimensions that compose the stimuli. The traditional view is that the Eucledean metric is appropriate for "integral dimension" stimuli whereas the city-block metric for "separable dimension" stimuli. (A set of separable dimensions has the property that perceived differences between stimuli on one dimension are independent of perceived differences on other dimensions in the set). In the absence of clear guidance on how the dimensions that compose the perception of self and of social groups are related, we shall adopt the familiar Eucledean metric.

[8] To borrow an example from Gärdenfors (2000), when eating an apple, its *taste* is more salient than when using it as a ball to play with a child, in which case its *shape* would be particularly prominent.

[9] Note that unlike Benabou and Tirole (2006), we do not assume that agents face uncertainty

Group status. Social identification involves more than just a cognitive process of self-categorization. It also includes an important affective factor that relates to the "value" of the group. Studies in social psychology argue that very often, the evaluation of groups cannot be based on some absolute standard. Rather, it is determined through social comparisons to other groups along valued dimensions of comparisons (Tajfel and Turner 1986). In our setting one such dimension is material payoff. Thus, we can think of the status of a social group like economists commonly think of individual status (e.g. Boskin and Sheshinski 1978, Clark and Oswald 1998, Frank 1985). Let $\widetilde{\pi}_j(c)$ be some measure of group j's material payoff when the social environment is c.[10] Let $r(j)$ be the reference-group of group j.[11] The status of a group $j \in G$ is then given by some function:

$$S_j(c) = \widetilde{S}_j(\widetilde{\pi}_j(c), \widetilde{\pi}_{r(j)}(c)) \tag{2}$$

where $\partial \widetilde{S}_j / \partial \widetilde{\pi}_j > 0$ and $\partial \widetilde{S}_j / \partial \widetilde{\pi}_{r(j)} < 0$. Note that we allow different status functions for different groups in order to capture the effect of any other pertinent dimensions of comparison. It is implicitly assumed that all agents perceive the same status of any given group.[12]

We are now able to formulate a definition of social identity and a solution concept of the model.

Definition 1 *Agent $i \in \mathcal{N}$ is said to identify with social group $j \in G$ if his preferences over consequences can be ordered by a utility function $U_i : C \to \mathbb{R}$ of the form:*

$$U_i(c) = u(\pi_i(c), S_j(c), d_{ij}(c))$$

such that u is increasing in $S_j(c)$ and decreasing in $d_{ij}(c)$.

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regarding their own (or their group's) attributes.

[10] Formally, all we need from $\widetilde{\pi}_j$ is that for any two social environments c and c', if $\pi_i(c) \geq \pi_i(c')$ $\forall i \in j$ then $\widetilde{\pi}_j(c) \geq \widetilde{\pi}_j(c')$, with strict inequality if there exists $i \in j$ such that $\pi_i(c) > \pi_i(c')$. A simple example is mean material payoff within the group.

[11] In a two-groups setting, the natural reference group is simply the other group (the "outgroup"). In the case of more than two groups, non-trivial assumptions may have to be made as to who the reference group is. Indeed, results in the Social Psychology literature suggest that in such cases the reference group may be determined endogenously. See e.g. Mummendey et al. (2001).

[12] As a benchmark it seems safe to assume a general agreement in society about the relative standing of the various groups (Weiss and Fershtman 1998). The possibility of different agents perceiving a different relative status of the same group may be modeled by adding uncertainty about S_j. One may then also consider agents biasing their beliefs about the status of their group. See e.g. Jackson et al. (1996), Mummenday et al. (2001), Ouwerkerk and Ellemers (2002) and Schmader and Major (1999).

In words, identification with a group means caring about the status of that group while paying a cognitive cost that increases with the distance between the individual and the group. Loosely speaking, identification thus implies making the "group's interest" part of one's own interest. By (2) this means caring about the material payoffs of other ingroup members. Further, the cognitive cost of identification implies that as long as agents identify with a given group, they want to be similar to typical members of that group: from wearing the group's characteristic clothes and symbols, to imitating typical group behavior.[13]

It should be stressed that we use the concept of utility as it is used in standard economics, namely as an ordinal index that describes how the agent ranks outcomes.[14] Social identities are thus inferred from observed choices made by individuals, using revealed preference.

With social identification defined in terms of preferences, we now propose a solution concept that captures the endogenous determination of these preferences.

Definition 2 *A* Social Identity Equilibrium *(SIE) is a profile of actions* $a = (a_i)_{i \in \mathcal{N}} \in A$ *and a profile of social identities* $g = (g_i)_{i \in \mathcal{N}} \in G^{\mathcal{N}}$ *such that for all* $i \in \mathcal{N}$ *we have*

(i) $U_i(f(a_i, a_{-i})) \geq U_i(f(a_i', a_{-i})) \ \forall a_i' \in A_i$

(ii) $U_i(c) = u(\pi_i(c), S_{g_i}(c), d_{ig_i}(c))$ such that

$$u(\pi_i(c), S_{g_i}(c), d_{ig_i}(c)) \geq u(\pi_i(c), S_j(c), d_{ij}(c)) \ \forall j \in G$$

(iii) $c = f(a)$.

The first condition has to do with choice of actions under a given pattern of social identities. It is the standard Nash condition. The second condition describes the process determining the pattern of social identities. Formally, it requires that each agent's social identity be "optimal" given the social environment implied by $c \in C$. That is, an agent

[13] This should be distinguished from conformist behavior that results from material-payoff and informational considerations (Banerjee 1992, Bikhchandani et al., 1992). Identification requires that even when material payoffs are unaffected, agents seek to resemble people in their group, and, crucially, that in so doing they conform only to *ingroup* members' behavior – not to other people's behavior.

[14] While there exists some evidence to suggest that utility here may also be understood as expressing the individual's experienced well-being, Definition 1 refers only to preferences over outcomes. For evidence on well-being effects of identification (specifically that a person who identifies with a group *experiences* an increase in self-esteem when his group's status increases) see e.g. Hirt et al (1992). Note however that other studies report mixed results (e.g. Hunter 2001) and generally more complex relationships, having to do with the conditions under which self evaluations are based on intragroup or intergroup comparisons (Brewer & Weber, 1994, Major et al., 1993, McFarland & Buehler, 1995).

is more likely to identify with a group the higher is its social status and the smaller is the perceived distance between himself and that group. The third condition requires that the social environment be determined by the actions of the agents in the economy.[15]

Note that the definition of SIE does not impose any coordination requirement – in principle, one may identify with a group regardless of whether other members of that group identify with it. Indeed, by itself the social identity of agent i has no effect on other agents' payoffs – neither on their material payoff nor on the status of whatever group they identify with. It is only when social identity affects the choice of actions that such effects can come about.

We emphasize that the conditions in definition 2 are equilibrium requirements. We are not asserting that there exists some controlled, deliberative process in which individuals "choose" their social identities optimally. Rather, we are using the tools of optimization to describe a steady state that takes into account the observed process whereby (a) given cognitive distance, individuals tend to identify with the group that possesses the higher status, and (b) given status, identify with the group more similar to themselves. Thus for example, the definition does not preclude equilibria in which agent i could increase $U_i(\cdot)$ by simultaneously changing both action and identity. SIE only requires that actions be optimal given current identities and identities be optimal given current actions – not that agents choose actions taking into account all the alternative identities they can potentially have (although such a refinement might make sense in some contexts).[16]

Finally note, that the model does not directly assume heterogeneity in preferences over outcomes (beyond the usual heterogeneity in the material payoff function). Any such heterogeneity stems from agents' attributes (which are in principle observable), that affect the groups they identify with.

It is often convenient to make the following separability assumption, which we will maintain throughout this paper.[17]

[15] While we defined social identity equilibria as situations where each individual identifies with a single group, identification with several groups can be incorporated by allowing for mixed strategies. Identifying with *no* group can in principle be allowed by adding ϕ to the set of social groups G, and defining S_ϕ and $d_{i\phi}$ as constants, whose values determine the psychic cost of not identifying with *any* social group.

[16] On people's tendency to underestimate changes in their preferences see Loewenstein and Angner (2002) and Loewenstein et al. (2003). As Loewenstein and Angner put it, "it may be difficult to predict changes in preferences because our current preferences are an integral aspect of our personal *identity*... People define who they are in part by their tastes and values. Thus, having different tastes and values may seem like a betrayal of what one currently holds near and dear".

[17] We make this assumption mainly for tractability. Nonetheless, the assumption that the utility is

Assumption 1: *The utility function is of the form:*

$$u(\pi_i, S_j, d_{ij}) = \pi_i - \beta d_{ij}^2 + \gamma S_j, \quad \beta, \gamma > 0. \tag{A1}$$

Assumption 1 yields a nice interpretation of the SIE conditions:

Claim 1 *Assume $Q \subseteq \mathbb{R}^H$. Then under A1, any profile of social identities that satisfies the SIE requirement corresponds to a tessellation $V = \{V_j \subseteq Q\}_{j \in G}$ of the conceptual space,*[18] *such that if $g_i = j$ then $q_i \in V_j$. Further, if the set V_j is not empty, then it is a convex polygon. The prototype q_j may not be in V_j.*

Roughly, this result says that the profile of social identities in SIE corresponds to a partition of the conceptual space into convex sets, each containing the agents who identify with one specific group. The exact form of this partition is determined by the perceived distances between every agent and every group, as well as by the status of these groups in equilibrium. In particualr the status effect implies that even a group member with zero perceived distance from that group (i.e. a prototypical member) may in equilibrium identify with a different group.

2.1 Special cases

We end this section by noting that the proposed model can encompass and generalize several existing models.

First, in situations where one's actions cannot affect the status of whatever groups one identifies with, nor one's perceived distance from these groups, an agent in our model behaves like the standard material payoff maximizer.

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convex in distance is not unreasonable in the sense that the cognitive cost of identifying with a group should become prohibitively high when the individual is very different from the typical group member. It is plausible that a Hispanic student at an Ivy-League university would think of herself more as a student of that university than as a member of her ethnic group, due to the high status of the former. However, it seems very hard for an Afro-American high school dropout to identify with a university that admits few Afro-Americans. The perceived distance in this case would outweigh any status gains. See Ethier and Deaux (1994) for evidence.

[18] Let Q be a closed subset of $\mathbb{R}^H$, V_j a closed subset of Q and $\mathcal{V} = \{V_1, V_2, ...V_G\}$. Then we say that the set $\mathcal{V}$ *is a tessellation of* Q if the elements of $\mathcal{V}$ satisfy:

1. $[V_j \backslash \partial V_j] \cap [V_k \backslash \partial V_k] = \emptyset$, $j \neq k$, $j, k \in \{1, 2, ..G\}$
2. $\cup_{j=1}^{G} V_j = Q$

where ∂V_j is the boundary of V_j.

Second, the model proposed here generalizes the prominent feature of Akerlof and Kranton's (2000) model of social identity. Akerlof and Kranton focus primarily on the effects of social "roles" and "prescriptions" that indicate the appropriate behavior for people in given social categories. "Identification" in their terminology essentially means the adoption of such rules of behavior. This is also a feature of our model. Modes of behavior that affect perceived distances between self and group – i.e. behaviors that have non-zero salience – can induce agents to behave in accordance with their group's prototypical behavior. Similarly, our model can generate utility losses from certain non-prototypical behaviors by *other* group members, since such behaviors may increase perceived distance from the group.[19] However, in equilibrium social identity produces such conformist behavior (and punishment of deviants) only under conditions that sustain identification with the group in question, i.e. its status is sufficiently high and it is perceived as sufficiently similar to the agent. Note also that since in principle group prototypes in our model are themselves affected by agents' action, our model offers a way of studying not just the effects of social roles and prescriptions, but also their endogenous formation.

More generally, the social identity model can generalize (and possibly help identify econometrically) models that posit peer effects of the type that Manski (1993) terms "endogenous social effects". In a similar vein, it may help generalize models with difference aversion (Bolton and Ockenfels 2000, Fehr and Schmidt 1999).[20]

Third, the model generalizes models that assume altruistic preferences and allows at least a partial analysis of the circumstances in which people are more likely to hold such preferences (somewhat in the spirit of kin-selection theories). Specifically, since ingroup status depends positively on the payoffs of ingroup members, then in situations where actions affect members of the ingroup (but not members of its reference group) we may observe altruistic behavior. But again, in equilibrium such altruism is only expected under conditions that sustain identification with that group. Crucially, altruism is

[19] Note that our model has the further implication that not all deviations from group prototypical behavior would necessarily be disapproved. If agent i differs from a certain prototypical behavior of a group that i identifies with, i will not disapprove of deviations by other group members *in the direction of his own behavior.*

[20] That is, if income forms a sufficiently salient attribute in the conceptual space, then agents who identify with a certain group seek to minimize differences in income between themselves and other ingroup members. Note however, that this implies that inequality aversion is *not* expected vis-a-vis outgroup members (which yields a simple testable hypothesis). Further, willingness to incur costs in order to reduce income differences from ingroup members is more likely under conditions that encourage identification with the ingroup. This can generate heterogeneity in reduced-form preferences for equality, without assuming differences in the underlying preferences.

"parochial" (Bernhard et al. 2006), rather than universal: it does not apply to outgroup members.

Finally, when actions affect an outgroup that competes with the ingroup for status (i.e. the ingroup's status is strictly decreasing in that outgroup's material payoffs), we may observe behavior that while helping ingroup members, *hurts* outgroup members. Indeed, we may even observe costly actions that decrease the welfare of ingroup members if such actions sufficiently hurt the outgroup to produce an overall increase in the ingroup's status (Congleton and Fudulu 1996). A special case is what Glaeser (2005) defines as *hatred*, namely "the willingness of members of one group to pay to harm members of another group".

3 Experimental Results

In this section we seek to demonstrate that, while very simple, the proposed model can help organize a large set of experimental data, that are not fully captured by standard economic models, nor by alternative social preferences such as altruism and inequality aversion.

We organize the discussion around three well-established strands of research that specifically examine behavior in groups: the minimal group paradigm, social influence studies and public goods experiments. We do not discuss the standard two-person economic experiments (e.g. the dictator, ultimatum and prisoner's dilemma games) since social groups have mostly been absent from the designs of these experiments. Nevertheless, a growing number of studies using variants of these games explicitly incorporate groups into their design. The results, while still relatively scarce, are consistent with the social identity model proposed here. See in particular Bernhard et al. (2006), Charness et al. (2007), Chen and Li (2006) and Goette et al. (2006).

3.1 Minimal Group Experiments

Consider the following allocation task, denoted generically by MGP (for "Minimal Group Paradigm"). A set of agents $\mathcal{N}$ is partitioned into two equal groups. Each agent knows to which group he belongs. Each agent then chooses an allocation of profits (e.g. money) between two other randomly chosen agents, one from each group. The choices are made privately and simultaneously. There is no interaction between agents and they never know the decisions made by other agents, nor who is in their group or

in the other group. After all agents make their choices, payments are made in private and the experiment is over.

Allocations are chosen from linear choice sets. Agent $i \in \mathcal{N}$ chooses an action $a_i \in [a_l, a_h] \subset \mathbb{R}$ subject to the following budget constraint:

$$b_i = \alpha_1 a_i + \alpha_2 \tag{3}$$

where a_i is the amount that agent i allocates to an anonymous member of his group and b_i is the amount that he allocates to an anonymous member of the other group. Figure 1 illustrates two common cases. A negative α_1 means a trade-off between the ingroup member's profit and that of the outgroup member. In the special case where $\alpha_1 < -1$ (panel a), increasing the ingroup's profit reduces total profits. A positive α_1 means both profits move together. When $\alpha_1 > 1$ (panel b), increasing the ingroup's profit reduces the difference between the ingroup and the outgroup. Note that agent i's material payoff – the total amount allocated to him by other agents – is independent of his decision. Thus, the set of choices that maximize material payoff is the entire choice set.

Consider however the case of an agent i that identifies with group j. Note first that since agents never observe the actions nor the profits of other agents, it is reasonable to assume that the perceived distance between any agent and any group is not affected by the agent's allocation decision (i.e. differences in actions have zero salience). However, group j's material payoff ($\widetilde{\pi}_j$) is increasing with a_i, while the outgroup's material payoff ($\widetilde{\pi}_{r(j)}$) is increasing in b_i. In other words, actions in this setting affect group status but do not affect own material payoff nor perceived distance. Thus, identifying with group j requires choosing an action that maximizes S_j. This is illustrated by the dashed indifference curves in Figure 1. These indifference curves must have a positive slope,[21] which implies the following.

Claim 2 *In the MGP allocation task, an agent that identifies with the ingroup chooses the maximal allocation to the ingroup member when $\alpha_1 < 0$ (Figure 1a) but possibly a smaller allocation when $\alpha_1 > 0$ (Figure 1b).*

We will now examine whether exogenously varying perceived distance and group status affects the likelihood of behavior consistent with Claim 2.[22]

[21] Recall from equation (2) that $\partial \widetilde{S}_j / \partial \widetilde{\pi}_j > 0$ and $\partial \widetilde{S}_j / \partial \widetilde{\pi}_{r(j)} < 0$. The indifference curves in Figure 1 assume a quasi-concave status function, but this is not necessary for the result.

[22] Note that behavior consistent with claim 2 is only a necessary condition for identification. The

3.1.1 Varying perceived distance

Environments like the one we just described have been studied extensively in experiments initiated in the late 1960s (see especially Tajfel 1970, Tajfel et al. 1971) and replicated hundreds of times (see Brewer 1979 and Bourhis and Gagnon 2001 for reviews). Most commonly, the categorization into groups performed in these experiments consists of highlighting a common trait of the ingroup while contrasting it with the corresponding trait of an outgroup.[23] This amounts to exogenously affecting perceived distance from the groups by shifting more weight (in equation (1)) to the dimension on which all ingroup members are identical to each other and different from outgroup members. That the treatment indeed changes "perceived distance" is supported by the participants' reports: people who are categorized tend to indicate that they are more similar to their anonymous ingroup members than to the outgroup members.

The robust result in these experiments is that despite the very weak treatment, agents systematically favor their ingroup member. Thus, in the Tajfel et al. (1971) experiments, the proportion of respondents who chose allocations that favor members of their group ranged from 68% to 94%.[24] Further, there is evidence that in allocation decisions with $\alpha_1 > 1$, a majority of subjects choose distributions that maximize the *relative* gain in favor of the ingroup member over distributions that maximize both the absolute profit of the ingroup member, as well as the joint profit (Brewer 1979, Tajfel and Turner 1979). This behavior cannot be explained by universal altruism or inequality aversion.[25]

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benchmark experiment we just described does not yet allow us to infer identification based also on choices that affect distances.

[23] Often this is a trivial trait. Thus agents are categorized to groups based on some questionnaire or task that evaluate "aesthetic preference" or distinguishes "over-estimators" from "under-estimators" of number of dots on a screen. In these experiments group membership is in fact randomly assigned. In other experiments categorization is based on a real trait such as university affiliation.

[24] The result is also replicated using experimental economic methods (for $\alpha_1 = -1$) by Chen and Li (2006): on average, subjects allocated roughly two thirds of a fixed amount to their ingroup members and a third to outgroup members.

[25] If for example α_1 is positive, an altruist would always choose $a_i = a_h$, while if $\alpha_1 < -1$ an altruist would choose $a_i = a_l$. Both predictions are strongly refuted in the data. Similarly, inequality aversion cannot account for the ingroup bias seen in MGP experiments. Nonetheless, altruistic tendencies do seem to exert some influence in those tasks that relate to ingroup members only. In particular, MGP experiments also include control tasks in which participants are given identical choice sets as in equation (3), but where the allocation is between two members of the same group. Results: choices affecting two members of the ingroup are significantly nearer to the point of maximum joint profit than corresponding choices for two members of the outgroup. See Tajfel et al. (1971), pp. 168-169.

3.1.2 Varying group status

Consider now the effect of having another dimension along which groups are compared, besides material payoff, such that the two groups are not initially equal in status. A substantial body of research, both experimental and correlational, exists on the implications. These studies consistently find that people tend to identify more with high status groups than with low status groups.[26] As measures of identification, many experimental studies use the MGP allocation task described in equation (3). Other studies use subjects' reported feelings and attitudes toward the ingroup and the outgroup. Field studies usually have to rely on the second type of measure. A meta analysis of 92 experimental studies (including 145 independent samples) with high-status/low-status manipulation confirms that high status group members favor their ingroup over the outgroup significantly more than do low status group members (Bettencourt et al. 2001). Similar results emerge from field studies. For example, winning sports teams tend to attract more fans (Boen et al. 2002) and generate more identification (Cialdini et al. 1976). Double-major university students identify more with their higher-status department, and are more likely to identify with a given department the lower is the status of the other department they major in (Roccas 2003).

3.1.3 Trading Off Status and Distance

Consider again the MGP allocation task described in section 3.1, but now allow agents to observe the typical behavior of members of their group.[27] This effectively allows d_{ij} to respond to i's actions. Our model then implies that while categorization to a group may generate ingroup bias – this bias would be mitigated when ingroup members are known to typically make non-discriminating allocation decisions. This prediction captures the results reported by Jetten et al. (1996).

3.2 Conformity

By definition 1, an agent i that identifies with group j prefers an outcome where d_{ij} is low over one where it is high, other things (material payoffs, group status) equal. In other words, i seeks to be similar to other members of j. The model then implies that

[26] See e.g. Ellemers et al. (1988), Ellemers et al. (1992), Ellemers (1993), Ellemers et al. (1999a), Guimond et al. (2002), Hogg and Hains (1996), Mael and Ashforth (1992) and Roccas (2003).

[27] Typical behavior refers to past behavior by people who were also categorized as members of that group – but not behavior by anybody participating in the current experiment.

categorizing people to a group and highlighting their similarity to it should increase the likelihood of observing conformity with other members of that group. This captures a significant set of results from the literature on social influence. Thus, it has been shown that people are more likely to conform to views and behaviors of members of their group than to those of outgroup members.[28] Further, people conform more to ingroup norms of behavior when their group membership is made more salient either by highlighting group concerns, by making explicit comparisons between the ingroup and the outgroup or by making group identity more salient than individual identity.[29]

3.3 Public Goods

Minimal-Group allocation decisions are useful for inferring identification and studying its determinants, since they keep own material payoffs fixed. However, economically more interesting situations are arguably those where siding with one's group involves a material cost. One class of such situations that has been studied extensively is public goods (PG) experiments. Specifically, consider a one-shot voluntary contribution linear PG game (see Ledyard 1995). Agents are assigned to a group of size $n > 1$. Each agent i is endowed with income ω_i, part of which can be contributed to a public good where benefits accrue to all group members. Contribution decisions are made in private, but all agents know the total amount contributed by their ingroup members. Individual i's material payoff is given by:

$$\pi_i = (\omega_i - a_i) + \frac{\alpha}{n} \sum_{i \in j} a_i \ , \forall i \in j \tag{4}$$

[28] For example, Abrams et al. (1990) report that in an Asch line judgement procedure – where participants had to publicly announce which of a set of lines best matched a "standard line" in length, after having heard the announcements of three confederates – participants conformed to erroneous views expressed by confederates in 58% of the tasks when the confederates were ingroup members, but in only 8% of the tasks when the confederates were outgroup members. Mackie et al. (1990) and Mackie et al. (1992) report that subjects changed their privately held attitudes toward an advocated position coming from an anonymous ingroup member but were unaffected by the same message coming from an outgroup member. Spears et al. (2001) put it this way: "unless the nature of the message is so outlandish as to bring the whole question of group self-definition into question, we will tend to shift towards the group's position... the prototypical position" (p. 334).

[29] See Cialdini and Goldstein (2004), Mackie and Wright (2001) and Spears et al. (2001) for reviews. Akerlof and Kranton (2000) survey many studies that document conformity to group prototypical behavior. Benjamin et al. (2006) find that making ethnic or gender identity salient affects the degrees of patience and risk aversion exhibited by agents' choices, in a way that is consistent with typical behavior of these ethnic groups in the US economy.

where $a_i \in [0, \omega_i]$ is i's contribution, j is his assigned group and $1 < \alpha < n$. Thus, overall material payoffs are maximized if every agent contributes his entire endowment. Material payoff maximizers however have a dominant strategy to contribute zero to the public good, since the marginal per-capita return (MPCR) α/n is less than unity.

Consider now what happens if agents identify with the group they were assigned to (call these agents "identifiers"). For simplicity assume that group status is a linear function of mean group material payoffs:

$$S_j = \sigma_0^j + \sigma_1 \pi_j - \sigma_2 \pi_{r(j)} \tag{5}$$

where σ_1 and σ_2 are positive, and σ_0^j summarizes the effects on group j's status of dimensions other than material payoffs.[30] Further, since agents observe how much other members of their group contributed (on average), their actions might affect their eventual perceived distance from their group. Specifically, let the amount contributed and the material payoff received by each agent be two attributes in agents' conceptual space. Perceived distance is then:

$$d_{ij}^2 = w_a(a_i - a_j)^2 + w_\pi(\pi_i - \pi_j)^2 + \sum_{h=3}^{H} w_h(q_i^h - q_j^h)^2 \tag{6}$$

where w_a and w_π are the attention weights on the contribution and material payoff dimensions, respectively, and $q_3, .., q_H$ are assumed exogenous. In SIE, minimizing distance from the ingroup may thus have two potential effects. First, a pure conformity or peer effect: tending to behave as other ingroup members behave. Second, an inequality-aversion effect: preferring allocations where one's payoff is close to mean ingroup payoff (as in Bolton and Ockenfels, 2000).

Claim 3 *In any SIE of the voluntary contribution linear PG game:*

1. *An agent that identifies with his assigned group may contribute a positive amount. An identifier contributes more the higher is the marginal per-capita return (higher $\frac{\alpha}{n}$, for given group size n).*

2. *If either the contribution or the payoff dimension has non-zero salience ($w_a + w_\pi > 0$), then the identifier's best response is to contribute more the higher the average*

[30] Since we assume that an agent's action does not affect the material payoffs of agents outside his group, we do not need to specify what the reference group is. Some implications of relaxing this assumption are discussed below.

contribution of other group members.

3. *If the payoff dimension has non-zero salience ($w_\pi > 0$), then the identifier's best response is to contribute more the higher the difference between his own endowment and the mean endowment in his group (higher $\omega_i - \omega_j$).*

4. *An agent that does not identify with the group he is assigned contributes zero, assuming that actions taken in the PG game do not affect perceived distance from whatever group he identifies with and that this group has an empty intersection with the group he is assigned to.*

The first part of the Claim delivers what is probably the most robust result in PG experiments: contributions tend to increase with the MPCR (Ledyard 1995, Zelmer 2003, Holt and Laury 2005). This result is very intuitive here because as the MPCR increases, i loses less material payoff by contributing while the group gains more out of the contribution.

Part 2 of the Claim says that if actions affect perceived distance – either directly through comparing own action to others' actions, or indirectly through comparing material payoffs – then there exists strategic complementarity (on the part of identifiers). An agent that identifies with his group does not want to be too different from other group members, and hence responds positively to the average behavior of his group members. This is consistent with the observation that contributions to public goods increase with the contributions of other group members – even in a one-shot game (see Andreoni and Scholz 1998, Fischbacher et al. 2001, Frey and Meier 2004, Gächter 2005).[31]

Finally, if material payoffs are sufficiently salient, identifiers may also seek to reduce the difference between their own income and average group income. In particular, relatively rich agents contribute more (conditional on identification). Evidence here is rather scant, but suggests that this is indeed the case (see De-Cremer 2006 for a review).

[31] Two comments are in order here. First note that under a nonlinear status function, the status effect might depend on others' contribution and can imply *lower* contributions the more others contribute, as in the standard result on charity provision under altruism (see Sugden 1982). Empirically, if such an effect exists, it appears to be dominated by the conformity effect. Second, in a more dynamic setting, non-identifiers would take into account the conformist behavior of identifiers. If the proportion of identifiers and the MPCR are sufficiently large – they may find it optimal to contribute positive amounts in order to induce the identifiers to contribute more.

The results in Claim 3 are based on SIE condition (i): behavior is optimal given identities and others' behavior. Of course, the actual equilibrium level of contributions depends on the extent of identification with the specific group. As part 4 of the Claim suggets, agents who do not identify with their assigned group are likely to contribute zero. We thus expect contributions to increase with the factors that affect identification. In particular, we expect more cooperation in groups that receive a treatment which reduces perceived distance from the group. Consistent with this prediction, experimental results show that keeping material payoffs fixed, people tend to cooperate more with members of their ingroup when attributes that are common to all ingroup members are highlighted, compared to treatments that highlight attributes that only some group members share.[32] Indeed, it has been shown that making the membership in a randomly-assigned group sufficiently salient leads to higher contributions (Eckel and Grossman 2005) and that contributions increase when the group is physically closer, i.e. seated in the same room rather than in another room (Orbell et al. 1988). Studies also suggest that cooperation tends to decrease with ingroup heterogeneity, which is consistent with a reduction in identification stemming from increased average distance within the group.[33]

Finally, consider augmenting the payoff structure in equation (4) to include a negative effect of a contribution on the payoffs of outgroup members – i.e. keep $\partial\pi_i/\partial a_i$ and $\partial\pi_j/\partial a_i$ unchanged but let $\partial\pi_{r(j)}/\partial a_i < 0$ for $i \in j$. If i is only interested in his own material payoff, or even only in his group's material payoff (parochial altruism), this should make no difference. However, it can be easily shown that the optimal contribution of an identifier would increase (relative to the no-outgroup condition), since agents care about their group's *relative* position. Further, the introduction of such intergroup competition may also make group membership more salient, and hence enhance identification. On both counts, we expect contributions to increase. This prediction is also strongly confirmed experimentally.[34]

[32] Brewer and Kramer (1986), De Cremer and Van Vugt (1998, 1999), Kramer and Brewer (1984, 1986), Van Vugt and Hart (2004), Wit and Wilke (1992). See also Sausgruber (2003) and Solow and Kirkwood (2000).

[33] See Ledyard (1995) section D-1, Cherry et al. (2005), Polzer et al. (1999) and Zelmer (2003) for experimental results. For field studies, see Alesina et al. (1999) on the relationship between ethnic homogeneity and provision of public goods across U.S. localities, and Costa and Kahn (2003) on the relationship between company heterogeneity and cowardice in the Union Army.

[34] Bornstein and Ben Yossef (1994) is a particularly clean example. See Bornstein (2003) for a review of the literature. In Bornstein's words, "real intergroup conflict serves as a unit-forming factor that enhances group identification beyond classification and labeling alone... Group identification, in turn, increases cooperation, as it leads individual group members to substitute group regard for

To conclude this section, while other factors may be important for explaining social behavior, the notion of social identity we proposed captures concisely a remarkably large set of empirical results from social psychology and experimental economics. When led to perceive themselves as similar to their group, or when their group is endowed with high status, agents reveal a preference for a high relative position of their group in comparison to other groups, and appear to be willing to sacrifice personal material gain to promote that goal. They also show a stronger tendency to conform to views and behaviors of members of their group than to those of outgroup members.

4 Nation, Class and Redistribution

It is often said that people do not simply vote their economic interest – they vote their identity.[35] This section presents a simple application of our social identity model to redistributive politics in modern industrialized democracies. The application focuses on two of the most prominent social identities in modern history: nation and social class. Political scientists and sociologists have long maintained that in modern industrialized countries, social class has been a major source of identity that has at various times and places exerted significant influence over voting behavior. Similarly, there is little doubt that the nation has been – to varying degrees – an important social category in western democracies at least since the early 20th century.[36] This section examines how far a simple social identity framework can take us in explaining patterns of identification with these groups and relating them to redistributive policies. Needless to say, these are complex issues and the stark model presented here is not meant to cover all aspects of class identification, nationalism, or redistribution.

egoism as the principle guiding their choices... Consistent with this interpretation, we found that participants in the [intergroup] condition viewed themselves as motivated less by self-interest and more by the collective group interest than those in the [PG] control condition... The participants in the [intergroup] condition reported a higher motivation to maximize the relative ingroup advantage than those in the [PG] condition, and this competitive orientation was positively correlated with their contribution behavior" (p. 138-9).

[35] In a similar vein Blinder and Krueger (2004) report that expressed views on economic policies in the US are much more strongly related to "ideology" than to measures of self-interest. Fong (2001) surveys evidence that income is not a very good predictor of attitudes to redistribution and empirically examines a number of alternative (non-identity) explanations.

[36] The literature on these two idenitites is enormous. See e.g. Evans (2000) and Manza et al. (1995) for reviews of some of the literature on class voting. On the prominence of the nation as a social category see e.g. Anderson (1991), Billig (1995), and Gellner (1983). As we will note below, ethnic and racial identities deserve a separate treatment and will be left out of the current analysis.

Before turning to a detailed application, we highlight two straightforward – but important – implications of the general model that will be left out of the analysis. First, the social identity framework can easily generate deviations from self-interest due to conformity effects. If it is an established practice in a given group to oppose redistribution, and if political behavior in that group is sufficiently salient, then agents who identify with that group will modify their own political behavior accordingly. Thus many outcomes might be self-reinforcing. The application below abstracts from conformity effects and focuses on the status effects of redistributive policies. A second implication of the general model is that people may be more likely to support redistribution if the transfers are targeted to their own group (see Luttmer 2001 for evidence). The application below largely abstracts from heterogeneity within income-groups and focuses on general-interest redistribution.

4.1 Applying the model

Consider a simple general-interest redistribution setting involving linear-taxation and majority voting. There is a set of agents $\mathcal{N}$ and we focus on a subset $N \subset \mathcal{N}$ of agents who compose a single nation. A proportion $\lambda > 0.5$ of the agents in this nation have a relatively low pre-tax income of y_p, while $1 - \lambda$ have income y_r where $y_r > y_p$. We call these agents "poor" and "rich" for short, but one should keep in mind that the "poor" include most of the population – and in particular that they are the median income agents. We denote mean income by y. Agent i's material payoff π_i is just his post-tax income (or consumption), which is composed of income net of taxes and a government transfer k :

$$\pi_i(t) = (1 - t)y_i + k \tag{7}$$

where $t \in [0, 1]$ is the tax rate. As in the standard model of redistribution financed by distortionary taxation (Romer 1975) income taxation involves deadweight losses, which we assume to be quadratic (following Bolton and Roland 1997).[37] The government's budget constraint is then:

$$k = (t - t^2/2)y \tag{8}$$

[37]The assumption of a deadweight-loss function that is symmetric around zero is harmless in this setting since we only consider nonnegative tax rates. Allowing for negative taxes would require a more realistic specification. This would complicate the model without changing the equilibrium tax rate, and hence we keep the quadratic specification for simplicity. However, if one were primarily interested in the political preferences of the rich, other assumptions may be appropriate.

The tax rate is determined by agents' actions through a simple majority voting mechanism. Formally, an action by an agent is a vote for a tax rate, so that the action set is $A_i = [0,1]$ for all $i \in N$. A consequence is a chosen tax rate $t^* \in [0,1]$ which is determined by

$$t^* = f(a) = median\{a_i\}_{i \in N}.$$

Since policy preferences are going to be single-peaked throughout the application, this mechanism yields the same outcome as Downsian two-party electoral competition or a pure majority rule.[38] This keeps the political process as simple as possible, so that the equilibrium policy directly reflects the policy preferences of the voters – a reasonable approach to general-interest redistribution.

It can be easily verified that absent social-identity considerations, the chosen tax rate is $\widehat{t} = \frac{y - y_p}{y}$. This reflects the standard median voter result, whereby the equilibrium level of redistribution is higher the greater is the distance between median and mean income (Meltzer and Richard 1981).

We now add the necessary ingredients for a social identity analysis.

Social groups. As mentioned, we focus on a single nation. While there are other nations around, for the most part we will keep them in the background. In this nation there are three social groups. The first two – which we term classes – are the "Poor" and the "Rich". The third is the superordinate social category – the "Nation" – that includes all the agents in the economy that we study. The set of social groups is thus $G = \{P, R, N\}$ where $P = \{i \in N : y_i = y_p\}$ and $R = \{i \in N : y_i = y_r\}$. We will use lowercase p and r to denote typical low-income and high-income agents, respectively, and uppercase P and R to denote the related social groups.

The conceptual space. The first attribute of agents in this economy is their income. We thus let $q_i^1 = y_i$ for all $i \in N$ and denote by w_y the associated attention weight. Assume for now that there is no within-class heterogeneity. Thus there is a set of attributes $\{2, 3, ..., \widehat{h}\}$ shared by all the members of the nation (and only by them), and a set of class-specific attributes $\{\widehat{h}+1, ..., H\}$ shared by all the members of one class (and only by them). Assuming all these attributes can be written as binary variables, we have:

$$q_i^2 = q_i^3 = ... = q_i^{\widehat{h}} = \begin{cases} 1 & \text{if } i \in N \\ 0 & \text{otherwise} \end{cases} \quad \text{and} \quad q_i^{\widehat{h}+1} = ... = q_i^H = \begin{cases} 1 & \text{if } i \in P \\ 0 & \text{if } i \in R \end{cases}.$$

[38] Assuming, as we will, that agents do not play weakly dominated strategies.

Denote the sum of the attention weights on the national attributes by $w_N \equiv \sum_{h=2}^{\widehat{h}} w_h$, and similarly $w_C \equiv \sum_{h=\widehat{h}+1}^{H} w_h$ for the class-specific attributes.

Note that we treat perceived distances as exogenous. Thus we abstract from conformity effects, which as we mentioned can generate analytically trivial multiple equilibria. We also do not directly model the determination of policies (such as the nature of the school system) that affect agents' attributes or the relative salience of these attributes. In particular, we do not model the possible effects of the adopted tax policy on perceived social distances. This last assumption may not be very restrictive if classes are mostly characterized by attributes relating to pre-tax income and to socially-inherited qualities. A recent British survey suggests that this may be a reasonable approximation.[39] Respondents (N=1955) were asked which were "the best indicators of someone's social class – that is, most likely to tell you which class they belong to". The most common answers were "their occupation" (44%), "the area in which they live" (43%) and "their accent" (38%), followed by "their income" (34%), and "which school they went to" (27%).

Group status. Let $\widetilde{\pi}_j(t)$ be the measure of group j's material payoffs when the outcome of the voting is the tax rate t. As before, we assume for simplicity that group status is given by a linear function of the form

$$S_j(t) = \sigma_0^j + \sigma_1^j \widetilde{\pi}_j(t) - \sigma_2^j \widetilde{\pi}_{r(j)}(t), \quad j \in \{P, R, N\} \tag{9}$$

where σ_1^j and σ_2^j are both positive constants, and σ_0^j captures all exogenous factors affecting the status group j. For the two classes, a natural measure of material payoffs is the material payoffs of their members, i.e. $\widetilde{\pi}_R(t) = \pi_r(t)$ and $\widetilde{\pi}_P(t) = \pi_p(t)$, where lowercase r and p represent rich and poor agents, respectively. However, national material payoffs can be measured in many ways, depending on the relative importance given to the material welfare of the poor and of the rich. We thus write:

$$\widetilde{\pi}_N(t) = \alpha \pi_p(t) + (1-\alpha)\pi_r(t), \quad \alpha \in [0,1]. \tag{10}$$

Thus, if $\alpha = \lambda$ then national material payoff is measured by mean post-tax income. If α equals 1 we have a Rawlsian measure of national material payoff and if α equals zero it is measured by the post-tax income of the nation's richest individuals.

We assume that each class forms the reference group of the other class. The nation's

[39] YouGov Survey, August 2006, available at: www.yougov.com/archives/pdf/OMI060101132.pdf

reference group is some other nation (or nations). Finally, we note that while national status increases with $\widetilde{\pi}_N$ and decreases with $\widetilde{\pi}_{r(N)}$, it may be reasonable to suspect that these effects are small and that factors exogenous to the model (captured by σ_0^N) are the dominant determinants of national status.[40]

4.2 Social Identity Equilibria

We begin our analysis by looking at how the preferred tax rate is affected by the group one identifies with. Let $t_j^*(y_i) \in \arg\max_{t\in[0,1]} u(\pi_i(t), S_j(t), d_{ij})$ be the preferred tax rate of an agent with income y_i that identifies with group j.

Claim 4 *The tax rate preferred by a poor agent is lower if he identifies with the nation than if he identifies with his class.*

The intuition is given in Figure 2. The backward-bending curve represents a possible choice set in the $\pi_p - \pi_r$ plane. When the tax rate is zero (the top point on the curve), each agent gets his pre-tax income. As the tax rate increases, π_r decreases monotonically, while π_p initially increases but eventually decreases as the deadweight losses of taxation outweigh the gains from the transfers. When $t = 1$, material payoffs are equal for the rich and the poor. Note that π_p reaches its maximum when $t = \widehat{t} = \frac{y-y_p}{y}$. Class identification, however, induces individuals to care – in addition to their own material payoffs – about the relative status of that class. In particular, the indifference curve of a poor agent that identifies with the poor class now has a positive slope, yielding a higher preferred tax rate. National identification, on the other hand, shifts agents' social identity concerns to the status of their nation. As pointed out above, national status may have to do primarily with variables that are not clearly related to tax policies – in which case the preferred tax rate would still be $\widehat{t}$. However, to the extent that the material payoffs of the rich members of the nation also affect national status, the indifference curve of a poor nationalist has a negative slope. This yields a lower preferred tax rate. Notice that even in the extreme case where national status depends strongly on a Rawlsian measure of national welfare (hence vertical indifference curves), a national identity induces a lower ideal tax rate than does a class identity.

[40] Based on survey results from a large set of countries, Smith and Jarkko (1998) argue that general national pride is not closely tied to objective conditions but rather is related to "idio-national readings of history, assessments of the contemporary geo-political situation, and national aspirations".

It is noteworthy that for a rich agent, the effect of a national identity on the preferred policy depends on the sensitivity of national status to national material payoffs and, critically, on the extent to which national material payoffs depend on the material payoffs of the poor. If these relations are sufficiently strong ($\alpha\sigma_1^N$ is sufficiently high), then a national identity may imply a positive ideal tax rate (whereas a rich-class identity implies a zero ideal tax rate).[41] The possible pro-redistribution effect of national identity is consistent with a prominent view among political theorists, according to which national identification can help promote redistributive policies (e.g. Miller 1995, Tamir 1993). In a country where the rich set the tax rate but the nation's status is nonetheless significantly affected by the living conditions of the poor, a national identity may indeed be pro-redistributive. The evidence presented in the next section seems to suggest that, by and large, this is not the case in modern industrialized democracies.

Let us now turn to the determination of the equilibrium tax rate. Throughout the analysis we concentrate on the case where agents only identify with groups they belong to.[42] We first provide the intuition for the main result stated below. The preferences of the poor over tax rates are single-peaked under either a national or a class identity, hence it is weakly dominant for them to vote sincerely. Since the poor are the majority, the equilibrium tax rate is the tax rate most preferred by the poor. That is, the tax rate is $t_N^*(y_p)$ if the poor identify with their nation, and it is $t_P^*(y_p)$ if they identify with their class. Now, in SIE the poor identify with their nation rather than with their class if $\gamma S_N - \beta d_{pN}^2 > \gamma S_P - \beta d_{pP}^2$ (by SIE condition (ii) and Assumption 1). If the inequality is reversed they identify with their class, and in case of equality both social identities satisfy condition (ii). The equilibrium tax rate is thus a step function of $S_N - S_P$. This is depicted in Figure 3. For $S_N - S_P$ above the $\frac{\beta}{\gamma}(d_{pN}^2 - d_{pP}^2)$ threshold, the poor identify with their nation despite the fact that the nation is conceptually more distant from them than their class. They hence choose a relatively low tax rate. For $S_N - S_P$ below the threshold, they identify with their class and choose a relatively high tax rate.

[41] The rich agent's preferred tax rate is even higher if he identifies with the poor class. However, given our homogenous-class assumption, it can be easily verified that – under the weak assumption that the status of the rich class is not much lower than that of the poor class – a rich agent will never identify with the poor class in SIE. Nonetheless, one could consider a (nouveau) rich agent who shares most of the attributes of the *poor* class (accent, education, etc.). It might then be possible that in SIE he identifies with the poor class, as the smaller perceived distance from that class outweighs the status advantage of the rich class.

[42] In social-psychology terminology, class boundaries are "impermeable" (Tajfel and Turner, 1986). Formally, this means that the perceived distance of the poor from the rich class is sufficiently large, which holds if class specific attributes are sufficiently numerous and salient, that is if w_C is sufficiently large.

At the same time, $S_N - S_P$ is a function of the tax rate. A possible $S_N - S_P$ curve is depicted in Figure 3.[43] The crucial property of the $S_N - S_P$ curve is that it is lower at $t_P^*(y_p)$ than at $t_N^*(y_p)$. The intuition is simple: a higher level of redistribution diminishes the difference in material payoffs between the rich and the poor and hence increases the status of the poor, at least in the $[t_N^*(y_p), t_P^*(y_p)]$ interval. Further, to the extent that national status is affected by material payoffs, higher levels of redistribution reduce national status in this interval (mainly due to the efficiency costs of taxation).

In equilibrium, $S_N - S_P$ is determined by the chosen tax rate while as pointed out, the tax rate depends on $S_N - S_P$. As the figure suggests, depending on the parameters of the model a unique equilibrium or multiple ones may exist. If perceived distance from the nation is "high" relative to perceived distance from the poor class, and if national status at $t_P^*(y_p)$ is "low" relative to the status of the poor class at that tax level, then there exists an equilibrium where the poor identify with their class and the tax rate is high at $t_P^*(y_p)$. Conversely, if $d_{iN} - d_{iP}$ is sufficiently low relative to $S_N - S_P$ at $t_N^*(y_p)$, there exists an equilibrium where the poor identify with their nation and the amount of redistribution is relatively low. As the figure suggests, there are situations such that there exist two "stable" equilibria. At the low tax rate equilibrium, the status of the poor class is sufficiently low to induce the poor to identify with the nation rather than with the poor even though that entails a higher cognitive cost. They thus vote for a low tax rate. However, with a high tax rate the poor are not that far behind the rich in their standards of living and hence in their status. They may now identify with the poor class and thus vote for a higher tax rate.

Claim 5 *Assume that agents do not play weakly dominated strategies and that they only identify with groups they belong to. Then:*

1. *A Social Identity Equilibrium exists and can be of two types: one with relatively high levels of redistribution and class identification among the poor and the other with relatively low levels of redistribution and national identification among the poor.*

2. *A low-tax national-identity SIE exists if:*

   (a) *common national attributes are sufficiently salient compared to income-specific and class-specific attributes (w_N is high and w_C and w_y are low),*

[43] The curve does not have to be concave or even monotonic in the entire domain.

(b) *exogenous sources of national status are sufficiently high (σ_0^N is high, $\widetilde{\pi}_{r(N)}$ is low),*

(c) *exogenous sources of poor-class status are sufficiently low (σ_0^P is low).*

The reverse conditions ensure existence of a high-tax class-identity SIE.

3. *The qualitative effect of a change in pre-tax inequality on the equilibrium level of redistribution is ambiguous.*

4. *There are conditions such that both types of SIE exist.*

Part 2(a) of the Claim has to do with the effect of the distance that citizens perceive between themselves and their nation. The lower is d_{pN}, the higher is the likelihood of a low-redistribution equilibrium, other things equal. Perceived distance from the nation is largely due to slow-changing "fundamentals" such as the development of a common national language and culture versus local or class-specific cultures (see Weber 1976). However, as the experimental results mentioned in the previous section suggest, perceived distances can be significantly altered by changing the relative salience of common national attributes versus class -specific attributes. Thus, a common threat to all members of the nation, salient international competition or a conflict with another nation, are all likely to reduce d_{pN} and hence increase the likelihood of a low-redistribution equilibrium. In particular, a salient national security danger is likely to enhance a feeling that "we are all in the same boat" – rich and poor alike. But a national identity means less weight on class issues and less support for redistribution. This suggests that there may be an incentive for elites to hype national threats – perhaps even to the point of going to war – in order to diffuse domestic claims for more redistribution, or to soften opposition for a reduction in the level of redistribution (see the related discussion on the supply of hatred in Glaeser, 2005). On the other hand, threats or disasters that affect only the poor segments of society are likely to reduce national identification and increase demand for redistribution. In the longer run, factors like the nature of the school system – whether it fosters similarity to the nation or class distinctions – should have a crucial effect on the pattern of identification and hence on the redistributive regime.

Parts 2(b) and 2(c) of the Claim relate to the fact that group status may depend on dimensions other than the material payoffs of group members. A powerful nation for example is more likely to generate national identification among its members than

a powerless one, other things equal, and the same holds for a strong working class. Consider for instance Ronald Reagan's military build-up and rejection of Détente. If such policies enhanced America's stature, then according to our model they may also help explain the popularity and political success of the Reagan tax policies even among blue collar workers.[44]

Part 3 of Claim 5 relates to the effect of pre-tax inequality. The standard median voter result is that higher pre-tax inequality leads to more redistribution. This is not necessarily the case once social identification is allowed. The intuition is simple. While preferred tax rates may increase with inequality for any *given* social identity, changes in inequality can lead to changes in the pattern of identification since the level of inequality affects both perceived distances and group status. Thus, a drop in pre-tax inequality both reduces perceived distance of the poor from the nation and improves the condition of the poor relative to the rich. Thus in Figure 3, both the $\frac{\beta}{\gamma}(d_{pN}^2 - d_{pP}^2)$ threshold and the $S_N - S_P$ curve may shift down. If the shift in $S_N - S_P$ is sufficiently large relative to the other changes, the economy may move from a low-tax national-identity equilibrium to a high-tax class-identity equilibrium. Therefore, it is not clear that economies with higher pre-tax inequality will in general be at higher tax equilibria.[45]

The model thus suggests that we may observe rather different levels of redistribution among economies with similar pre-tax income distributions and similar political institutions, and it points to several important factors that can cause such differences. The last part of Claim 5 says that we may observe different levels of redistribution even when all these factors are held constant, as different levels of redistribution serve to reinforce the identification patterns that support them. Historical contingencies may thus have a lasting effect on the redistributive system. But in any case, empirically we expect to find higher levels of national identification the lower is the level of redistribution, and vice versa.

Two other issues are worth commenting on. The first is: who are the nationalists? In the simple two-class setting we are considering, the answer is rather stark: the poor.

Claim 6 *If the status of the poor-class is not much higher than that of the rich class,*

[44] Reagan himself said he hoped history would remember him "on the basis that... I wanted to see if the American people couldn't get back that pride, and that patriotism, that confidence, that they had in our system. And I think they have." (Reagan to Barbara Walters, quoted in *The New York Times*, June 6, 2004).

[45] This is consistent with most of the empirical studies reviewed in Benabou (1996) and Alesina and Glaeser (2004). See however Milanovic (2000).

then in any SIE in which the rich identify with the nation, so do the poor. However, there exist SIE where the poor identify with the nation but the rich do not.

Essentially, as long as there are no exogenous factors that endow the poor class with a significantly higher status then that of the rich (despite the lower material payoffs of the poor), the poor are more likely then the rich to identify with the nation. This identification pattern is due both to the low status of the poor class and to the fact that most of the members of the nation are poor, which means that poor agents are in general more similar to the nation then the rich are.

As we shall see in the next section, this simple result is consistent with data available from most modern industrialized democracies. Indeed, in these nations it seems reasonable to assume (as we did) that the status of the various social classes is positively correlated with the economic conditions of these classes (see Weiss and Fershtman, 1998). It is also reasonable to assume that in modern democracies common national attributes are sufficiently numerous and salient, so that perceived distance from the nation is not systematically larger among the poorer segments of society. But consider 18th and 19th century Europe, where productivity resides with the bourgeoisie but status still resides to a significant extent with the aristocracy. Further, at these early stages of industrialization much of the poor population lives in rural areas, often separated from the rest of their nation by cultural, linguistic and geographic barriers. Perceived distance from the nation is thus higher for the rural poor than for the urban middle class (Weber, 1976, part I). Similar conditions may also characterize some developing countries today and colonized countries in the past, where much of the poor population inhabits remote rural areas, and where the middle class does not enjoy as high a status as it would based on its domestic economic position. Under these conditions, the urban middle class may be more likely to hold a national identity than are the rural poor.[46]

[46] To see this, consider an economy with three income levels $y_p < y_m < y_r$ and accordingly three classes. Continue to assume no within-class heterogeneity. If status is largely determined by income, then the middle class has a higher status than the poor class. Thus, the status effect still works to make the poor more likely then other classes to hold a national identity in SIE. However, middle-income agents may well be closer to the national prototype than are either the poor or the rich. Hence the distance factor works to make the middle class "more nationalistic" than either the poor or the rich (the latter group, having a high class-status, may be the least likely to hold a national identity). Such a result is even more likely if the middle class is deprived of political power and other determinants of status. Nonetheless, as common national attributes become more prevalent and salient (e.g. due to a common national language rather than local dialects, a road system that promotes a perception similarity to distant fellow nationals, etc.) the distance effect diminishes in importance (in the limit, when $w_N = 1$ all distances are zero). Now, as class status becomes more closely correlated with income, we are back to the basic result in Claim 6, whereby the poorer segments are more likely to hold a

A final point concerns within-class heterogeneity. This issue deserves a separate study, primarily because the sources of heterogeneity may well be related to other bases of identification (e.g. ethnic groups). Analyzing the interaction between identification patterns and the redistributive regime in this case should thus model not only the heterogeneity in attributes but also the determinants of the groups' status. In this context one should consider policies targeted at the specific groups and not just redistribution from rich to poor. For all these reasons, an analysis of within-class heterogeneity is beyond the scope of the current paper (see Penn, 2006 for an application of the model to the issue of ethnic versus national identification). Nonetheless, the present framework allows us to make the following simple point, which relates less to the identification patterns of minorities and more to those of the "majority" population.[47]

Claim 7 *Suppose a proportion $\mu < 0.5$ of the poor agents possess some salient attribute x, that differentiates them from the rest of the population. Then, the equilibrium level of redistribution is weakly lower the higher is μ.*

The intuition is simple: since $\mu < 0.5$, the pivotal voters turn out to be the poor agents who do not possess attribute x. Now, as μ increases, these agents may dissociate themselves from their class – which becomes less similar to themselves – and identify with their nation. This implies a lower level of redistribution. Obviously, the effect of μ would be even stronger had we assumed that a higher proportion of x's in the poor class lowers the status of that class.

This simple point might help explain the shift of significant portions of the working class in Western Europe from socialist to nationalist parties (Kitschelt 1996, Ignazi 2003, Lubbers et al. 2002). A recent survey on the resurgence of the radical right in Western Europe states that "certainly the most common explanatory factor put forward for the electoral breakthrough of the radical right are immigration and the presence of immigrants" (Schain et al. 2002, p.11). Such a relationship is readily interpretable in terms of Claim 7. Immigration of foreign workers affects primarily the composition of the poorer segments of society. As a consequence, identifying oneself as part of the working class is not as self-evident for the native workers as it used to be. Thus,

national identity.

[47] For this result we also need the very weak assumption that σ_2^R is not much larger then σ_1^R. This ensures that a rich agent that identifies with the rich class does not support a tax rate of 1 just to harm the poor, sacrificing both his own and his class's material payoffs.

support for general-interest redistribution declines.[48] Note that this result does not rely on any adverse effects of immigration on the pre-tax economic conditions of the natives (pre-tax incomes are held constant in Claim 7).

5 Evidence: National Identity and Redistribution

This section seeks to uncover some of the empirical relationships between national identification and redistribution, and check whether they are consistent with the model. The analysis is correlational in nature and is not meant to establish causal links (in a separate paper we examine the interaction between social identity and voting behavior in a controlled lab experiment). We examine three implications of the model:

1. Support for redistribution decreases with national identification among the non-wealthy (Claim 4).

2. The poor are more likely than the rich to identify with their nation (Claim 6).

3. Across democracies, there is a negative correlation between levels of national identification and levels of redistribution (Claim 5).

We concentrate on the national-identity side of the model and not the class-identity side for two reasons. First, in contrast with data on national identification, data on class identification are hard to obtain. While many surveys (e.g. the GSS, Eurobarometer and World Values Survey) ask respondents what social class they *belong* to, this is at best a self-categorization question, similar to asking "to which nation do you belong?" It tells us little about identification as we defined it.[49] Second, the effect of class identification seems less contentious. It would not be too surprising to find that low income individuals with a strong "working class" identity desire more redistribution then their comrades with weak class identification. Similarly, it would not be very novel to find that class identification and class voting is more common in Western Europe, where there are higher levels of redistribution, than in the USA (see Evans, 2000). The implications regarding national identification however appear more in need of empirical verification.

[48] Consistent with this interpretation, Soroka et al. (2006) find a negative relationship across OECD countries between changes in social spending and immigration flows in the 1970-1998 period.

[49] Indeed the class question usually does not even give us a good measure of self-categorization since most surveys do not allow the respondent the option of not belonging to *any* class.

We use both micro and cross-country data. The micro data come from the World Values Survey (WVS, waves 1-3) and the International Social Survey Program (ISSP): National Identity, 1995. Each survey covers more than twenty democracies during the 1990's. Our primary measure of the extent of redistribution at the national level comes from the Luxemburg Income Study (LIS). We limit the analysis to democracies, but use a relatively lax definition of democracy (see Data Appendix). This allows some comparison of how the model fares in a wider range of countries.

5.1 Preferences for redistribution by income and national identification

Our definition of social identity requires that an agent care about the status of his group. In experimental studies, such preferences can be directly inferred from behavior. In larger empirical studies, we have to rely on survey questions. Ellemers et al. (1999a) show that ingroup favoritism in allocation decisions is captured by questions on "commitment to the group", meaning the desire to continue acting as a group member. These consist of agreement to such statements as "I would like to continue working with my group" or "I dislike being a member of my group". On the other hand, ingroup favoritism is *not* captured by mere self-categorization statements such as "I am like other members of my group." In a similar vein, we find – in a separate experimental study using natural groups in a political-economy game – that willingness to forego material payoffs for the group's benefit is best correlated with responses to the items "I am proud to be a member of my group" and "when someone criticizes my group it feels like a personal insult". It is not correlated with responses to "I am similar to other members of my group".

The WVS contains a question asking: "How proud are you to be [e.g. French]?" answered on a scale of 1 to 4 ("very proud", "quite proud", "not very proud" and "not at all proud"). This question seems reasonably well suited to capture our concept of national identity.[50] As mentioned above, no such question exists with respect to class identity.

The WVS also asks respondents to rank on a scale from 1 to 10 whether "incomes should be made more equal" or whether "we need larger income differences as incentives for individual effort". This question captures preferences over the type of policies that

[50] The ISSP provides better measures of national identity, and will be used extensively below, but it does not contain data on attitudes toward redistribution.

we have studied in the model, namely ones that make incomes more equal (as opposed, for example, to policies designed to secure a minimal standard of living for the poor).[51] These data can be used to examine the first implication.

The analysis is performed only on those surveys in which respondents were asked to indicate the exact bracket (in local currency) into which their household income fell, and where detailed data about those brackets is retrievable (see Data Appendix). Descriptive statistics are in the Appendix (Table A3). Median support for redistribution ranges from 3 to 7, with standard deviations of around 2.9. Household income data are comparable to data from LIS household surveys, but with lower means in most countries, suggesting that the rich are not well represented. The fraction of the survey population who are very proud to be members of their nation ranges from 19% in West Germany to 94% in Venezuela.

As a way of directly looking at the data, Figure 4 presents nonparametric estimates of the expected support for redistribution as a function of log household income. For each World Values survey, we break down the population into two groups by level of pride in one's nation. For each survey we then estimate a separate regression function for each of the two groups, using Fan (1992) locally weighted regressions. The first group (shown by the solid lines) includes those professing to be "very proud" to be members of their nation. The other group (dashed lines) includes the rest. It is convenient to divide the economies into more and less advanced, which we do using real GDP per capita.[52]

The first thing to note is that within each group, support for redistribution tends to decrease in income in most surveys, with occasional nonmonotonicities at the tails of the income distribution. The striking result however is the fact that in most advanced economies, people who identify more strongly with their nation prefer a lower level of redistribution than people with low levels of identification and similar income. This pattern seems to hold in Austria, Britain, Canada, Finland, Japan, the Netherlands, Sweden, Switzerland, USA and Germany (West and East). The only advanced economies where this relationship is not apparent are Belgium, Italy and Spain.[53] Out-

[51] In fact, the WVS contains a question on whether "the government should take more responsibility to ensure that everyone is provided for" or whether "people should take more responsibility to provide for themselves" – without reference to equality or relative position. The relationship between national identity and support for such policies is indeed less clear than the relationship between national identity and support for equalizing incomes.

[52] Economies are classified as "Less Advanced" in a given year if Real GDP per capita (Penn World Table 6.1) is less than 50% of USA Real GDP per capita.

[53] Note that Italy, Spain and Belgium also have strong ethnic-regional cleavages (I am grateful to

side the industrial world, however, there is usually no clear difference between the two groups in the support for redistribution, once we control for income (the exceptions being Turkey 1990 and Latvia 1996). Finally, although it is impossible to assert that these surveys contain representative samples of the rich, it is interesting that there appears to be little evidence that national identity systematically enhances support for redistribution among the rich.[54]

Another way to look at these data is presented in Table 1. The table reports OLS regressions of the support for redistribution on log income and dummies for level of national pride, controlling for sex, age, years of education and log household size.[55] We refrain from pooling the data together, since the variables are not equivalent across surveys. In particular, the attitude to redistribution is stated in reference to the local level of income inequality ("incomes should be made more equal"), which differs between the surveys. Hence, we report a separate regression for each survey. The results show once again a negative relationship between income and preferences for redistribution in almost all countries. Further, people who profess to be "very proud" of being members of their nation appear to support redistribution significantly less than people who profess to be "not proud" or "not at all proud", controlling for log of income and years of education. The point estimates are negative in 23 out of 27 available surveys – and appear very large when compared to the effect of income. If taken literally, the point estimates imply that moving from not being proud to being very proud of one's nation is equivalent in terms of attitudes towards redistribution, to having one's household income multiplied by a factor of between 1.5 and 3 in most western democracies. The estimated effect is exceptionally large in the two surveys from the United States, but is based on very few American respondents in the base category. Nonetheless, even

John Londregan for this point). This suggests that our model may need to be adjusted when a strong regional identity is available. If the predominant immediate social group is not the class but the region, then it is not clear that a shift to a national identity will in general mean less support for redistribution. Northern Italy or Catalonia for example are relatively rich regions and hence shifting from a national to a regional identity in these areas may actually reduce support for redistribution.

[54] Out of the sixteen surveys of advanced economies, Figure 4 suggests such a pattern in no more than seven surveys (Italy, Spain 90, Sweden, Switzerland, USA 90 and possibly Finland and West Germany).

[55] The results are very similar without controlling for these additional variables. We report OLS rather than ten-categories ordered probits mainly for ease of interpretation. The qualitative results are unaffected by the choice of estimation method. To make sure that the national pride dummies (which, as we shall see in the next section are strongly correlated with income) are not picking up some non-linear effect of income, we repeated the estimations with non-linear terms for income up to a third order polynomial. The estimated coefficients and standard errors for the "very proud" and "quite proud" dummies were hardly affected.

moving just one notch from "quite proud" to "very proud" is equivalent to multiplying household income by a factor of 6.5 and 1.9 in the 1990 and 1995 American surveys, respectively. Consistent with the non-parametric estimations, the relationship between national pride and preferences for redistribution is statistically significant in most industrialized countries, but weaker in the less advanced countries. Finally, the third column of Table 1 shows that, as expected, the effect of being "quite proud" is generally smaller than that of being "very proud"– although it retains a negative sign in almost all surveys.

5.2 National identification by income

The model suggests that low income individuals, having less to be proud of in their immediate social group compared to the rich, and being more similar to the representative agent in their nation, will in general tend to identify more strongly with the nation. We now check whether this claim is consistent with available data. We use detailed micro data from the ISSP 1995 National Identity module. The ISSP 1995 contains surveys from 22 democracies. The surveys include the following six items which seem to capture our notion of national identity (see the discussion in the previous section).

> How much do you agree or disagree with the following statements? [1. Agree strongly; 2. Agree; 3. Neither agree nor disagree; 4. Disagree 5. Disagree strongly. "R"≡Respondent]
>
> 1. I would rather be a citizen of (R's country) than of any other country in the world.
>
> 2. There are some things about (R's country) today that make me feel ashamed of (R's country).
>
> 3. The world would be a better place if people from other countries were more like the people in (R's country).
>
> 4. Generally (R's country) is a better country than most other countries.
>
> 5. When my country does well in international sports, it makes me proud to be citizen of (R's country).
>
> 6. (R's country) should follow its own interests, even if this leads to conflicts with other nations.

While all items gauge feelings of national pride, items 2 and 5 are conditional on transitory conditions ("things about my country *today*"), and may thus be less suitable

to capture national identification. Below we will summarize the data from all these items using a single national-identity scale. However, we first report the main qualitative results using each of these items separately. Descriptive statistics are in the Appendix (Table A4).

For each country and each of the six national pride items, we estimated an ordered probit model with the national identity variable as the dependent variable and with log of income, log of household size, sex and age as independent variables. We then repeated this procedure with controls for years of schooling. The results (not shown) were as follows. For items 3, 4 and 6, the estimated coefficient on log income is negative in all the surveys: the higher the income, the lower is the extent of national identification. This effect is statistically significant in between 17 to 19 of the 22 surveys. This pattern generally holds also when controlling for years of education. Further, since in most democracies the more educated groups also enjoy a higher status, the logic of our theoretical model would lead us to suspect that more highly educated individuals would identify less with their nation (though obviously there may also be other reasons for this relationship). This expectation is generally confirmed, although the relationship is less robust than that of income. For item 1 the estimated coefficient on income is generally negative but is statistically significant in only 13 of the 22 surveys. Finally, items 2 (shame) and 5 (sports) indeed show a weaker relationship to income. Item 5 gets the "right" sign in almost all countries, but the effect is statistically significant in only 7 of them. Item 2 has the correct sign in only about half the surveys, and is statistically significant in only 4 surveys (all the significant coefficients have the right sign, though: richer people feel more ashamed of their country).

We do not report all these coefficients (from more than 250 regressions). As a way of summarizing the data, we do the following. First, we construct a national identity scale from these six items. Answers to each item are scored from 0 to 4, with a higher score representing the more nationalist answer, and the items are then summed up with equal weights. The resulting scale ($\alpha = 0.61$) takes values in $\{0, 1, 2, \ldots, 24\}$. Second, we estimate by OLS a linear regression model using this scale as the dependant variable and log income as explanatory variable, controlling for log household size, sex and age. These regressions cannot be interpreted in the standard sense, since the constructed scale is not a cardinal variable. But since we are only interested in the sign of the relationship, these shortcuts are a useful way to summarize the data. The results are presented in Table 2. The data seem overwhelmingly supportive of the notion that poorer people tend to identify more strongly with their nation. A negative

relationship between income and the national identification scale is apparent in all countries surveyed. The relationship generally holds also when controlling for years of education. The results are even stronger when using a four-item scale that does not include items 2 and 5 to measure national identification (not shown).

5.3 The cross country patterns

Finally, we arrive at the overall levels of redistribution and national identification. According to the model, in equilibrium we should expect high levels of redistribution to be accompanied with relatively low levels of national identification and vice versa. Since both these variables are endogenous, we only look at correlations here.

To measure the extent of actual redistribution as defined by our model we need data on both pre-tax and post-tax income. The best available data that are reasonably comparable across countries are the data from the Luxemburg Income Study compiled by Milanovic (2000). For each country participating in the LIS, these data include the distribution of household per-capita *factor* income and the distribution of household per-capita *disposable* income. Factor income is defined as pre-transfer and pre-tax income, and includes wages, income from self-employment, income from ownership of physical and financial capital, and gifts. Disposable income is equal to factor income plus all government cash transfers minus direct personal taxes and mandatory employee contributions. As a measure of the extent of redistribution, we use the "share gain" of the bottom quintile, defined as the difference between the share of the bottom quintile in factor and disposable income. For example, if the bottom quintile receives 1% of total factor income, while the same people receive 10% of total disposable income, the share gain is 9 percentage points. We match these data with measures of national identification from the ISSP 1995 and the WVS, using the closest available LIS data point (see Data Appendix). Note that since we no longer require individual income data, we can now use the entire set of democracies covered by the WVS between 1981 and 1998.

Figure 5 presents the association between redistribution levels and national identification using the ISSP 1995. The horizontal axis measures the median of the six-item national identity scale described in the previous section. On the vertical axis we have the share gain of the bottom quintile. Panel (a) presents all democracies participating in the ISSP on which we also have data on the share gain. Panel (b) excludes the transition economies of Eastern Europe, that one would suspect had not yet reached

equilibrium by the time of these surveys. In both panels, a clear negative relationship appears. The relationship is particularly clean when we focus only on the long established western democracies, with Germany exhibiting very low national pride and very high levels of redistribution, and the USA among the proudest and least redistributive countries. To get a sense of the strength of the association, the R^2 from regressing the share-gain on national identification alone is 0.49 in the entire sample, and 0.72 in the sample without the transition economies.

Figure 6 repeats this exercise with the larger set of surveys available from the WVS. On the horizontal axis we now have the estimated fraction of the population in each country professing the highest level of national pride. The pattern is again extraordinarily clear, especially when we exclude the eastern European countries. The R^2 is 0.61 when we exclude eastern Europe and 0.46 for the entire sample. Note that the relationship is not simply driven by cross-Atlantic differences, and is remarkably strong within western Europe. It is also noteworthy that this pattern holds in spite of the commonly held view that the welfare state makes Europeans proud of their country: the more redistributive countries are actually characterized by *less* national pride.[56]

Most of the negative relationship comes from cross country variation and not variation within countries over time. Movements within countries – in both dimensions – are very small relative to the differences between countries. This suggests rather stable equilibria. To see this more clearly, Figure 7 presents the same data as in Figure 6(b) separately for each country on which we have more than one observation, maintaining the same scale for all countries. It may be interesting to note that most of the movements are in accordance with our model. In particular consider the movements that seem to have occurred between the early 80's and the mid 90's in the Netherlands, Denmark, Sweden and Norway. In all these countries, we observe an apparent shift to lower levels of redistribution, coupled with higher levels of national identification. The reverse seems to have happened in Canada and Spain (and perhaps also in France and Germany) where levels of redistribution increased and levels of national identification decreased during the 1990's. Why these changes might have happened is a matter for further research. Indeed some of these "changes" may be measurement noise. What we do want to emphasize then is the cross country pattern.

As a final robustness check, Figure 8 looks at an indirect measure of redistribution,

[56] Recall that the survey questions used are not using the word "nation" which may invoke various connotations, but ask "How proud are you to be French?" (WVS) or whether a respondent "would rather be a citizen of Sweden than of any other country in the world" (ISSP).

namely social welfare expenditure as percentage of GDP (OECD 2004). While this is an imperfect measure, a clear negative relationship is still apparent using both our measures of national identification. The data in panel (b) suggest that regional or cultural factors may also be at work, shifting both social spending and national identification down in Japan and Korea.[57] Finally, it is noteworthy that contrary to social welfare expenditure, *military* expenditure as a share of GDP is not negatively related to measures of national identification (in fact the correlation is weakly positive using the WVS data).

It is of course possible that the cross country correlation is driven by some other factors that affect both national identification and levels of redistribution, without the direct link between the two postulated by our model. However, the micro level results presented above somewhat limit the relevance of this possibility. As we have seen, the relationship between national identification and redistribution also holds at the individual level: within almost every western democracy, people who identify with their nation support less redistribution than people who do not. And in almost every country, lower income is associated with more national identification. If the general-interest long-run redistributive system reflects voters' preferences, then it would indeed be puzzling had the cross country patterns not reflected the micro results. Overall then, in advanced and well-established democracies, the data are remarkably consistent with the model.

6 Conclusion

Processes of social identification and their interactions with economic and political factors often seem very complex, and beyond the scope of economic theory. This paper attempted to employ robust regularities observed by social psychologists and experimental economists in order to render such processes amenable to standard economic analysis. As we have tried to show, the results obtained from such an analysis may in turn help tie together such previously disjointed phenomena as national identification, income inequality and political preferences.

Our application to redistribution focused on the endogeneity of group status, keeping perceived distance exogenous. One plausible extension is thus to endogenize the "supply" of distance. In particular, to examine politicians' incentives to promote a

[57] Interestingly, the large difference in social spending between these two countries corresponds to a difference in levels of national identification – much like the pattern across western democracies.

national language and culture versus advancing class differences or, in the shorter run, to take dramatic actions that change the salience of national-specific or class-specific attributes. Another extension we already alluded to concerns the set of social categories examined – with ethnic identity being a particularly important issue. But the model is flexible enough to allow for applications in areas other than political economy. Thus it could potentially contribute to our understanding of such issues as herd behavior, consumer choice, production in teams and peer effects in school.

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APPENDIX

A Proofs

Proof of Claim 1: This result follows from the properties of additively weighted power Voronoi diagrams (Okabe et al. 2000, ch. 3, properties PW1-PW3). To see this, suppose that $\langle a, g\rangle$ is a SIE and that $c = f(a)$. Then by SIE condition (ii) we have $g_i \in \arg\min_{j\in G} d_{ij}^2(c) - \frac{\gamma}{\beta}S_j(c)$ for all i. But this means that if i identifies with group j then $q_i \in V_j$, where V_j is the Voronoi region associated with q_j in the generalized Voronoi diagram generated by $\{q_j | j \in G\}$, with the distance given by $d(q_i, q_j) = d_{ij}^2(c) - \frac{\gamma}{\beta}S_j(c)$. The generator points (the prototypes) are thus additively weighted by the status of their associated groups (scaled by $\frac{\gamma}{\beta}$), whereas the attention weights w_h simply strech or shrink the conceptual space along its coordinate axes.■

Proof of Claim 3: By SIE condition (i), agents choose actions to maximize their utility given their social identity. Suppose that i identifies with group j to which he was assigned. He then chooses a_i to maximize (A1) subject to (4), (5) and (6). That is he seeks to maximize:

$$\begin{aligned} u(\pi_i, S_j, d_{ij}) &= \pi_i - \beta d_{ij}^2 + \gamma S_j \qquad (11)\\ &= \omega_i - a_i + \frac{\alpha}{n}\sum_{i\in j} a_i + \gamma\left(\sigma_0^j + \sigma_1\pi_j - \sigma_2\pi_{r(j)}\right)\\ &\quad -\beta\left(w_a(a_i - a_j)^2 + w_\pi(\pi_i - \pi_j)^2 + \sum_{h=3}^{H} w_h(q_i^h - q_j^h)^2\right). \end{aligned}$$

Using equation (4) we have:

$$\pi_j = \omega_j + \frac{\alpha - 1}{n}\sum_{i\in j} a_i = \omega_j + \frac{\alpha-1}{n}a_i + (\alpha - 1)\frac{n-1}{n}a_{j-i}$$

where $a_{j-i} \equiv \frac{1}{n-1}\sum_{i'\in j\setminus\{i\}} a_{i'}$ is mean contribution by *other* ingroup members. Plugging this into (11) and differentiating with respect to a_i (noting that $\pi_{r(j)}$ is independent of a_i) yields:

$$\begin{aligned} \frac{\partial u}{\partial a_i} &= \frac{\alpha - n}{n} + \gamma\sigma_1\frac{\alpha-1}{n} - 2\beta\left(w_a\frac{n-1}{n}(a_i - a_j) - w_\pi\frac{n-1}{n}(\pi_i - \pi_j)\right)\\ &= \left[(1+\gamma\sigma_1)\frac{\alpha}{n} - \frac{\gamma\sigma_1}{n} - 1\right] - 2\beta\left((w_a + w_\pi)\left(\frac{n-1}{n}\right)^2(a_i - a_{j-i}) - w_\pi\frac{n-1}{n}(\omega_i - \omega_j)\right). \end{aligned}$$

If $w_a + w_\pi = 0$ then the second term is zero (recall attention weights are nonnegative so $w_\pi = 0$). Hence the agent has a dominant strategy to contribute all his endowment

if the first term [in square brackets] is positive and to contribute zero if this term is negative (any amout is optimal if the term is zero). This term is increasing in the MPCR $\frac{\alpha}{n}$ (keeping n constant).

If $w_a + w_\pi > 0$, then the interior optimum is

$$\begin{aligned} a_i^* &= \frac{1}{2\beta\left(w_\pi + w_a\right)}\left(\frac{n}{n-1}\right)^2\left[(1+\gamma\sigma_1)\frac{\alpha}{n} - \frac{\gamma\sigma_1}{n} - 1\right] \\ &+ \frac{w_\pi}{w_\pi + w_a}\frac{n}{n-1}\left(\omega_i - \omega_j\right) + a_{j-i} \end{aligned} \tag{12}$$

and the agent contributes zero if $a_i^* < 0$ and ω_i if $a_i^* > \omega_i$ (since $\frac{\partial^2 u}{\partial a_i^2} < 0$). Thus the contribution level is again increasing in $\frac{\alpha}{n}$. It is also increasing in a_{j-i} and in $(\omega_i - \omega_j)$.

Finally, suppose that agent i was assigned to group j, but identifies with some group j', where $j \cap j' = \phi$. We also assumed that $d_{ij'}$ is unaffected by a_i. Since i's actions do not affect the material payoffs of any members of group j', the only way his actions can affect the status of j' is if members of j are in the reference group of j'. In this case maximizing the status of group j' implies contributing zero. Since maximizing own material payoff implies contributing zero for any given contribution profile by other agents, i's dominant strategy is to contribute zero.■

Proof of Claim 4: By Assumption 1, equations (7) (8) and the exogeneity of perceived distance, $t_j^*(y_p) \in \arg\max_{t\in[0,1]}\{\pi_p + \gamma S_j\} = \arg\max_{t\in[0,1]}\{(1-t)y_p + (t-t^2/2)y + \gamma S_j\}$. Note first that from equation (9) we have

$$\frac{\partial S_P}{\partial t} = \sigma_1^P(y - y_p - ty) - \sigma_2^P(y - y_r - ty).$$

Since the first term is nonnegative for $t \leq \widehat{t}$ and the second term is positive for $t \geq 0$, $\frac{\partial S_P}{\partial t}$ is strictly positive for all $t \in [0, \widehat{t}]$. Thus $\frac{\partial(\pi_p + \gamma S_P)}{\partial t} > 0$ for all $t \in [0, \widehat{t}]$. Hence $t_P^*(y_p) > \widehat{t}$. Second, note that from equations (9) and(10) we have

$$\frac{\partial S_N}{\partial t} = \sigma_1^N\left(\alpha(y - y_p - ty) + (1-\alpha)(y - y_r - ty)\right)$$

Thus $\frac{\partial S_N}{\partial t} \leq 0$ for $t \geq \widehat{t}$ and strictly negative for $t > \widehat{t}$. Therefore $\frac{\partial(\pi_p + \gamma S_N)}{\partial t} \leq 0$ for $t \geq \widehat{t}$ and strictly negative for all $t > \widehat{t}$. Hence $t_N^*(y_p) \leq \widehat{t}$. Therefore $t_N^*(y_p) < t_P^*(y_p)$.■

Proof of Claim 5:

Lemma 1 $S_N(t_P^*(y_p)) - S_P(t_P^*(y_p)) < S_N(t_N^*(y_p)) - S_P(t_N^*(y_p))$.

Proof: From the proof of Claim 4 we know that $t_P^*(y_p) > \widehat{t}$. Since $\widehat{t}$ maximizes π_p, it must be the case that $S_P(t_P^*(y_p)) > S_P(\widehat{t})$. But $\frac{\partial S_P}{\partial t} > 0$ for all $t \leq \widehat{t}$. Since $t_N^*(y_p) \leq \widehat{t}$ this implies $S_P\left(t_N^*(y_p)\right) \leq S_P(\widehat{t}) < S_P(t_P^*(y_p))$. By a similar argument $S_N(t_N^*(y_p)) \geq$

$S_N(\widehat{t})$. But $\frac{\partial S_N}{\partial t} < 0$ for all $t > \widehat{t}$. Since $t_P^*(y_p) > \widehat{t}$ this implies $S_N(t_P^*(y_p)) < S_N(\widehat{t}) \leq S_N(t_N^*(y_p))$. Together with the result on S_P this proves the lemma.■

We now prove the Claim.

(1) First note that the preferences of the poor over tax rates in the unit interval are single-peaked under both a national and a poor-class identity. To see this recall that the utility of a poor agent that identifies with group j is given by

$$U_p(t) = (1-t)y_p + (t - t^2/2)y + \gamma S_j - \beta d_{pj}. \tag{13}$$

If $j = N$ then $\frac{\partial^2 U_p}{\partial t^2} = -(1+\gamma\sigma_1^N)y < 0$. If $j = P$ then

$$\begin{aligned} \frac{\partial U_p}{\partial t} &= (1+\gamma\sigma_1^P)(y - y_p - ty) - \gamma\sigma_2^P(y - y_r - ty) \\ &= (1+\gamma\sigma_1^P)(y - y_p) - \gamma\sigma_2^P(y - y_r) - ty(1 + \gamma\sigma_1^P - \gamma\sigma_2^P). \end{aligned} \tag{14}$$

The first two terms in the last expression are positive, so if $(1 + \gamma\sigma_1^P - \gamma\sigma_2^P) \leq 0$ then $\frac{\partial U_p}{\partial t} > 0$ and preferences are single-peaked (with the peak at $t = 1$). If $(1+\gamma\sigma_1^P - \gamma\sigma_2^P) > 0$, then $\frac{\partial^2 U_p}{\partial t^2} < 0$ and again we have single-peakedness.

With single-peaked preferences, and given $f(a)$, it is a weakly dominant strategy for the poor to vote their preferred tax rate. Since the poor are the majority, by SIE condition (iii) in SIE we must have $t^* = t_{g_p}^*(y_p)$ where g_p is the group the poor identify with. Thus, by Claim 4, a relatively high tax rate (namely $t_P^*(y_p)$) will be chosen if the poor identify with their class, and a low tax rate (namely $t_N^*(y_p)$) if the poor identify with their nation. It remains to show that at least one of these is an equilibrium. Suppose $t_P^*(y_p)$ is not an equilibrium. This can only be the case if SIE condition (ii) is not satisfied, that is, at $t_P^*(y_p)$ the poor choose optimally not to identify with their class. This then implies that $\gamma\left(S_N(t_P^*(y_p)) - S_P(t_P^*(y_p))\right) > \beta(d_{pN}^2 - d_{pP}^2)$. But by Lemma 1 this implies $\gamma\left(S_N(t_N^*(y_p)) - S_P(t_N^*(y_p))\right) > \beta(d_{pN}^2 - d_{pP}^2)$ and hence $t_N^*(y_p)$ is an equilibrium.

(2) By assumption the poor either identify with their nation or with their class. SIE condition (ii) then implies that in equilibrium:

$$g_p \in \begin{cases} \{N\} & \text{if } \gamma\left(S_N(t^*) - S_P(t^*)\right) > \beta(d_{pN}^2 - d_{pP}^2) \\ \{P\} & \text{if } \gamma\left(S_N(t^*) - S_P(t^*)\right) < \beta(d_{pN}^2 - d_{pP}^2) \\ \{N, P\} & otherwise \end{cases}.$$

But from part (1) we know that in SIE $t^* = t_{g_p}^*(y_p)$. We thus obtain the following conditions:
(c1) $t_N^*(y_p)$ is an equilibrium if and only if $\gamma\left(S_N(t_N^*(y_p)) - S_P(t_N^*(y_p))\right) \geq \beta(d_{pN}^2 - d_{pP}^2)$.
(c2) $t_P^*(y_p)$ is an equilibrium if and only if $\gamma\left(S_N(t_P^*(y_p)) - S_P(t_P^*(y_p))\right) \leq \beta(d_{pN}^2 - d_{pP}^2)$.

Denote the difference in pre-tax income between rich and poor by $\delta \equiv y_r - y_p$. From

the specification of the conceptual space we have:

$$\begin{aligned} d_{pN}^2 &= w_y(y_p - y)^2 + \sum_{h=2}^{H} w_h(q_i^h - q_N^h)^2 \\ &= w_y\delta^2(1-\lambda)^2 + \sum_{h=\widehat{h}+1}^{H} w_h(1-\lambda)^2 \\ &= w_y\delta^2(1-\lambda)^2 + w_C(1-\lambda)^2 \end{aligned} \tag{15}$$

$$d_{pP}^2 = 0 \tag{16}$$

where $w_C \equiv \sum_{h=\widehat{h}+1}^{H} w_h = 1 - w_y - w_N$. From equations (9) and (10) we have:

$$\begin{aligned} S_N(t) - S_P(t) &= \sigma_0^N + \sigma_1^N\left(\alpha\pi_p(t) + (1-\alpha)\pi_r(t)\right) - \sigma_2^N\widetilde{\pi}_{r(N)} - \left(\sigma_0^P + \sigma_1^P\pi_p(t) - \sigma_2^P\pi_r(t)\right) \\ &= \sigma_0^N - \sigma_0^P - \sigma_2^N\widetilde{\pi}_{r(N)} + \left(\sigma_1^N\alpha - \sigma_1^P\right)\pi_p(t) + \left(\sigma_1^N(1-\alpha) + \sigma_2^P\right)\pi_r(t). \end{aligned} \tag{17}$$

Conditions (c1) and (c2) together with equations (15) and (16) yield the comparative statics in part 2a of the Claim; and with equation (17) yield the comparative statics in parts 2b and 2c.

(3) Consider a fall in the inter-class difference in pre-tax income $\delta \equiv y_r - y_p$, keeping all other parameters constant (including mean national income y and the proportion of the poor λ). This means pre-tax income inequality falls. To see that the effect on the equilibrium tax rate is ambiguous, consider the simple case where $\alpha = \lambda \in (0.5, 1)$ and $\sigma_1^P = \sigma_2^P = \sigma^P$ and suppose the economy is at a national-identity equilibrium. Note first that by equation (15), a fall in δ reduces d_{pN}^2. Second, from equations (17) (7) and (8) we have:

$$\begin{aligned} S_N(t) - S_P(t) &= \sigma_0^N - \sigma_0^P - \sigma_2^N\widetilde{\pi}_{r(N)} + \sigma_1^N\left(\lambda\pi_p + (1-\lambda)\pi_r\right) + \sigma^P(\pi_r - \pi_p) \\ &= \sigma_0^N - \sigma_0^P - \sigma_2^N\widetilde{\pi}_{r(N)} + \sigma_1^N(1 - t^2/2)y + \sigma^P(1-t)\delta \end{aligned} \tag{18}$$

Further, solving for the optimal tax rate for the poor under national identity we obtain:

$$t_N^*(y_p) = \frac{y - y_p}{y(1 + \gamma\sigma_1^N)} = \frac{(1-\lambda)\delta}{y(1+\gamma\sigma_1^N)} \tag{19}$$

Plugging (19) into (18) and differentiating with respect to δ yields:

$$\frac{\partial}{\partial\delta}\left(S_N(t_N^*(y_p)) - S_P(t_N^*(y_p))\right) = -\sigma_1^N\frac{(1-\lambda)^2\delta}{y(1+\gamma\sigma_1^N)^2} + \sigma^P\left(1 - \frac{2(1-\lambda)\delta}{y(1+\gamma\sigma_1^N)}\right) \tag{20}$$

Now, if this derivative is negative in the range of δ we're considering (e.g. if σ^P is sufficiently small), then the fall in δ causes both an increase in $S_N - S_P$ at $t_N^*(y_p)$ and a drop in $(d_{pN}^2 - d_{pP}^2)$. Condition (c1) therefore still holds and the economy is still at a

national-identity equilibrium. Note that the equilibrium tax rate is lower as a result of the lower δ (by equation (19)).

If on the other hand the derivative in equation (20) is positive in the range of δ we're considering (e.g. if λ is sufficiently large), then as δ falls so does $S_N - S_P$ at $t_N^*(y_p)$. If this change is large enough, condition (c1) may no longer hold, which implies that the economy switches to a class-identity equilibrium. The tax rate in this case is:

$$t_P^*(y_p) = \min\left\{\frac{y - y_p + \delta\gamma\sigma^P}{y}, 1\right\} = \min\left\{\frac{(1-\lambda+\gamma\sigma^P)\delta}{y}, 1\right\} \tag{21}$$

Let δ_0 be the inter-class difference in income before the change and $\delta_0 - \varepsilon > 0$ the inter-class difference after the change. Then using equations (19) and (21) the equilibrium tax rate has increased if

$$\frac{(1-\lambda+\gamma\sigma^P)(\delta_0-\varepsilon)}{y} > \frac{(1-\lambda)\delta_0}{y(1+\gamma\sigma_1^N)}$$

which again holds if λ is sufficiently large.

(4) Fix all the parameters of the model except σ_0^N. This implies that $t_N^*(y_p)$, $t_P^*(y_p)$ and $d_{pN}^2 - d_{pP}^2$ are fixed. By equation (18) there exists a $\sigma_0^N \in \mathbb{R}$ such that $S_N(t_N^*(y_p)) - S_P(t_N^*(y_p)) = \frac{\beta}{\gamma}(d_{pN}^2 - d_{pP}^2)$. By condition (c1) $t_N^*(y_p)$ is then an equilibrium. But by Lemma 1 we also have $S_N(t_P^*(y_p)) - S_P(t_P^*(y_p)) < \frac{\beta}{\gamma}(d_{pN}^2 - d_{pP}^2)$. Hence by condition (c2) $t_P^*(y_p)$ is an equilibrium. ■

Proof of Claim 6: Consider an SIE where the rich identify with the nation. Then by SIE condition (ii) we must have:

$$\gamma S_N - \beta d_{rN}^2 \geq \gamma S_R - \beta d_{rR}^2 \tag{22}$$

From the specification of the conceptual space we have:

$$d_{rN}^2 = w_y\lambda^2\delta^2 + w_c\lambda^2 \tag{23}$$

$$d_{rR}^2 = 0 \tag{24}$$

Plugging (23) and (24) into (22) and rearranging we get

$$\gamma S_N - \beta(1-\lambda)^2\left(w_y\delta^2 + w_c\right) \geq \gamma S_P + \gamma(S_R - S_P) + \beta(2\lambda-1)\left(w_y\delta^2 + w_c\right)$$

Or, using (15) and (16):

$$\gamma S_N - \beta d_{pN}^2 \geq \gamma S_P - \beta d_{pP}^2 + \gamma(S_R - S_P) + \beta(2\lambda-1)\left(w_y\delta^2 + w_c\right).$$

Thus if $S_R - S_P > -\frac{\beta}{\gamma}\left(w_y\delta^2 + w_c\right)(2\lambda - 1)$, then the poor identify with their nation.

Consider on the other hand an SIE where $\gamma S_N - \beta d_{pN}^2 = \gamma S_P - \beta d_{pP}^2$ and the poor identify with the nation. If the condition $S_R - S_P > -\frac{\beta}{\gamma}\left(w_y\delta^2 + w_c\right)(2\lambda - 1)$ holds,

then the rich do not identify with the nation since $\gamma S_N - \beta d_{rN}^2 < \gamma S_R - \beta d_{rR}^2$.■

Proof of Claim 7:

Let q_i^x equal unity if agent i has attribute x and zero otherwise, and call these agents type 1 and type 0 respectively. Let $w_x > 0$ be the associated attention weight and $\mu < 0.5$ be the proportion of poor agents that are type 1. All other attributes are as before. Finally, assume that $\sigma_2^R \leq \sigma_1^R + 1/\gamma$.

Note first that policy preferences are unaffected by perceived distance. Thus, policy preferences of the poor are still single-peaked and the preferred policies under class and national idenitty unchanged. For rich agents we have:

$$U_r(t) = (1-t)y_r + (t - t^2/2)y + \gamma S_j - \beta d_{Rj}.$$

If $j = N$ then $\frac{\partial^2 U_r}{\partial t^2} = -(1 + \gamma\sigma_1^N)y < 0$ hence single-peaked. Comparing the solution to maximizing $U_r(t)$ and $U_p(t)$ (from equation (13)) under national identity implies:

$$t_N^*(y_r) \leq t_N^*(y_p). \tag{25}$$

If $j = R$ then under $\sigma_2^R \leq \sigma_1^R + 1/\gamma$, utility is monotonically decreasing in t, and hence single-peaked. Further:

$$t_R^*(y_r) = 0 \leq t_N^*(y_p). \tag{26}$$

Since preferences are single-peaked, in any SIE all agents vote their preferred tax rates.

Consider now perceived distances. Modifying equations (15) and (16) to include the new dimension, perceived distances of poor agents are:

$$d_{iN}^2 = \begin{cases} w_y\delta^2(1-\lambda)^2 + w_C(1-\lambda)^2 + w_x(1-\lambda\mu)^2 & \text{if } q_i^x = 1 \text{ and } y_i = y_p \\ w_y\delta^2(1-\lambda)^2 + w_C(1-\lambda)^2 + w_x(\lambda\mu)^2 & \text{if } q_i^x = 0 \text{ and } y_i = y_p \end{cases} \tag{27}$$

$$d_{iP}^2 = \begin{cases} w_x(1-\mu)^2 & \text{if } q_i^x = 1 \text{ and } y_i = y_p \\ w_x\mu^2 & \text{if } q_i^x = 0 \text{ and } y_i = y_p \end{cases} \tag{28}$$

Therefore:

$$\begin{aligned} \Delta_1 &\equiv (d_{iN}^2 - d_{iP}^2 | q_i^x = 1 \text{ and } y_i = y_p) \\ &= w_y\delta^2(1-\lambda)^2 + w_C(1-\lambda)^2 + w_x\left((1-\lambda\mu)^2 - (1-\mu)^2\right) \end{aligned} \tag{29}$$

$$\begin{aligned} \Delta_0 &\equiv (d_{iN}^2 - d_{iP}^2 | q_i^x = 0 \text{ and } y_i = y_p) \\ &= w_y\delta^2(1-\lambda)^2 + w_C(1-\lambda)^2 + w_x\mu^2(\lambda^2 - 1) \end{aligned} \tag{30}$$

We now show that in any SIE, the chosen tax rate is the one preferred by the type 0 poor. From (29) and (30) we have:

$$\Delta_1 - \Delta_0 = 2\mu w_x(1-\lambda) > 0. \tag{31}$$

Thus, whenever type 0 poor identify with the poor class, so do type 1 poor. Since the poor are a majority, the chosen tax rate is $t_P^*(y_p)$. If type 0 poor identify with the nation and type 1 poor identify with the nation then by majority of the poor the chosen tax rate is $t_N^*(y_p)$. Finally, if type 0 poor identify with the nation and type 1 poor identify with their class, then by (25), (26) and Claim 4 and by the fact that neither the rich nor the type 1 poor are the majority, type 0 poor are the median voter. The equilibrium conditions are thus still (c1) and (c2), but with $d_{pN}^2 - d_{pP}^2 = \Delta_0$ in the statement of both conditions.

From (30) it is clear that Δ_0 is decreasing in μ. Thus, starting from an SIE with $t^* = t_N^*(y_p)$ an increase in μ does not change the equilibrium tax rate (condition (c1) still holds). Conversely, starting from an SIE with $t^* = t_P^*(y_p)$ an increase in μ may imply that condition (c2) no longer holds, and the unique equilibrium is $t^* = t_N^*(y_p)$.■

B Data

B.1 WVS Household Income Data:

All WVS Data are from the first three waves of the WVS (Inglehart et al. 2000). The World values survey reports a measure of total, pre-tax household income "counting all wages, slalries, pensions and other incomes that come in... before taxes and other deductions" For most countries, household income is reported in ten categories, usually running from 1 to 10, where the lowest and uppermost categories are open ended.[58]. The data used for individual level analysis in this paper are only from those countries where the income categories cutoff points is known. Contrary to the impression one might get from the WVS literature, these income categories are not deciles. A minor problem arises, therefore, of assigning individuals a level of income based on the reported categories, that is, of assigning a specific point within the reported interval. This is done here by assuming a log-normal distribution of household income within each nation and wave, and estimating the parameters of the distribution by maximum likelihood. Once one has the distribution, each individual is assigned the median point conditional on the interval within which her income lies. All calculations were performed using the sampling weights in the different nations and waves.

B.2 WVS Household Size Data

Information related to household size in the world values surveys is indirectly available from the following questions:

- Have you had any children? IF YES, how many?
- How many of them are still living at home? [asked in second wave only]
- Do you live with your parents?
- Are you currently....(1) Married; (2) Living as married; (3) Divorced; (4) Separated; (5) Widowed; (6) Single

[58]The USA in the second wave has several open categories at the top. This does not alter the form of the likelihood function used to estimate the distribution.

Since in the second wave we have data on number of children still living at home, we can reasonably impute household size for most respondents. However, there is no clear way to predict household size for young respondents living with their parents. For the third wave we do the following. First we estimate for each country participating in the second wave household-size equations, using as regressors the above mentioned questions that appear in both waves, as well as sex, income and religion (the fit was good in all regressions: R^2 around 0.7). We then use the obtained coefficients to predict household size for wave 3. For countries that did not participate in the second wave we use coefficients from neighboring countries with similar distribution of number of children. Once again, household size cannot be predicted for young respondents living with parents. Missing values for household size are "dummied out" in the regressions.

B.3 Definition of Democracy

The definition is based only what Freedom House defines as "political rights" which is a measure of the existence of free, open and fair elections that determine who actually rule. We do not use the other component – "civil liberties" – to filter out non-democracies. Specifically, we define as democracies all countries whose Freedom House (2003) score for Political Rights is either 1 or 2. These are characterized as follows:

Rating of 1—Countries and territories that receive a rating of 1 for political rights come closest to the ideals suggested by the checklist questions, beginning with free and fair elections. Those who are elected rule, there are competitive parties or other political groupings, and the opposition plays an important role and has actual power. Minority groups have reasonable self-government or can participate in the government through informal consensus.

Rating of 2—Countries and territories rated 2 in political rights are less free than those rated 1. Such factors as political corruption, violence, political discrimination against minorities, and foreign or military influence on politics may be present and weaken the quality of freedom.

B.4 Matching LIS Household Income Surveys in the Milanovic (2000) data with WVS and ISSP data

Table A1: WVS and LIS

WVS	LIS survey	WVS	LIS survey
Australia 81	1981	Italy 81	1986
Australia 95	1994	Italy 90	1991
Belgium 81	1985	Netherlands 81	1983
Belgium 90	1988	Netherlands 90	1991
Britain 81	1979	Norway 81	1979
Britain 90	1991	Norway 90	1991
Britain 98	1995	Norway 96	1995
Canada 81	1981	Poland 96	1995
Canada 90	1991	Slovakia 90	1992
Czech 90	1992	Spain 81	1980
Denmark 81	1987	Spain 90	1990
Denmark 90	1992	Sweden 81	1981
East Germany 97*	1994	Sweden 90	1992
Finland 90	1991	Sweden 96	1995
Finland 96	1995	USA 81	1979
France 81**	1979	USA 90	1991
France 90	1989	USA 95	1994
Hungary 90	1991	West Germany 81	1981
Ireland 90	1987	West Germany 90	1989
		West Germany 97*	1994

* The WVS maintained the separation of East and West Germany in the 1997 survey. Both are matched to the same 1994 LIS household survey, taken in the unified Germany.

** We use the 1979 LIS rather than the 1981, since the 1981 data yield a gross outlier compared to other France household surveys. The share gain of the bottom quintile is 12.6, 13.7 and 15 in 1979, 1984 and 1989, respectively; but it is only 4.5 in the 1981 survey (see Milanovic 2000, Appendix B).

Table A2: ISSP 1995 and LIS

ISSP 1995	LIS survey
Australia	1994
Canada	1994
Czech-Rep.	1992
Germany*	1994
Great-Britain	1995
Hungary	1991
Ireland	1987
Italy	1995
Netherlands	1994
Norway	1995
Poland	1995
Russia	1995
Slovak-Rep.	1992
Spain	1990
Sweden	1995
United-States	1994

* The ISSP 1995 included separate surveys for East and West Germany. Both are matched to the same 1994 LIS household survey, taken in the unified Germany.

B.5 Means, Medians and Standard Deviations of Variables Used in Estimations

Table A3: WVS Micro Data

Survey and year	N	Support for Redistribution			Household Income		National Pride		Fraction Male	Age	
		Median	Mean	SD	Mean	SD	Fraction Very Proud	Fraction Quite Proud		Mean	SD
Austria 90	1324	6	5.56	3.03	254820	125122.70	0.53	0.40	0.39	46.83	17.00
Belgium 90	1517	4	5.09	2.94	767466	362234.00	0.31	0.50	0.51	45.27	16.78
Brazil 90	1622	5	5.18	3.29	1359695	1883210.00	0.64	0.23	0.51	36.26	12.57
Britain 90	1046	4	4.45	2.44	12961	8336.52	0.52	0.37	0.50	46.60	18.02
Bulgaria 98	785	5	5.55	2.78	2956961	3033386.00	0.51	0.35	0.49	47.66	17.82
Canada 90	1423	3	4.23	2.86	40922	21782.22	0.60	0.34	0.51	42.73	16.06
Chile 90	1445	5	5.01	3.19	820766	724468.70	0.53	0.34	0.48	38.53	15.69
E Germany 90	1181	3	3.38	2.60	21142	8157.68	0.29	0.45	0.47	44.68	16.72
Estonia 96	762	6	5.66	2.49	29521	15251.64	0.22	0.46	0.43	43.25	15.48
Finland 90	549	4	4.38	2.77	157302	62467.65	0.38	0.45	0.52	41.08	13.85
Hungary 90	918	5	5.21	2.96	228673	137771.60	0.47	0.41	0.49	45.60	16.61
India 90	2279	5	5.03	2.97	29198	17905.73	0.76	0.19	0.56	35.23	13.21
Italy 90	1363	5	5.12	2.89	28200000	22300000.00	0.40	0.48	0.51	42.15	15.83
Japan 90	724	5	5.30	2.26	6151936	2704937.00	0.29	0.38	0.51	42.76	13.94
Japan 95	770	5	5.49	2.17	6830066	3071068.00	0.26	0.38	0.52	45.96	14.68
Latvia 96	879	4	4.62	2.39	1903	1129.55	0.23	0.45	0.43	42.14	16.17
Netherlands 90	752	4	4.81	2.04	48962	23881.90	0.22	0.53	0.48	42.94	15.90
Portugal 90	1089	7	6.66	2.81	1110523	737980.70	0.42	0.49	0.49	41.97	17.47
Spain 90	3180	6	6.02	2.71	1427371	802874.10	0.45	0.42	0.48	42.49	17.16
Spain 96	843	6	5.50	2.81	1724178	1508714.00	0.68	0.25	0.50	45.29	17.78
Sweden 96	867	5	5.13	2.15	277828	125906.40	0.47	0.43	0.51	44.28	16.04
Switzerland 96	889	6	6.25	3.03	52043	25724.76	0.28	0.50	0.50	45.91	17.23
Turkey 90	971	7	6.42	3.23	12600000	17400000.00	0.67	0.25	0.50	36.30	14.07
USA 90	1614	4	4.21	2.53	31883	16547.45	0.75	0.23	0.51	46.25	17.30
USA 95	1320	6	5.52	2.71	38832	23916.44	0.80	0.18	0.50	47.99	17.70
Venezuela 96	1059	6	5.47	3.31	846149	786467.00	0.94	0.05	0.50	36.17	13.94
W Germany 90	1600	4	4.77	2.75	49664	21806.48	0.19	0.49	0.50	45.92	17.63

Unweighted data. The Support for Redistribution variable takes values from {1,2,…,10}. Household income is annual in local currency (see Appendix B.1).

Table A4: ISSP 1995 Micro Data

Nation	N	National Identity Scale			Household Income		Years of Schooling		Fraction Male	Age	
		Median	Mean	SD	Mean	SD	Mean	SD		Mean	SD
Australia	1947	16	16.01	3.21	48195.94	42266.84	12.21	4.11	0.51	47.83	14.98
Austria	698	17	16.52	4.12	23010.74	10151.84	11.55	9.82	0.47	46.19	16.90
Bulgaria	634	16	15.81	3.84	8648.85	6735.85			0.51	48.45	16.58
Canada	1162	16	15.46	3.75	47504.30	24278.79	15.09	4.07	0.49	41.16	14.91
Czech-Republic	596	13	12.81	3.40	12328.43	10941.97	16.32	16.56	0.54	43.91	15.78
E-Germany	433	11	11.31	4.43	3093.30	1350.63	14.44	16.41	0.52	47.04	15.53
Great-Britain	805	14	14.34	3.70	17575.16	12329.24	12.46	9.47	0.43	46.09	17.03
Hungary	734	15	14.79	3.49	37776.65	27796.47	11.03	5.53	0.45	46.49	17.35
Ireland	817	16	15.89	2.99	17413.05	10168.52	12.28	3.18	0.49	46.02	16.14
Italy	1017	12	11.98	3.85	2849.80	1347.80	11.22	4.50	0.50	42.47	15.44
Japan	782	15	14.53	3.61	7255.12	4029.56	14.54	13.40	0.50	46.42	15.02
Latvia	468	13	13.16	3.71	99.37	80.49	12.12	3.91	0.37	45.26	16.82
Netherlands	1174	13	12.68	3.27	68522.57	34511.15	13.55	4.16	0.52	42.73	15.40
New-Zealand	797	16	15.75	2.98	45974.28	23966.59	15.01	7.91	0.49	45.42	16.07
Norway	1083	15	14.47	3.41	318993.50	144173.20	23.39	27.55	0.52	42.17	16.49
Poland	1005	14	14.13	3.29	800.46	573.64	10.97	6.20	0.49	46.25	16.54
Russia	834	14	13.79	3.52	4631.83	59850.01	11.60	5.47	0.47	45.18	15.53
Slovak-Republic	1012	12	11.81	4.08	10742.22	8436.43	15.15	16.14	0.50	41.57	16.42
Slovenia	464	14	13.84	3.69	121855.60	90692.52	15.88	19.37	0.47	42.65	15.12
Spain	714	15	14.52	3.35	141838.20	92814.18	15.39	21.43	0.51	44.72	17.96
Sweden	882	13	13.13	3.55	21162.13	9583.84	11.95	5.72	0.53	44.67	15.50
United-States	1048	16	15.71	3.37	38080.25	24485.75	13.64	3.79	0.46	43.57	15.80
W-Germany	901	11	11.27	4.66	3847.73	1622.77	14.96	18.06	0.57	46.47	15.70

Unweighted data. See text for definition of National Identity scale. It takes values from {0,1,2,…,24} Household income in local currency, definitions vary across surveys. Years of schooling measure number of years of full time schooling except in Great-Britain where it is recoded from age when completed full time education.

Table 1: Support for Redistribution, Income and National Pride

Survey and Year	log Income		Very Proud		Quite Proud		N
Austria 90	-0.903**	(0.172)	-0.638**	(0.318)	-0.301	(0.319)	1323
Belgium 90	-1.152**	(0.182)	-0.152	(0.217)	-0.120	(0.188)	1517
Brazil 90	-0.324**	(0.083)	0.128	(0.249)	-0.062	(0.271)	1622
Britain 90	-0.868**	(0.120)	-0.572**	(0.285)	-0.316	(0.285)	1046
Bulgaria 98	-0.373**	(0.154)	-0.297	(0.285)	-0.239	(0.283)	767
Canada 90	-0.646**	(0.140)	-0.715**	(0.332)	-0.436	(0.339)	1422
Chile 90	-0.503**	(0.118)	-0.373	(0.261)	-0.436	(0.271)	1441
E Germany 90	-0.548**	(0.249)	-0.715**	(0.212)	-0.359**	(0.181)	1181
Estonia 96	-0.895**	(0.197)	0.229	(0.255)	0.225	(0.209)	762
Finland 90	-0.835**	(0.284)	-0.722*	(0.371)	-0.529	(0.362)	549
Hungary 90	-1.204**	(0.181)	0.171	(0.282)	0.457*	(0.276)	918
India 90	-0.395**	(0.113)	0.409	(0.261)	0.217	(0.285)	2279
Italy 90	-0.771**	(0.136)	-0.255	(0.261)	-0.109	(0.245)	1363
Japan 90	-0.951**	(0.186)	-0.872**	(0.217)	-0.588**	(0.191)	723
Japan 95	-1.092**	(0.180)	-0.381*	(0.213)	-0.281*	(0.170)	770
Latvia 96	-0.610**	(0.146)	-0.977**	(0.236)	-0.299	(0.182)	879
Netherlands 90	-0.936**	(0.152)	-0.454**	(0.222)	-0.447**	(0.180)	752
Portugal 90	-0.721**	(0.149)	-0.229	(0.306)	-0.120	(0.300)	1089
Spain 90	-0.766**	(0.105)	-0.694**	(0.151)	-0.701**	(0.146)	3180
Spain 96	-0.244	(0.172)	-0.202	(0.392)	0.136	(0.412)	842
Sweden 96	-0.691**	(0.167)	-0.226	(0.250)	-0.079	(0.249)	867
Switzerland 96	-1.234**	(0.211)	-0.763**	(0.294)	-0.480*	(0.253)	887
Turkey 90	-0.468**	(0.119)	-1.747**	(0.341)	-1.723**	(0.366)	968
USA 90	-0.240*	(0.126)	-2.063**	(0.529)	-1.611**	(0.537)	1560
USA 95	-0.358**	(0.123)	-0.904*	(0.530)	-0.672	(0.541)	1310
Venezuela 96	-0.403**	(0.151)	-0.021	(0.788)	-0.761	(0.917)	1059
W Germany 90	-1.091**	(0.185)	-1.253**	(0.205)	-0.740**	(0.154)	1600

WVS data. OLS, robust standard errors in parentheses. Each row is a separate regression. Dependent variable is support for redistribution, ranging from 1 ("We need larger income differences as incentives for individual effort") to 10 ("Incomes should be made more equal"). Reported are the estimated coefficients on log household income, and two dummies for national pride: "very proud" and "quite proud". Omitted categories are "not proud" and "not at all proud".

All regressions control for log of household size, sex, age, and age squared. All regressions except Turkey 1990 also control for years of education. Missing values for household size and years of education are dummied out.

** Denotes significantly different from zero at the 5 % level.

* Denotes significantly different from zero at the 10 % level.

Table 2: National Identification, Income and Years of Schooling

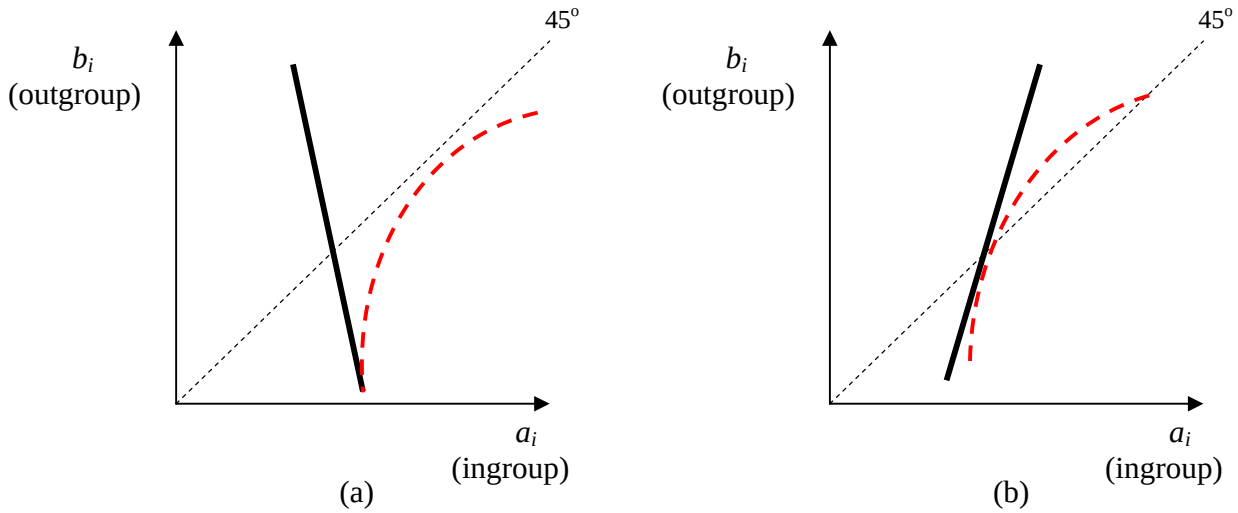
Nation	(1) log Income		N	(2) log Income		Years of Schooling		N
Australia	-0.169	(0.110)	1889	-0.037	(0.127)	-0.100**	(0.046)	1889
Austria	-0.520	(0.338)	698	-0.530	(0.338)	-0.018	(0.021)	698
Bulgaria	-0.538**	(0.189)	633	.	.	.	.	0
Canada	-0.228	(0.181)	1106	0.288	(0.200)	-0.195**	(0.031)	1081
Czech Rep.	-1.033**	(0.296)	593	-1.005**	(0.298)	-0.012	(0.011)	591
E-Germany	-0.870**	(0.443)	433	-0.991**	(0.422)	-0.051**	(0.014)	417
Great-Britain	-0.793**	(0.181)	805	-0.823**	(0.179)	-0.034**	(0.014)	805
Hungary	-1.084**	(0.271)	734	-1.020**	(0.277)	-0.044	(0.029)	734
Ireland	-0.530**	(0.178)	817	-0.471**	(0.191)	-0.030	(0.037)	813
Italy	-0.807**	(0.259)	1017	-0.120	(0.270)	-0.216**	(0.032)	1017
Japan	-0.776**	(0.237)	782	-0.777**	(0.238)	-0.009	(0.010)	778
Latvia	-0.346	(0.221)	468	-0.215	(0.235)	-0.094**	(0.046)	467
Netherlands	-0.952**	(0.183)	1174	-0.677**	(0.185)	-0.153**	(0.028)	1174
New Zealand	-0.502**	(0.195)	787	-0.902**	(0.269)	0.025	(0.024)	368
Norway	-0.647**	(0.199)	1083	-0.783**	(0.211)	-0.019**	(0.005)	1010
Poland	-1.150**	(0.172)	1005	-1.081**	(0.176)	-0.038*	(0.022)	1005
Slovak Rep.	-0.733**	(0.246)	1012	-0.735**	(0.246)	0.001	(0.008)	1012
Slovenia	-0.826**	(0.301)	463	-0.780**	(0.303)	-0.011	(0.008)	459
Spain	-0.910**	(0.222)	714	-0.901**	(0.225)	0.009	(0.005)	700
Sweden	-0.999**	(0.245)	882	-0.689**	(0.261)	-0.110**	(0.039)	826
United-States	-0.516**	(0.110)	1045	-0.355**	(0.165)	-0.160*	(0.091)	1045
W-Germany	-1.097**	(0.337)	900	-0.894**	(0.341)	-0.022**	(0.009)	875

ISSP 1995 data. OLS, robust standard errors in parentheses. Dependent variable is national identification scale. Each row reports the coefficient on the log of household income from two separate regressions. The regressions in column (1) do not control for years of schooling, while those in column (2) do, with the estimated coefficient reported. Samples do not include non-citizens. All regressions control for sex, age and log of household size. Missing values for household-size are dummied out.

** Denotes significantly different from zero at the 5 % level.

* Denotes significantly different from zero at the 10 % level.

Figure 1: Typical Choice Sets in Minimal Group Experiments



The solid lines represent continuous versions of the commonly used "Tajfel Matrices" (Tajfel et al., 1971). Panel (a) presents a choice between "Maximum Joint Profits" and both "Maximum Difference" and "Maximum Ingroup Profits". Panel (b) presents a choice between "Maximum Difference" and both "Maximum Ingroup Profits" and "Maximum Joint Profits". The dashed curves represent possible indifference curves of an agent that identifies with the ingroup.

Figure 2: The Voter's Choice Set

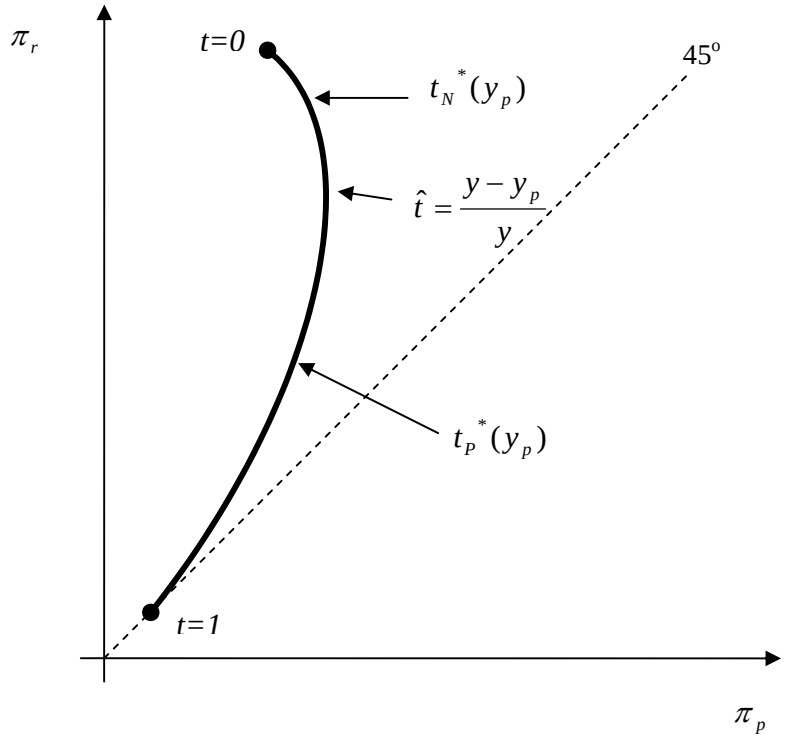


Figure 3: Social Identity Equilibria

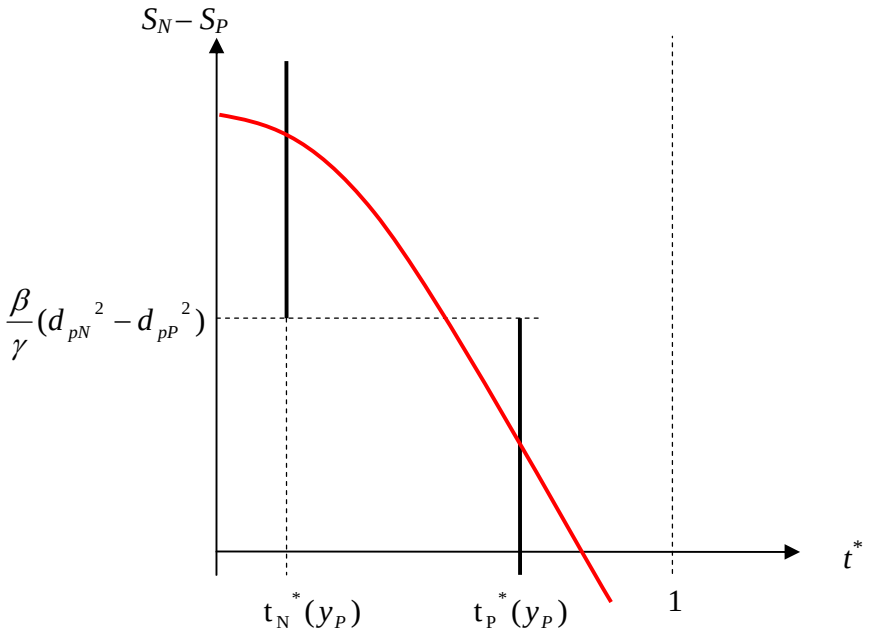


Figure 4: Support for Redistribution by National Identity and Income

a. Advanced Economies

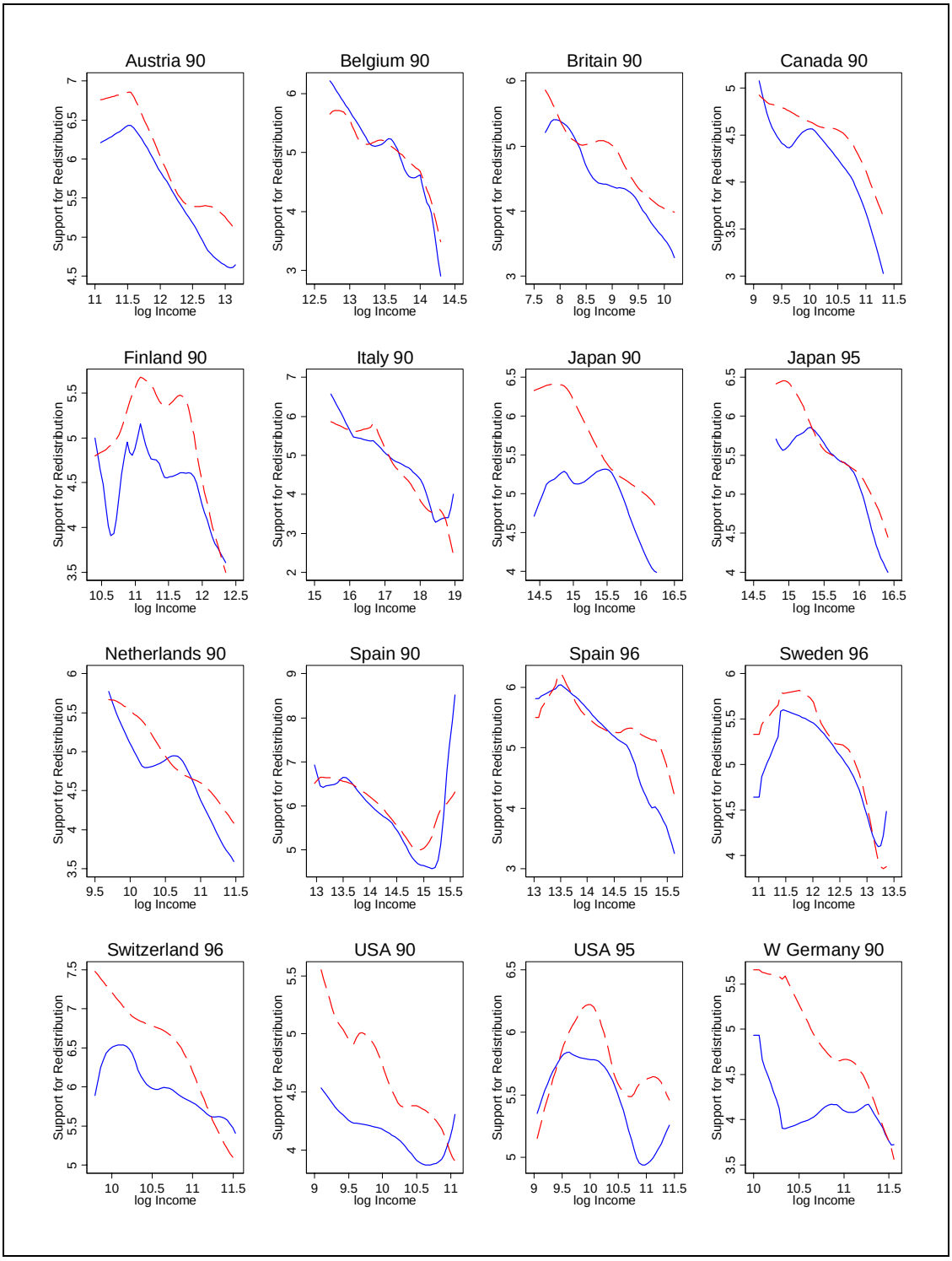
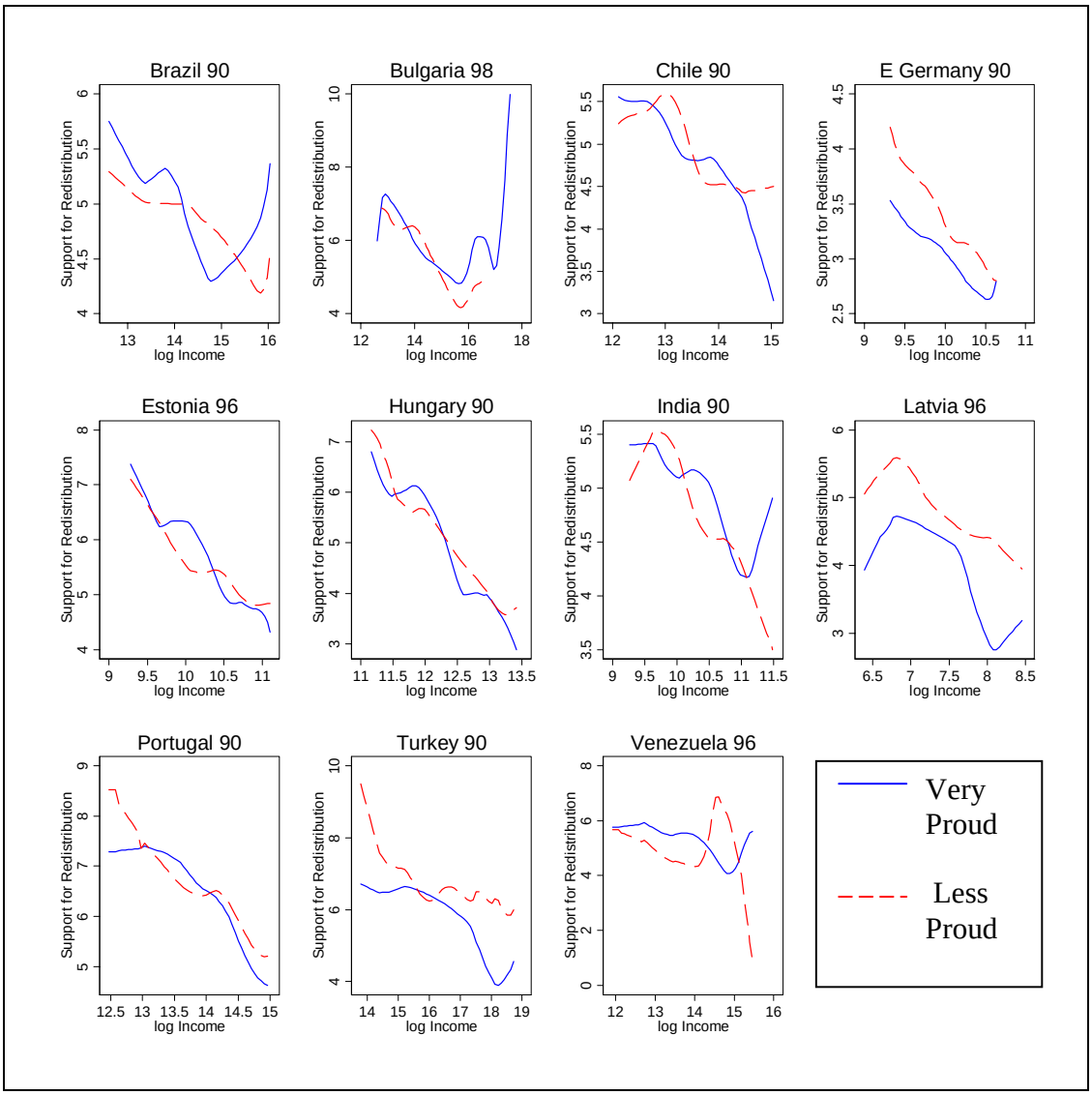


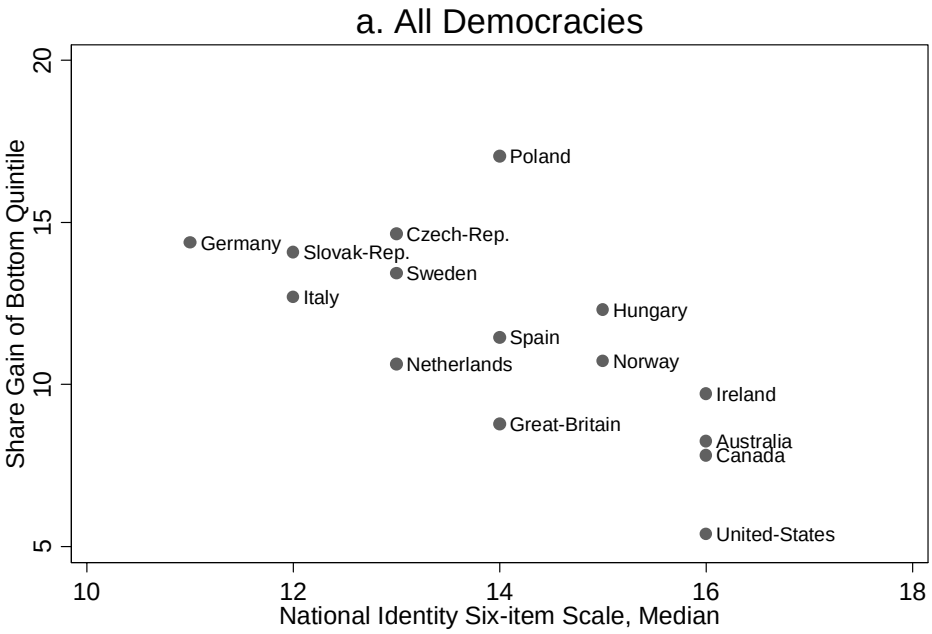
Figure 4 (continued): Support for Redistribution by National Identity and Income

b. Less Advanced Economies

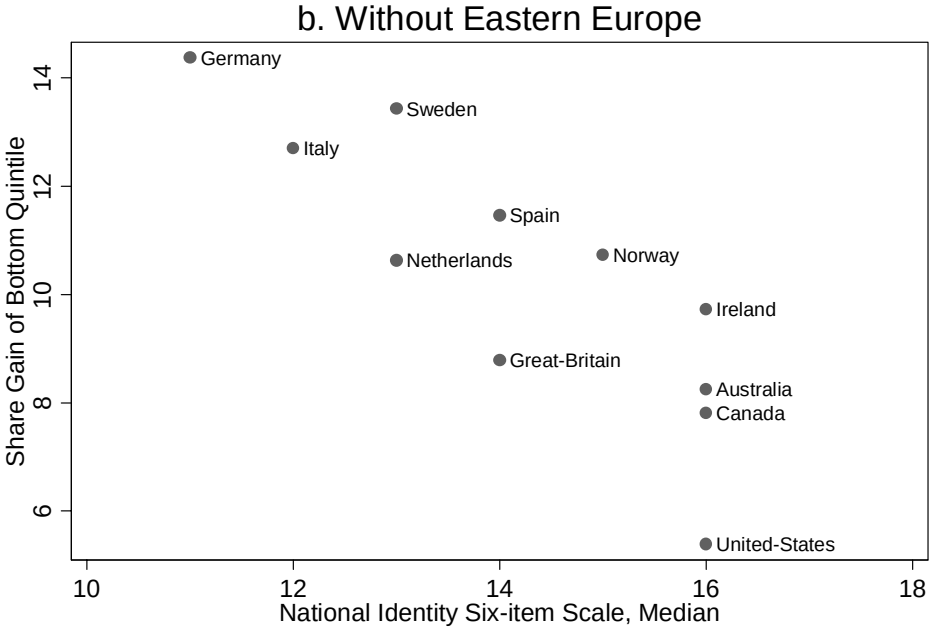


1. WVS data. Locally weighted regressions, Fan (1992), with quartic kernels.
2. Household income is in local currency, bandwidths vary accordingly from 0.3 in Britain and West Germany to 0.9 in Turkey. The top or bottom income category is dropped if it contains less than 1% of the relevant sample. Thus the bottom category is dropped in USA 95 and the top category is dropped in Brazil 90, Hungary 90, India 90, Italy 90, Spain 96, Turkey 90, USA 90 and Venezuela 96. The observed hump shape in Finland 90 and Sweden 96 is caused by the bottom category, containing 15 (2.3%) and 14 (2.6%) observations respectively. The hump shape in USA 95 is caused by the second category, with 71 observations.
3. Support for redistribution is on a 1 to 10 scale (see Appendix B.3).
4. Each survey population is divided according to whether respondents are "very proud" to be members of their nation (the highest possible level) or not. The solid line is the regression function of support for redistribution among the very proud. The dashed line is that regression for respondents with lower national pride.
5. Economies are divided into "Advanced" and "Less Advanced" according to whether real GDP per capita (PWT 6.1) is less than 50% of USA real GDP per capita.

Figure 5: Redistribution and National Identity: ISSP data



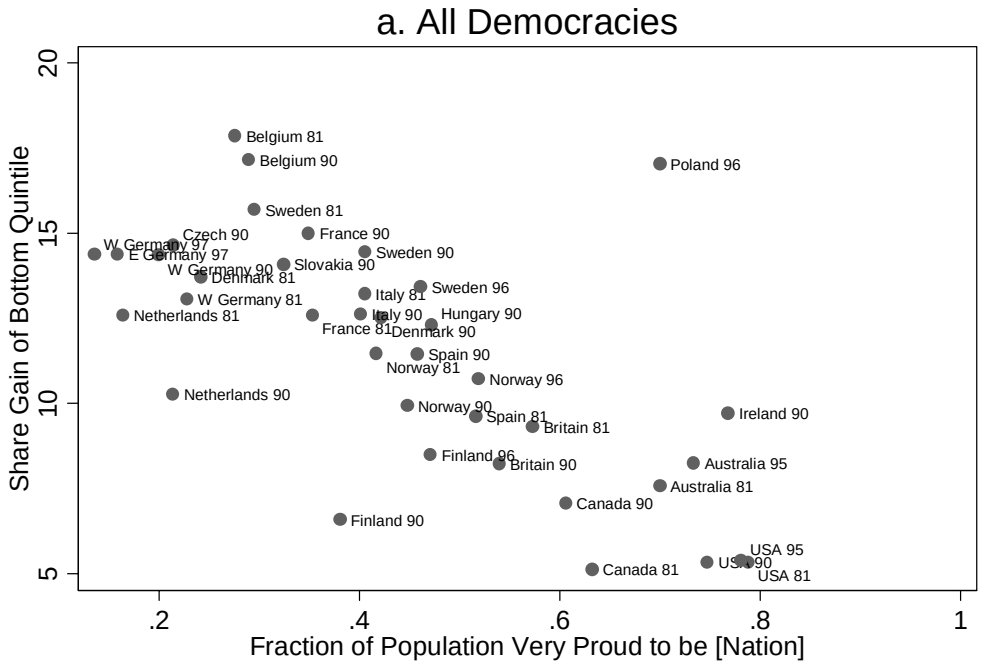
N = 15. R - squared = 0.49.

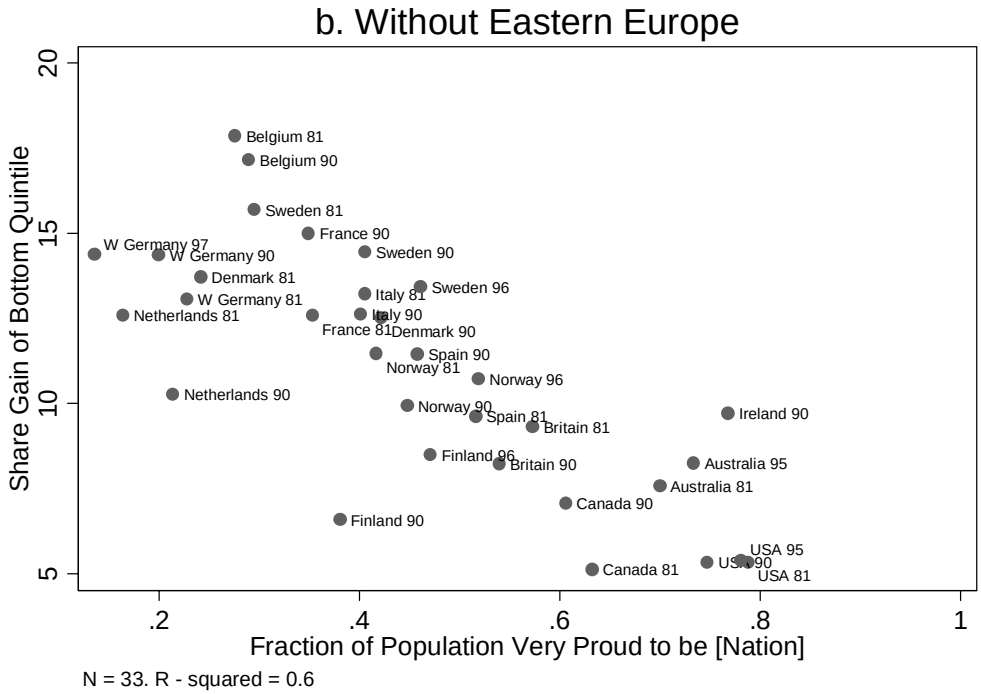


N = 11. R - squared = 0.72.

National identity scale from ISSP 1995 (see main text for details). Share gain from LIS (Milanovic 2000). Data are taken from the LIS household income surveys closest to 1995 (see Data Appendix). Germany is represented as a single point since the median national identity score is identical in both East and West Germany.

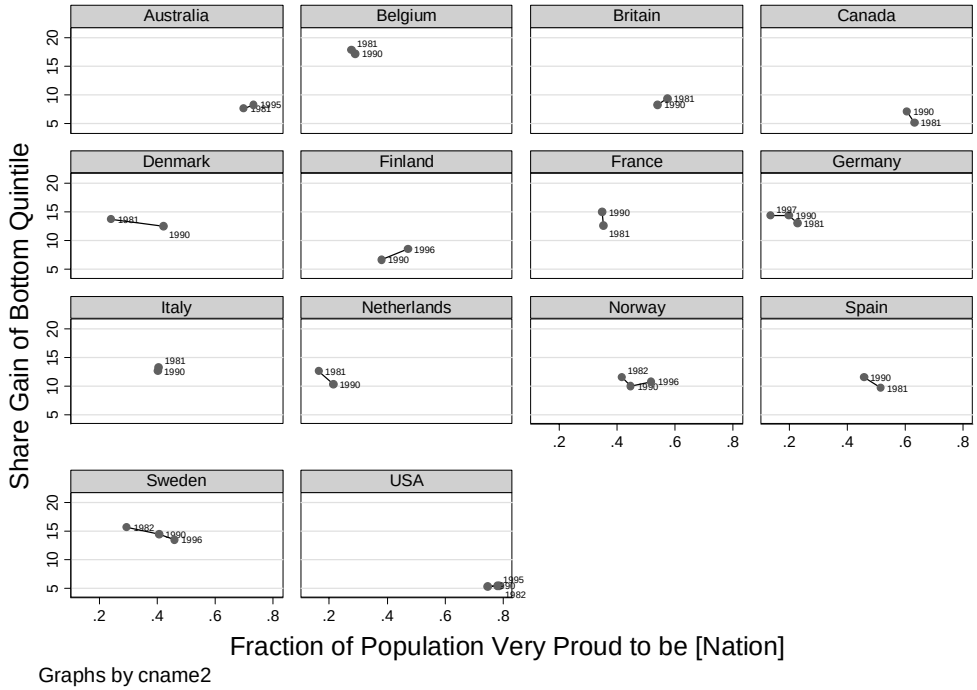
Figure 6: Redistribution and National Identity: WVS data





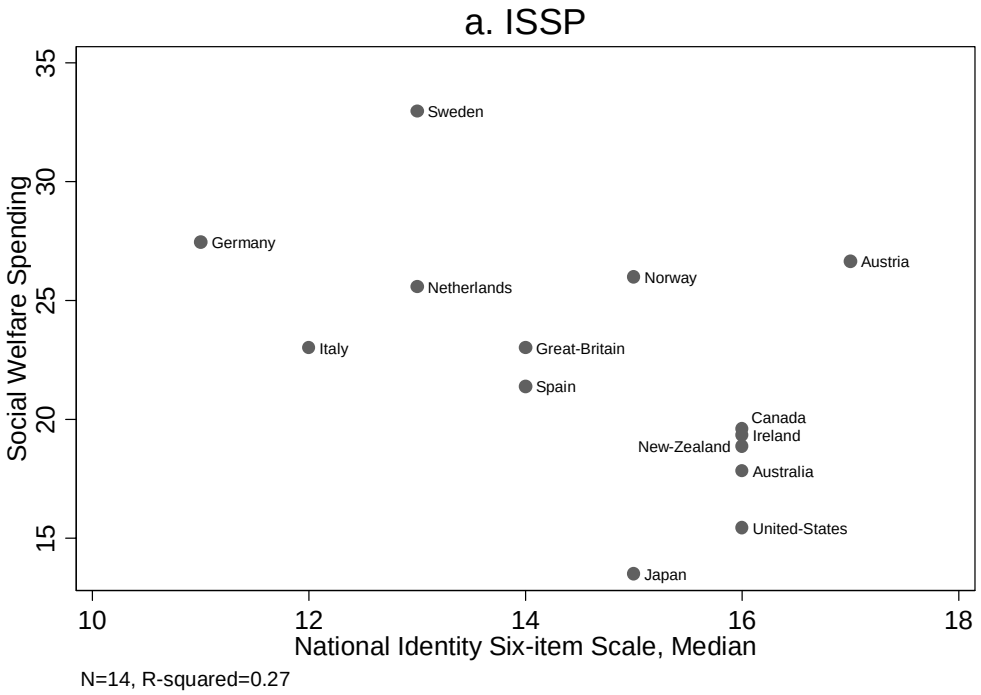
Fraction very proud from WVS waves 1-3. Share gain from LIS (Milanovic 2000). Data are taken from the LIS household income surveys closest to the WVS survey (see Data Appendix).

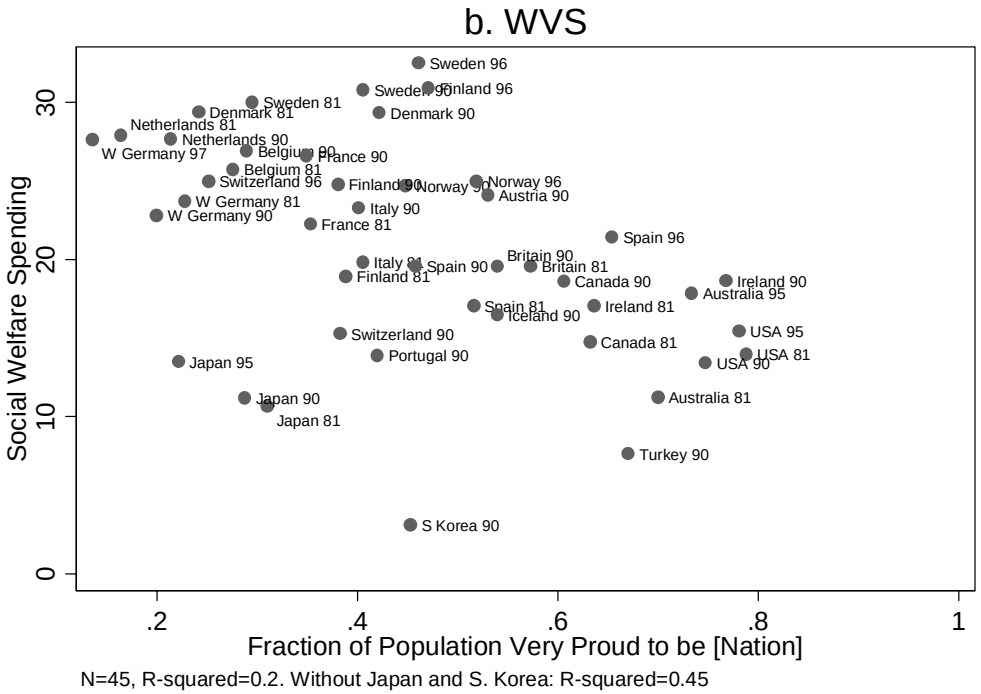
Figure 7: Redistribution and National Identity Within countries Over Time
WVS data



Fraction very proud from WVS waves 1-3. Share gain from LIS (Milanovic 2000). Data are taken from the LIS household income surveys closest to the WVS survey (see Data Appendix). Germany WVS data are from West Germany.

Figure 8: Social Expenditure and National Identity





Social Welfare spending is total social expenditure as percentage of GDP, from OECD (2004), Social Expenditure database (SOCX), 1980-2001. National identity scale is from ISSP 1995 (see text for details). Fraction very proud is from WVS waves 1-3. Figures exclude Eastern Europe.