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ABSTRACT

We study the correlation between a belief concerning individualism and a measure of luck in the US during the period 1983-2004. The measure of beliefs is the answer to a question related to whether the poor should be helped by the government or if they should help themselves, while the measure of luck is the share of the oil industry in the state's economy multiplied by the price of oil. The correlation is negative, suggesting that more reliance on luck is correlated with less individualism. We provide three short models that help interpret this correlation. One implication of this finding is that societies that depend heavily on oil, and perhaps natural resources more generally, will experience a heavier demand for government intervention. We argue that if a government cares about the impact of its natural resource policies on the demand of government intervention more generally, it should take this effect into account.

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1 Introduction

> Like all the men of Babylon, I have been proconsul; like all, I have been a slave. I have known omnipotence, ignominy, imprisonment. (...).
>
> I owe that almost monstrous variety to an institution–the Lottery– which is unknown in other nations, (...).
>
> A slave stole a crimson ticket; the drawing determined that that ticket entitled the bearer to have his tongue burned out. The code of law provided the same sentence for stealing a lottery ticket. Some Babylonians argued that the slave deserved the burning iron for being a thief, others, more magnanimous, that the executioner should employ the iron because thus fate had decreed. There were disturbances, there were regrettable instances of bloodshed, but the masses of Babylon at last, over the opposition of the well-to-do, imposed their will; they saw their generous objectives fully achieved.
>
> Excerpts from "The Lottery in Babylon", by Jorge Luis Borges, 1941.

Markets, privatizations and other capitalist ideas do not seem to be appreciated by the public at large. Outside the US, and a few countries where communism made people's life really miserable, capitalism, at least without strong regulations, is not in high demand around the world. Several survey measures attest to this. For example, a 2005 survey in 20 countries showed that 65% of respondents endorsed the view that *"The free enterprise system and free market economy work best in society's interests when accompanied by strong government regulations."* Beyond opinions, data on the platforms and names of political parties reveal that left wing parties are more common in poor countries than in rich countries. Figure 1 illustrates the typical pattern.[1] This is unfortunate for economists because our own enthusiasm for markets relies on the assumption that people are rational. Thus, explaining the public's antipathy towards our preferred solution to the world's material problems appears to be of importance to Economics.

Figure 1 about here

Beyond this general point, antipathy towards markets has become particularly acute in Latin America, where a series of "surprise right wing reformists" had emerged during the 1990's.[2] Of course, the left wing wave eventually coincided with particularly high prices

[1] This is shown in Di Tella and MacCulloch (2002), using data on political parties from Beck et al (2000). Survey data comes the 2005 GlobeScan Report on Issues and Reputation accessed on October 27, 2007 through http://www.globescan.com/news_archives/pipa_market.html

[2] Interestingly, these surprise reforms where all cases of left or center politicians turned free marketers (including Menem in Argentina, Fujimori in Peru and Lula in Brazil). In contrast, in rich countries, there are more cases of surprises in the other direction (i.e., left wing actions by politicians elected on right wing platforms), including the case of "Nixon going to China". See Lora and Olivera (2006) and Queirolo (2006) for the electoral fate of the reformers.

for oil and primary commodities after the year 2000. In Bolivia, Venezuela, Ecuador and Argentina, policymakers have focused their anti market energies and attention on natural resource companies, renegotiating their contracts in several cases. Accordingly, a more specific question for economists concerns the possible connection between natural resource dependence and ideological inclination. Believers in the advantages of free markets for economic development might be inclined to ask the question differently, namely "Is the curse of the "resource curse" a tendency for people to become left wing when natural resources are important in the economy?"

A basic explanation for the general phenomenon is provided in a seminal paper by Piketty (1995). He showed that beliefs concerning the income generating process could be central in determining the form of economic organization. In particular, he emphasized how rational agents would increase taxes when luck is important. In contrast, when effort plays a large role, rational agents fearing adverse incentive effects would moderate taxes. Interestingly, he argued that, even if there was one unique reality (given by the technology), a shock could make one belief particularly important at a point in time. If taxes had to be set at that moment, agents with different beliefs might not converge as long as it was difficult/costly to find credible information to generalize from their own experience. In fact, he argued that information on how much effort really pays is not easy to observe (given that effort input is not observable), and that eventually agents would settle on some belief about the likely value of these parameters and stop experimenting (a form of bandit problem). He emphasized that there are mechanisms that would reinforce these beliefs: where effort doesn't pay and luck dominates, agents would tend to vote on high taxes and luck would then really dominate. Other papers that give a central role to beliefs include Benabou and Ok (2001) on upward mobility, Alesina and Angeletos (2005) on fairness, Di Tella and Dubra (2008) on punitiveness, Benabou and Tirole (2006) on belief in a just world, and Alesina and Angeletos (2005) and Di Tella and MacCulloch (2002) on corruption. Denzau and North (1993) also give a central role to beliefs in their discussion of institutions as "shared mental models" (see also Greif, 1994).

In this paper we develop adaptations of these models predicting that oil dependence leads to beliefs and attitudes that lean towards the left end of the spectrum. We then present evidence of a negative correlation between individualist beliefs and oil dependence, using survey evidence from the US General Social Survey and the share of oil in a state's GDP for the period 1983-2004. The first theoretical mechanism delivering the correlation is quite simple: when the price of oil increases, people feel richer and want to increase the amount of money that they give to the poor people. We call this 'the charity model' and is related to (the spirit of) Meltzer and Richard (1981). In principle, a similar process might be affected by other primary commodities, so that one could "test" whether it is charity that drives the push to the left (or some other factor which is specific to oil) by looking at the effect of other commodity prices and establishing whether they have the same effect as

oil.[3] However, it is perhaps significant that oil is visible in political debates and occupies a place of some importance in popular imagination (affecting for example, the perception of whether individuals are living in a rich country), so the dynamics affecting oil might be different than those affecting other commodities.

The second model introduces an important cost of these redistributions, namely that higher taxes reduce the amount of effort that agents put forth, as argued in Piketty (1995). The basic assumption is that the effort elasticity of income in the oil sector is smaller (or is perceived to be smaller) than in the non-oil sector. We model this by assuming that the elasticity in the oil industry is actually zero, which leads to the extreme result that full nationalization of the oil industry is good for the economy because it leads to lower taxes in the rest of the economy, and to lower distortions overall. Trivially, in more sophisticated settings, where oil companies have to invest heavily to maintain production, this result changes. But the model raises an important issue, namely that as long as the voters have the perception of oil industries effortlessly extracting a natural resource, the demand for taxes and state intervention in the sector will be high.[4] This reasoning also applies to exogenous increases in the price of oil. Presumably, exogenous movements in the price of oil redistribute income and reduce people's faith in their estimate of the effort elasticity of income (these movements will increase the standard error of their estimates of how income responds to effort). Note that, to the extent that the oil industry is owned by (and affects) actors outside the state, changes in employment in the oil industry observable within the state are particularly relevant. A related point is that in an economy where oil is an important export, changes in the price of oil lead to changes in capital inflows and macroeconomic volatility more generally. Again, if income in the economy behaves like earnings in a casino, it will be hard for voters to be convinced of the idea that one has to be careful about raising taxes because it might affect effort (and income).

The third model we present is built around the idea that oil dependence may affect the perception of fairness in the economy. This matters in the model of Alesina and Angeletos (2005) which gives a central role to an individual's perception of fairness in the economy, although the version we use here is heavily modified. This perception is increased when people are seen to "get what they deserve and deserve what they get". Accordingly, they focus on how talent and effort affect income relative to random shocks. We adopt a similar assumption concerning how unfairness reduces utility, and assume income in the oil sector is particularly noisy, leading to an increased perception of unfairness in the economy. By increasing taxes when oil prices are high, voters are able to reduce the amount of undeserved (as talent and effort play a small role) income amongst the rich. Again, directing the taxes

[3] If the "profits" generated by other commodities depend more on effort than do the profits of oil, a rise in the price of these commoditied might lead to less effort, however.

[4] There is evidence that expropriation rhetoric pays attention to this aspect. For example, Venezuelan president Hugo Chavez announced in 2005 a plan to expropriate approximately 1,800 enterprises that were deemed unproductive. See, for example, "Otro Controvertido Plan del Gobierno de Chavez", *La Nacion*, Martes 19 de Julio de 2005.

to the oil sector would improve the efficiency (and fairness) in the economy, although in circumstances that high oil prices bring about capital inflows, such ability to target taxes to particular sectors might be of limited use.

Finally, it is worth mentioning that oil dependence is positively correlated with perceptions of corruption within countries. Corruption is correlated with a desire for higher taxes, both generally, in the fairness models of Alesina and Angeletos (2005), and specifically as it relates to how the income of capitalists is derived, in the model of commercial legitimacy of Di Tella and MacCulloch (2002). More broadly, the idea that beliefs, in particular beliefs about the income generating process, play an important role in the determination of the economic system goes back at least to de Tocqueville's work emphasizing economic opportunities and status as derived from material position and Frederick Jackson Turner's work on the 'The Frontier' in American History and its significance for the determination of American culture in cities far away form the frontier itself. Later work, particularly by Seymour Martin Lipset, emphasized the role of beliefs about mobility independent of the amount of mobility itself. Evidence on the patterns of beliefs has been gathered by Hochschild (1981), Inglehart (1990), Ladd and Bowman (1998), Hall and Soskice (2001), Corneo and Gruner (2002), Fong (2004), Di Tella, *et al* (2007), inter alia. Closer to the question we ask, concerning the statistical correlation between beliefs and oil, is the more recent work by Alesina and Glaeser (2004) who find left wing views to prevail in countries small in size or with electoral systems based on proportional representation, and the papers by Di Tella *et al* (2006) (on the correlation between beliefs and oil dependence, macroeconomic volatility and crime) and Giuliano and Spilimbergo (2007) (on the effects of growing up in a recession on your beliefs). As a reference, we present in Figure 2 the results from Di Tella *et al* (2006).

Figure 2 about here

The figure shows that average right(left) self placement in the country is negatively correlated with Fuel Exports ('Fuel exports as % of merchandise exports') and Ores ('Ores and metals exports as % of merchandise exports'), controlling for country and year fixed effects in a sample of 49 countries included in the World Values Survey. For illustration purposes, we re-run the the base regression with Fuel Exports as the independent variable using a probit, and set the other variables at their average level, forcing the data so that there is an even split of beliefs when Fuel Exports are equal to zero. When Fuel Exports increase to 10%, self-placement on the left exceeds that on the right by 6 percentage points (i.e., 53% to 47%). We also show increases in Fuel Exports of up to 90% as, in our sample, the Fuel Exports in Nigeria in 1997 are 96%.

In the next section we discuss the three short models that help us interpret the relationship between oil dependence and beliefs. In the third section we present evidence on this correlation using panel data for the US for the period 1983-2004. Section IV concludes.

2 Three Models Connecting Oil and Beliefs

2.1 Charity

We start exploring a simple mechanism directly connecting income and beliefs (or more generally, ideology). The literature starting with Meltzer and Richard (1981) has emphasized the role of material gains from redistribution in more unequal societies (in terms of income). In particular, income inequality has a big role to play because the median voter has more to gain from taxing citizens that are farther away in terms of income. A problem with this approach is that it is well known that this mechanism fails to explain even the basic properties of cross country data. For example, the US is more unequal than France and it seeks to redistribute less (instead of more). Still, the natural reaction when faced with governments that re-contract when the price of oil goes up is related to material incentives: these governments are taking advantage of the good times to get a bigger piece of the pie for themselves. The "charity model" presented here also gives a central role to increases in income as it makes people more willing to help others.[5] The connection with "helping others" follows the empirical evidence that we have available on why and how people give to charity, or help in the charitable provision of public goods (see Morgan, 2000, and the references therein). In brief, the section seeks to illustrate why might a higher oil price increase the desire to help the poor, through an income effect. The intuition is simple enough: concavity of the utility function implies that a given transfer costs less in utils for a richer person.

There are two people in the state, the representative worker and the "poor guy". Output in the manufacturing industry is fixed at m, and nominal output in the oil industry is $p.q$. All the output (which equals profits) is owned by the worker, who is taxed an amount t, and the receipts of the tax are transferred to the poor guy. The utility of the poor guy is $v(t)$ and that of the representative worker is $u(pq+m-t)+v(t)$ (he cares about the poor guy).[6]

Proposition 1 *If $u'' \leq 0$, the optimal tax is increasing in the price of oil.*

Proof. We use monotone comparative statics (see Milgrom and Shannon, 1994). It is easy to see that since the choice variable t is one dimensional, the utility function of the worker is quasisupermodular in t. It will therefore suffice to show that it satisfies the single crossing property: for $p' > p$ and $t' > t$,

$$\begin{aligned} u(pq+m-t')+v(t') &\geq u(pq+m-t)+v(t) \\ &\Rightarrow u(p'q+m-t')+v(t') \geq u(p'q+m-t)+v(t) \end{aligned}$$

[5] We assume altruistic preferences, whereas Meltzer and Richard (1981) assume agents that care only about their own material payoffs. Strangely enough, altruism is relatively uncommon in the political economy literature as a motivation. But see Rotemberg (2003).

[6] It is possible to write this model with standard selfish preferences by assuming that one decides on taxes before the revelation of income.

(and similarly with strict inequalities). The idea is that if the worker prefers raising taxes for a low price, he also prefers so for a high price. Rearranging terms, the above condition is equivalent to

$$\begin{aligned} u(pq+m-t')-u(pq+m-t) &\geq v(t)-v(t') \\ &\Rightarrow u(p'q+m-t')-u(p'q+m-t)\geq v(t)-v(t'). \end{aligned}$$

So it is enough that

$$u(p'q+m-t')-u(p'q+m-t)\geq u(pq+m-t')-u(pq+m-t)$$

which is ensured if u is concave (note that in this case, u being concave is not a "cardinal" property, because the worker's utility is $u+v$, so one can't transform u "at will" as would be the case if v wasn't there). To see so, note that $u''\leq 0$ implies that for all $s\in[t,t']$, $u'(p'q+m-s)\leq u'(pq+m-s)$ which implies

$$\begin{aligned} \int_t^{t'} u'(p'q+m-s)\,ds &\leq \int_t^{t'} u'(pq+m-s)\,ds \Leftrightarrow \\ u(p'q+m-t')-u(p'q+m-t) &\geq u(pq+m-t')-u(pq+m-t) \end{aligned}$$

as was to be shown. ■

Notice that the intuition for the result corresponds exactly with the statement of the proposition: if u is concave, a given transfer costs less in utils for a richer person. If we used more "traditional" methods, however, we would also have to assume that $v''\leq 0$. With traditional methods, the first order condition for the optimal tax is $u'(pq+m-t(p))=v'(t(p))$, so that

$$u''(pq+m-t(p))(qdp-t'dp)=v''(t(p))\,t'dp \Leftrightarrow t'=\frac{u''(pq+m-t(p))\,q}{u''(pq+m-t(p))+v''(t(p))}.$$

If $v''\leq 0$ and $u''\leq 0$, we obtain $t'\geq 0$ (but note that we need more conditions, not just $u''\leq 0$).

Finally, we note that the roles of p and q are symmetric in the utility function of the worker. Therefore, optimal taxes would also increase after an increase in q. We don't push this point further, because in this simplified model we have assumed that there is no cost to extracting output in the oil industry. In a richer model that incorporates the realistic assumption that extracting oil has a cost, the roles of p and q wouldn't be symmetric any more, and an increase in output wouldn't lead necessarily to an increase in taxes. In addition, here p and q are taken as given, but in a richer model, p would be exogenous, while q would be a choice variable.

2.2 Efficiency

The features discussed in this model follow Piketty's discussion in the context of alternative economic systems, but it is a general approach that goes back to Ramsey (1927) and his

insights about the relationship between elasticities and taxes.[7] The basic idea that drives our results in this section, is that output in the oil industry, being driven primarily by luck and not effort, is less sensitive to taxes than output in the manufacturing industry. Hence, efficiency dictates that taxes in the oil industry should be larger. This translates into two different effects. First, if taxes are uniform across industries, the tax rate in a society will be higher the higher the share of oil in GDP. Second, if tax rates are allowed to vary across industries, a nationalization (expropriation) of the oil industry may be optimal.

There are two sectors in the economy, the *O*il industry and the *M*anufacturing industry, and time is discrete $t = 0, 1, 2....$

1. At the start of each period the tax rate for the period and the proportion of people earning income from the oil industry are fixed.

2. Then, people in the manufacturing industry choose effort, and incomes are realized: pre-tax incomes can be either y_0 or $y_1 > y_0 > 0$; in the oil industry, the probability of y_1 is a fixed exogenous π, whereas in the manufacturing industry the probability of y_1 is e, the worker's effort.

3. After the choices of effort, and the realization of the income shocks, nature chooses for the next period (through its choice of the price of oil) whether the proportion of people in the economy earning income from the oil industry is q_l or $q_h > q_l$ (higher price leads to more investment and more hiring by the oil firms).

4. A tax rate that maximizes the income of (next period's) poor workers is set[8]

The worker's utility when income is y and effort e is

$$U = y - \frac{e^2}{2a}$$

(where $a > 0$ is a parameter such that $a(y_1 - y_0) \in [0, 1]$). We also add the restriction that the oil sector is not too large in the economy to ensure that the optimal tax rate is not full expropriation: $a(y_1 - y_0) \geq \pi q/(1 - q)$ for all q (we have assumed that there are only two levels of q, but the model can be immediately generalized to an arbitrary set of qs in $\mathbf{R}$).

Income is taxed at a rate τ and tax revenue is redistributed in a lump-sum way to all workers, so that if total income is Y, after tax income is either $(1 - \tau) y_0 + \tau Y$ or $(1 - \tau) y_1 +$

[7] In the first version of this paper we incorrectly claimed that the approach originated in Piketty (1995). We thank George Marios Angeletos for pointing this out and other useful comments.

[8] Why focus on income and not utility? There are at least two reasons for this choice. First, utility is unobservable, while income may be observed (possibly imperfectly). Second, in this model utility is different depending on the sector (workers in one sector exert effort, while in the other they do not). Therefore, while the simplification of oil's production being just luck and manufacturing's probability of high output just effort is good for highlighting our point, it would be incorrect to make it play an additional role (as it would do if we considered the cost of effort in the maximization).

τY. When choosing his effort level, the worker takes Y as given (there are a continuum many workers), so that his effort is

$$\begin{aligned} e(\tau) &= \arg\max_e e\left[(1-\tau)y_1 + \tau Y\right] + (1-e)\left[(1-\tau)y_0 + \tau Y\right] - \frac{e^2}{2a} \\ &= \arg\max_e e(1-\tau)(y_1 - y_0) - \frac{e^2}{2a} = a(y_1 - y_0)(1-\tau) \end{aligned} \tag{1}$$

By our assumption that $a(y_1 - y_0) \in [0,1]$, the optimal effort also does, and hence the probability of the high income in the manufacturing industry (which is exactly e) is also between 0 and 1.

Then, the income of the poor workers in the next period (if today a tax rate of τ is chosen for tomorrow and a proportion q of the population will be in the oil industry) is

$$(1-\tau)y_0 + \tau\left\{q\left[\pi y_1 + (1-\pi)y_0\right] + (1-q)\left[e(\tau)y_1 + (1-e(\tau))y_0\right]\right\}$$

which, after simplification becomes

$$y_0 + (y_1 - y_0)\tau\left\{q\pi + (1-q)e(\tau)\right\}. \tag{2}$$

Note first that the poor worker's income is his production, y_0, plus a proportion τ of the incremental income of the rich, $y_1 - y_0$, multiplied by the proportion of rich people $\{q\pi + (1-q)e(\tau)\}$. Of course, if the effort were fixed at e^*, the optimal τ would be 1, since $q\pi + (1-q)e^* > 0$ (it would be optimal to completely equalize incomes). But since taxing reduces effort, such a high tax rate is not optimal because eventually it becomes counterproductive.

Proposition 2 *The optimal tax rate is*

$$\tau = \frac{a(y_1 - y_0) + \pi\frac{q}{1-q}}{2a(y_1 - y_0)} \tag{3}$$

which is increasing in q.

Proof. Substituting the expression of the optimal effort rate $e(\tau) = a(y_1 - y_0)(1-\tau)$ into equation (2) we obtain the objective function to be maximized

$$y_0 + (y_1 - y_0)\tau\left\{q\pi + (1-q)e(\tau)\right\} = y_0 + (y_1 - y_0)\tau\left\{q\pi + (1-q)a(y_1 - y_0)(1-\tau)\right\}$$

that is maximized for the tax rate in equation (3). Also, we note that the expression for the optimal tax rate is increasing in q, and that the tax rate is between 0 and 1, because of our assumption that $a(y_1 - y_0) \geq \pi q/(1-q)$. ■

The previous Proposition can be interpreted more generally in the context of "the curse of natural resources": if a country's income relies heavily on activities in which taxes are not "very" distortionary, taxes will tend to be higher. Note that the problem arises because

the same tax is applied to all sectors. If the tax to the two sectors could be different, the oil sector would be taxed at 100% rate (as there is no effort cost, and no inefficiency associated with the tax), providing a rationale for nationalizations. Thus, it is best for the rest of the capitalists (and the economy) to nationalize the oil industry. This result is presented in the next Proposition, but before we continue, a word about what it means to nationalize an industry is in order. Our "operational" definition of a nationalization, is that all oil-workers' income is equated to the income of the poor workers in the manufacturing industries; all income in excess of that of poor workers in other sectors is expropriated. Formally, after a nationalization, the poor workers' income (irrespective of the sector) is the sum of their post tax income, plus the government transfers arising from the oil industry, plus the transfers arising from the manufacturing sector:

$$(1-\tau)\,y_0 + q\left(\pi\left(y_1 - (1-\tau)\,y_0\right) + (1-\pi)\,\tau y_0\right) + \tau\,(1-q)\left(ey_1 + (1-e)\,y_0\right). \qquad (4)$$

With other (reasonable) definitions of a nationalization, the result that taxes are lower after a nationalization continues to hold. The reason is simple: after the nationalization, the tax rate is applied only to sectors where the taxes are distortionary, while before the nationalization it applied also to the oil sector where no distortions would arise; taxes are relatively more distortionary after the nationalization.

Proposition 3 *The optimal tax rate falls after a nationalization of the oil industry.*

Proof. After a nationalization, the income of the poor workers is as in equation (4), that simplifies to $y_0 + (\pi q + \tau e\,(1-q))\,(y_1 - y_0)$. Substituting the optimal effort from equation (1), we obtain the expression to be maximized:

$$y_0 + (\pi q + \tau a\,(y_1 - y_0)\,(1-\tau)\,(1-q))\,(y_1 - y_0)$$

This expression is maximized for $\tau = 1/2$, which is smaller than the tax rate (3) before the nationalization, as was to be shown. ■

As argued above, since Proposition 3 shows that taxes would fall in the rest of the economy after a nationalization of the oil industry, it provides a political economy argument in favor of nationalizations. Also, it is easy to show that the distortions introduced by taxation are smaller after the nationalization. Therefore, there is also an efficiency rationale for nationalizing the oil industry (assuming that output in the industry wouldn't fall if the sector is managed by the government).

2.3 Fairness: Adapting Alesina-Angeletos

An alternative channel through which oil might influence the desire to distribute income is by its effect on the perception of the degree to which people live in a fair society. A natural

question is how is fairness going to be defined?[9] We follow the idea that people can feel disutility when they find out that they live in a society where people consume more than what they "deserve", where this is the amount that their effort and talent would command. This is broadly the approach followed in Alesina and Angeletos (2005) (henceforth AA), although our specification has several differences (see below for a detailed discussion).[10]

Finally, it is worth pointing out that in the present definition of fairness, oil dependency increases the perception that unfairness prevails because it generates income that is not tied to effort or talent. As explained above, we do not have evidence concerning this assumption (i.e., we do not have evidence that there is such a widespread perception that effort plays such a small role in the extraction of oil, or, more precisely, that the effort elasticity of production in the oil sector is smaller than in manufacturing). Again, we view this as a broad issue, where the discovery of oil (or an increase in its price) may lead to an increase in capital inflows and changes in relative prices (in particular in the exchange rate), that can be seen as unexpected and tied to luck.

There are two sectors in the economy, the Oil industry and the Manufacturing industry, and time is discrete $t = 0, 1, 2....$

1. At the start of each period the proportion of people earning income from the oil industry is fixed (by nature) and known. Nature then chooses two shocks for each individual: an ability shock, and a luck shock. The latter is identically 0 for the manufacturing industry.

2. Taxes are set by majority voting.

3. Then, people choose effort.

4. After the choices of effort, nature chooses for the next period whether the proportion of people in the economy earning income from the oil industry is q_l or $q_h > q_l$. This is a reduced form formulation for a broader model in which nature chooses demands or tastes in the economy that induce variations in the price of oil; then if, for example, nature chose a high price, that would lead to more investment and more hiring by the oil firms.

The economy is populated by a measure 1 continuum of individuals $i \in [0, 1]$. For each individual i, and industry $j = O, M$, total pre-tax income y_i is

$$y_i = A_i e_i + \eta_i^j$$

[9] Another question is why would oil dependence make society more unfair? We continue to maintain our assumption of the previous model, that output in the oil industry is more connected to luck than output in the rest of the economy. Hence, in a broad sense, the models in this section and in the previous section can be seen as having the same underlying structure on the firms' side; but higher taxes arise for efficiency reasons in the previous model, and for fairness reasons in this model.

[10] We note that reasonable alternatives to the definition of what is fair and what is not include Levine (2001) and Rotemberg (2003), who focus on reciprocal altruism; Di Tella and MacCulloch (2002) use these preferences to analyze why capitalism does not flow to countries where capitalists are perceived to be corrupt.

where A is talent, e is effort and η_i^j is "noise" or "luck" for individual i in industry j. We assume that η^O has 0 mean, and a symmetric distribution, that η^M is always 0, and that the distribution of A^2 is symmetric (we also assume that $2A^2$ is greater than the maximum element in the support of A_i^2). The shocks A and η are independent among them, and across agents.

The government imposes a flat tax rate τ on income and redistributes the proceeds in a lump sum fashion, so that the individual's consumption is

$$c_i = (1-\tau)\, y_i + G$$

for government transfer $G = \tau \int_i y_i$.

Let u_i be the private utility from own consumption and effort; γ the "distaste for unfair outcomes"; and Ω a measure of the social injustice in the economy. Then, with $u_i = V(c_i, e_i) = c_i - e_i^2/2$ being the private utility of consumption and effort, individual preferences are

$$U_i \equiv u_i - \gamma\Omega \equiv V(c_i, e_i) - \gamma\Omega \equiv c_i - \frac{e_i^2}{2} - \gamma\Omega.$$

Social injustice is

$$\Omega = \int_i (u_i - \widehat{u}_i)^2$$

where u_i is the actual level of private utility, and $\widehat{u}_i$ is a measure of the "fair" level of utility the individual should have (deserves) on the basis of his talent and effort. This follows Alesina and Angeletos (2005), who in turn follow a considerable literature in philosophy and morality on "just deserts". We note, however, that there are two differences between A and η. The first is that although one tends to view ability as a fairly permanent shock and luck as a transitory shock, in the model both are transitory shocks. Still, in our definition of unfairness (that follows Alesina and Angeletos'), we have assumed that people see a shock to talent as fair, and a luck shock as unfair; this assumption that a permanent shock is "fair" and a transitory one not, seems at odds with our perception of what people see as fair.

The second difference between A and η is that the ability shock A affects the agent's optimal choice of effort, while the luck shock doesn't. This second feature of our assumption of the interaction between shocks and effort is simply a reflection of how one usually thinks about talent and luck. Given the unobservable nature of "talent" and "luck", it would be impossible to gather evidence suggesting whether effort applied to the permanent shock has more impact on income than if applied to the temporary shock (in favor of our assumption, however, one can think of situations in which an individual with high talent could acquire education that affects the quality of the effort). We now define the fair level of utility $\widehat{u}_i$ as the level of utility an individual would have, if he consumed all his income, minus whatever income he gained from a luck shock: $\widehat{u}_i = V_i(\widetilde{c}_i, e_i) = \widetilde{c}_i - e_i^2/2$ for

$$\widetilde{c}_i = \widetilde{y}_i = (1-\tau)\, A_i e_i + G.$$

For the purposes of comparison, recall that individual consumption is $c_i = (1-\tau)\left(A_i e_i + \eta_i^j\right) + G$.

The individual maximizes

$$u_i = (1-\tau) A_i e_i + (1-\tau)\eta_i^j + G - \frac{e_i^2}{2} \tag{5}$$

with respect to e, to obtain $e_i = (1-\tau) A_i$. Let $\overline{\eta}$ be the mean and median of η, and let $a_i = A_i^2$ and $a_m = \int A_i^2$. Substituting into the utility, and using

$$G = \tau \int y_i = \tau \int A_i e_i + \eta_i^j = \tau(1-\tau)\int A_i^2 + \tau\overline{\eta} \equiv \tau(1-\tau) a_m + \tau\overline{\eta},$$

we get

$$\begin{aligned} u_i &= \frac{a_i}{2}\left(1-\tau^2\right) + \eta_i + \tau\left(\overline{\eta} - \eta_i\right) + \tau\left(a_m - a_i\right)(1-\tau) \\ &= \frac{a_i}{2}\left(1-\tau^2\right) + (1-\tau)\eta_i + \tau\left(a_m - a_i\right)(1-\tau) \end{aligned}$$

Using our definition of fair consumption, $\widetilde{c}_i = (1-\tau) A_i e_i + G$, we get

$$\begin{aligned} \Omega &= Var\left(c_i - \widetilde{c}_i\right) = Var\left((1-\tau) y_i - (1-\tau) A_i e_i\right) \\ &= Var\left((1-\tau)\left(y_i - A_i e_i\right)\right) = Var\left((1-\tau)\eta_i\right) \end{aligned}$$

But since only people in the oil industry have non-zero η_i shocks, and they are a proportion q of the population, letting σ_η^2 stand for the variance of η, social injustice is

$$\Omega = (1-\tau)^2 q\sigma_\eta^2.$$

Then, $U_i = u_i - \gamma\Omega$ implies

$$\begin{aligned} U_i &= \frac{a_i}{2}\left(1-\tau^2\right) + (1-\tau)\eta_i + \tau\left(a_m - a_i\right)(1-\tau) - \gamma\Omega \\ &= \frac{a_i}{2}\left(1-\tau^2\right) + (1-\tau)\eta_i + \tau\left(a_m - a_i\right)(1-\tau) - \gamma(1-\tau)^2 q\sigma_\eta^2 \end{aligned} \tag{6}$$

The next theorem identifies who is the median voter, in terms of the underlying shocks: given our symmetry assumptions, the individual whose preferred tax rate is the median of the distribution of preferred tax rates, is the individual with the median values of the shocks a and η.

Theorem 1 *The Median Voter is the individual with the median values of the shocks. That is, the tax rate preferred by the individual with the median values of the shocks,* $(a_i, \eta_i) = (a_m, 0)$, *is a Condorcet winner: it beats every other tax rate by simple majority voting.*

Proof. From the equation (6) we obtain

$$\frac{dU_i}{d\tau} = -a_i\tau - \eta_i + \left(a_m - a_i\right)(1-2\tau) + 2\gamma(1-\tau) q\sigma_\eta^2$$

and then

$$\frac{d^2U_i}{d\tau^2} = a_i - 2a_m - 2\gamma q\sigma_\eta^2.$$

The optimal tax rate for an individual with shocks (a_i, η_i) is determined by $\frac{dU_i(\tau^*)}{d\tau} = 0$ if $\tau^* \in (0,1)$:

$$\begin{aligned} \frac{dU_i}{d\tau} &= -a_i\tau - \eta_i + (a_m - a_i)(1-2\tau) + 2\gamma(1-\tau)q\sigma_\eta^2 = 0 \Leftrightarrow \\ \tau^* &= \frac{-\eta_i + a_m - a_i + 2\gamma q\sigma_\eta^2}{2a_m - a_i + 2\gamma q\sigma_\eta^2} \end{aligned}$$

If the numerator is negative, the optimal tax rate for the individual is 0, and if τ^* thus calculated is greater than 1, the optimal tax rate is 1.

To finish solving the model notice that we have assumed that $a_i - 2a_m \leq 0$ for all a_i in the support, so that $d^2U_i/d\tau^2 < 0$ and preferences are single peaked; then the median voter theorem applies. We now show that the median voter (the individual whose preferred tax rate accumulates 1/2 of the peaks to each side) is the individual who receives the median shocks $a_i = a_m$ and $\eta_i = 0$. Note that an individual's preferred tax rate is larger than the preferred tax rate of the voter with the median shocks iff

$$\frac{-\eta_i + a_m - a_i + 2\gamma q\sigma_\eta^2}{2a_m - a_i + 2\gamma q\sigma_\eta^2} \geq \frac{2\gamma q\sigma_\eta^2}{a_m + 2\gamma q\sigma_\eta^2} \Leftrightarrow \eta_i \leq \frac{a_m(a_m - a_i)}{a_m + 2q\gamma\sigma_\eta^2}.$$

Let f denote the density of a_i and g that of η. Recalling that a_m is the mean of a_i, we assume that for all x, $f(a_m - x) = f(a_m + x)$, and that $g(-x) = g(x)$. With this assumption, a_m is not only the mean of a_i but also its median. Let

$$S = \left\{ (a_i, \eta_i) : \eta_i \leq \frac{a_m(a_m - a_i)}{a_m + 2q\gamma\sigma_\eta^2} \right\}$$

so that the proof will be complete if we show that $\Pr(S) \geq 1/2$.

We have that for $c \equiv a_m / \left(a_m + 2q\gamma\sigma_\eta^2\right)$

$$\begin{aligned} \Pr\{S\} &= \int_{-\infty}^{\infty} \left[\int_{-\infty}^{(a_m - a_i)c} g(\eta)\, d\eta \right] f(a)\, da \qquad (7) \\ &= \int_{-\infty}^{a} \left[\int_{-\infty}^{(a_m - a_i)c} g(\eta)\, d\eta \right] f(a)\, da + \int_{a}^{\infty} \left[\int_{-\infty}^{(a_m - a_i)c} g(\eta)\, d\eta \right] f(a)\, da \end{aligned}$$

Define $z(a) = a - a_m$, the density h of z is such that $h(z) = f(z + a_m)$, so that by the symmetry assumption on f, we have $h(z) = f(z + a_m) = f(a_m - z) = h(-z)$. Then, equation (7) and the change of variable $z(a) = a - a_m$ imply that

$$\Pr\{S\} = \int_{-\infty}^{0} \left[\int_{-\infty}^{-zc} g(\eta)\, d\eta \right] h(z)\, dz + \int_{0}^{\infty} \left[\int_{-\infty}^{-zc} g(\eta)\, d\eta \right] h(z)\, dz \qquad (8)$$

but symmetry of g implies that

$$\int_{-\infty}^{-zc} g(\eta)\, d\eta = \int_{zc}^{\infty} g(\eta)\, d\eta$$

so that equation (8) becomes

$$\Pr\{S\} = \int_{-\infty}^{0}\left[\int_{-\infty}^{-zc} g(\eta)\,d\eta\right] h(z)\,dz + \int_{0}^{\infty}\left[\int_{zc}^{\infty} g(\eta)\,d\eta\right] h(z)\,dz$$

Since g is symmetric, the pdf of g, G, is such that for all x, $G(-x) = 1 - G(x)$. Therefore

$$\begin{aligned}\Pr\{S\} &= \int_{-\infty}^{0} G(-zc)\,h(z)\,dz + \int_{0}^{\infty}[1 - G(zc)]\,h(z)\,dz \\ &= \int_{-\infty}^{0}[1 - G(zc)]\,h(z)\,dz + \int_{0}^{\infty}[1 - G(zc)]\,h(z)\,dz\end{aligned}$$

so for $w = -z$, using $h(-w) = h(w)$ and $1 - G(-wc) = G(wc)$ we obtain

$$\begin{aligned}\Pr\{S\} &= \int_{-\infty}^{0}[1 - G(zc)]\,h(z)\,dz + \int_{0}^{\infty}[1 - G(zc)]\,h(z)\,dz \\ &= \int_{0}^{\infty}[1 - G(-wc)]\,h(w)\,dw + \int_{0}^{\infty}[1 - G(zc)]\,h(z)\,dz \\ &= \int_{0}^{\infty} G(wc)\,h(w)\,dw + \int_{0}^{\infty}[1 - G(zc)]\,h(z)\,dz = \int_{0}^{\infty} h(z)\,dz = \frac{1}{2}.\end{aligned}$$

This completes the proof. ■

The previous Theorem establishes whose preferences will prevail. The next result is the main result of this section: it characterizes the tax rate preferred by the median voter; it establishes the equilibrium tax rate, and indicates the comparative statics of the equilibrium tax rate with respect to how important is oil in the economy. The Theorem shows that as the oil industry becomes more important in a society, its tax rate will increase.

Theorem 2 *The Condorcet winner, the equilibrium tax rate, is*

$$\tau^* = \frac{2\gamma q\sigma_\eta^2}{a_m + 2\gamma q\sigma_\eta^2} \tag{9}$$

so that an increase in q leads to an increase in the tax rate desired by society.

Proof. Substituting the median shocks in equation (6) and optimizing with respect to τ, we obtain the tax rate preferred by the individual with median shocks given in equation (9). Theorem 1 then ensures that this is the tax rate adopted by society. ■

Our model is loosely based on Alesina and Angeletos'. Given the importance of that paper, in the next section we detail the differences between our model and theirs. In particular, the model of AA has a few mistakes some of which are important both for their paper and ours.

2.3.1 Differences with Alesina and Angeletos

A first small difference here is that we corrected some small algebraic mistakes that lead AA to conclude that preferences are single peaked. Our assumption that $a_i - 2a_m \leq 0$ for all a_i in the support is necessary for single peakedness (see the proof of Theorem 1).

A second difference with AA is that even if one assumes that $a_i - 2a_m \leq 0$ for all a_i in the support, so that preferences are single peaked and the median voter theorem applies, their analysis of the equilibrium is problematic. In particular, they claim that the individual with the median values of the shocks is the median voter, which is not always true. As a consequence, they predict (for example) a 0 tax rate when the tax rate that arises in equilibrium (the Condorcet winner) is positive. In order to fix this problem in our model, we have made some symmetry assumptions on the distributions, that ensure that the individual with the median shocks is indeed the median voter.[11]

Finally, and most important, their definition of what constitutes a "fair level of consumption" is unattractive. Individual consumption is $c_i = (1-\tau)\left(A_i e_i + \eta_i^j\right) + G$; the AA definition of fair consumption (adapted to this model without capital) is $\widehat{c}_i = A_i e_i$, and our definition of fair consumption is $\widetilde{c}_i = (1-\tau) A_i e_i + G$. The "current" situation of the economy is $c_i = (1-\tau)\left(A_i e_i + \eta_i^j\right) + G$, so when asking ourselves "how would a fair society look like –what would life look like without luck shocks", it seems that the natural comparison is with $\widetilde{c}_i = (1-\tau) A_i e_i + G$ (the current situation, with luck shocks set to 0, but with taxes and government still in place). AA, however, define fair consumption to be one with 0 luck shocks, but also without government: $\tau = G = 0$. An important point to note is that while defining fair consumption as we do, or as AA do, has no relevant consequences for our model, it has critical consequences for AA: the multiplicity of equilibria disappears.[12] Also, this problem with the definition of fair consumption has the unnatural consequence that even if there is no unfairness in society ($\eta_i = 0$ for all i), changes in the preference for fairness (changes in γ) that should have no effect on the equilibrium tax rate (because there is no unfairness), *do* change the amount of redistribution that society wants. That is, the wedge between the "verbal" definition of fairness, and the technical one, affects the optimal tax for reasons unrelated to fairness.

3 Empirical Illustration Using US data

3.1 Data and Empirical Strategy

3.1.1 Data

We use two primary sources of data and discuss each one in turn. First, as we are trying to explain the determinants of a subjective preference (i.e., left versus right-wing) we need to acquire survey data on this attribute of an individual. The data we use for this purpose are repeated cross-sections of randomly sampled Americans from the United States General

[11] We note that the symmetry assumptions that ensure that the median voter is the voter with the median values of the shocks is not necessary to apply the median voter theorem, or the methods of Theorem 1. The model can be easily generalized to situations with asymmetric distributions of shocks.

[12] To obtain multiplicity again, one needs to make a very complicated definition Ω, the aggregate level of un-fairness in society.

Social Survey (GSS) from 1983 to 2004. The sample is reasonably continuous over time (although there are some holes -there are no GSS data for 1992, 1995, 1997, 1999 and 2001). There are however data for 1973 but they were discarded given that it is 10 years apart from the rest of our sample. Each survey is an independently drawn sample of English-speaking persons 18 years of age or over, living in the United States. One of the basic purposes of the GSS is to gather data on contemporary American society in order to monitor and explain trends and constants in attitudes, behaviors, and attributes.

The particular variable that we use from the GSS is called $Help\ Poor - R_{ist}$, which is a categorical variable that is the answer (by individual i, living in state s and year t) to the question:

> "Some people think that the government in Washington should do everything possible to improve the standard of living of all poor Americans; they are at Point 1 on this card. Other people think it is not the government's responsibility, and that each person should take care of himself; they are at Point 5. Where would you place yourself on this scale, or haven't you have made up your mind on this?". The possible answers are "1 (Gov't actions), 2, 3 (Agree with both), 4, 5 (People help selves)".

We assign the 'R' extension to the variable name since higher values of this variable are usually associated with the individualist response, which is sometimes associated with parties that are on the right of the political spectrum, related to how the poor themselves should be responsible for their own well-being (without government intervention).

Second, as a proxy for the relative role of luck versus effort in the determination of income we use $Luck_{st}$, which is defined as the price of oil (in US dollars) multiplied by the share of the oil industry in the total GDP of the State. States that are heavily dependent on oil revenues, and consequently the price of oil, are assumed to experience economic outcomes that are more determined by luck

3.1.2 Empirical Strategy

We estimate an ordered logit regression of the following form:

$$HelpPoor{-}R_{ist} = \alpha\ Luck_{st}{+}\beta\ Personalcontrols_{ist}{+}State_s{+}Year_t{+}StateTimeTrends_{st}{+}\varepsilon_{ist}$$

where the dependent variable, $HelpPoor - R_{ist}$, and our primary explanatory variable of interest, $Luck_{st}$, are both defined above. Note that exogeneity concerns should be mitigated due to the oil price (and relative size of the oil industry) being primarily determined by factors outside the control of individual preferences. $Personalcontrols_{ist}$ include the respondent's marital status, gender, income and age. Income is the response to the GSS question "In which of these groups did your total family income, from all sources, fall last year before

taxes, that is? Just tell me the letter". There are twelve possible categorical responses corresponding to different ranges of income, so we use dummy variables that correspond to each one of them.

All the regressions include state fixed effects, and we also report results that control for year fixed effects, $Year_t$, as well as state specific time trends, $StateTimeTrends_{st}$. The error term, ε_{ist}, is assumed to be logistic (and identically, independently distributed). For more information, see the appendix.

3.2 Results

Our main results are reported in Table 1. Column (1) reports the base specification in which the determinants of $HelpPoor - R$ are estimated. State dummies are included though there are no other controls. The negative sign is suggestive of a relationship whereby higher oil prices in States that are relatively dependent on oil drive people away from the right-wing and more towards the left-wing preference that the government should help the poor. As we argued above, this may be expected when people start believing that luck (not effort) plays an important role in the economy. In column (2) we add year dummy variables and obtain a similar result.

Table 1 about here

The third column also adds state specific time trends (in addition to state and year dummies). The negative effect of *Luck* on an individual's survey response of whether the poor should help themselves becomes significant at the 5 per cent level. In the base scenario, the cut points leave 16.0 % of the population in the bottom $HelpPoor - R$ category (i.e., Gov't actions), 13.4 % in the second to last, 45.7 % in the third, 14.6 % in the fourth and 10.3 % in the top category (i.e., People help selves). When *Luck* increases by an amount equivalent to a shift from a State that has no dependence on oil (e.g., Vermont) to the State with the highest dependence on oil in the sample (Wyoming) the median person has the same response to $HelpPoor - R$ as the person at the 36th percentile of the distribution in the base scenario. Figure 3 illustrates the alternative scenarios. That is, they become more supportive of government intervention to help the poor. This calculation assumes that the other explanatory variables are at their average levels in the sample. This does not seem like a very large effect. The exercise assumes a large change in oil dependence, which corresponds to an increase in *Luck* of $\$1,248$ (in constant 2000 dollars), when the standard deviation of *Luck* is \$ 117 (see Table A in Appendix A).

Figure 3 about here

In an attempt to provide another metric for these changes, we can focus on the top two categories of $HelpPoor - R$ (where people favor self-help for the poor). When *Luck* increases by an amount equivalent to a shift from (no-oil) Vermont to (oil-dependent) Wyoming, 8.9 percentage points of people no longer report themselves in one of the top two categories of

$HelpPoor - R$. That is, the proportion preferring the poor to bear responsibility for helping themselves drops from 24.9 % to 16.0 % as people lean more toward the view that the government should help. Alternatively, a one standard deviation increase in *Luck* leads 1.0 % of people to no longer report themselves in one of the top two categories of $HelpPoor - R$.

Similar results are obtained in column (4) once we add personal controls for each individual's marital status, gender, age and income level. As may be expected, whereas those on low incomes are strongly in favor of more government help for the poor, those on higher incomes are more disposed toward the view that the poor should look after themselves. The coefficients range from significantly negative in the low income categories to significantly positive in the top couple of categories. Older people are also in favor of the poor having to help themselves. The size of the effect of Luck on $HelpPoor - R$ becomes somewhat more negative with this full set of controls. Figure 4 provides an illustration of the results in this column, using an approach that can be compared with the country panel results in Di Tella *et al* (2006) presented in Figure 2. The size of the effects within the US are clearly smaller: In the present paper the exercise uses a much larger scale to display similar-sized effects, with a value of *Luck* of 1248 (as that is the value adopted in Wyoming in 1983).

Figure 4 about here

Robust regressions using the same specifications as above are done in Table 2. In the base specification in column (1), more *Luck* drives significantly less people to report that the poor should help themselves. The sign of the coefficient on *Luck* remains negative throughout all of the other specifications, though in contrast to Table 1, the effect loses significance in columns (2-3). In the most general specification reported in column (4), more *Luck* has a negative effect on $HelpPoor - R$ at the 5% level of significance, and its' size is not significantly different from the corresponding (non robust) coefficient reported in column (4) in Table 1.

Table 2 about here

One simple attempt to discriminate the charity channel versus the luck channel (for both the Piketty-based model of section 2.2 and the Alesina and Angeletos-based model of section 2.3) is to include income in the regression. Since the charity channel depends only on income, and not on luck specifically, if the luck coefficient continues to be significant, it suggests that there is a role for the belief based arguments in the models of Sections 2.2 and 2.3. The regression in column (4) does that by controlling for individual income. If oil affects beliefs through the charity mechanism, then any increase in income affects the desire to give to the poor because the concavity of the utility function implies that a given transfer costs less in utility for a richer person. An alternative to the same test is to include GDP per capita in the state at the same time as *Luck*. We do this in Tables 3 and 4.

Tables 3 and 4 around here

We find that GDP per capita does not have a robust correlation with $HelpPoor - R$, whereas *Luck* is still negative and, in the most complete specification which controls for personal characteristics and state specific time trends, also significant.

4 Conclusions

We start from the observation that capitalism is not as widespread as economists might hope. Data from surveys of public opinion, as well as on the distribution of political parties, confirm the idea that capitalism doesn't flow to poor countries. In some countries, anti market sentiment has increased in recent years, a period where the price of oil and other primary commodities have soared. The combination (of anti market sentiment and high oil prices) have led, not surprisingly, to renegotiations of oil contracts and even nationalizations in some countries such as Bolivia and Venezuela. Of course it is tempting for economists trained in the theory of political capture to argue that this is just another instance where special interests exploit the circumstances to make an extra dollar. Given that these nationalizations are often popular with the majority of voters, we resist this temptation and ask if there are explanations where a positive correlation emerges between voter's desired tax rates and dependence on oil.

We present three models where this association is natural. For example, in our adaptation of Alesina and Angeletos (2005), oil dependence increases the perception that luck rather than effort matters and high taxes are called in to increase "fairness". One implication is that non-oil sectors benefit from a nationalization of the oil industry because people's desired taxes go down. The link is based on the idea that the nationalization "removes" the sector where luck prevails from the determination of income in the country. Of course several assumptions are needed for this result. For example, the oil sector in the hands of the government will generate rents to some groups and this might undermine again the notion that effort pays, this time because connections and corruption drive income instead of effort. Thus, the results require that perceptions of corruption do not immediately become widespread (Di Tella and MacCulloch, 2002, present evidence that corruption perception leads to a desire to regulate).

We then present suggestive evidence for the period 1983-2004 from the US where answers to a question about whether the poor should be helped by the government (versus they should help themselves) tend less towards the individualist end of the spectrum when the share of the oil industry in a State increases. This holds in some specifications that control for income shocks. Thus, there seems to be at least some connection between dependence on oil and receptivity to populist rhetoric that is both natural in economic models and has some support in the data. Critics of left wing ideas might see this connection as another version of the "resource curse".

5 Appendix A

Survey Descriptions GSS 1972-2006 Cumulative Data File

The General Social Surveys (GSS) are designed as part of a program of social indicator research, replicating questionnaire items and wording in order to facilitate time-trend studies.

This collection is a cumulative dataset that merges all data collected as part of the General Social Surveys from 1972 to the present. Among the new items added for the 2002 surveys are topical modules on prejudice, doctors and patients, quality of working life, employee compensation, altruism, adult transitions, and mental health. Also included are crossnational modules, conducted under the aegis of the international Social Survey Program (ISSP), on the role of government, social support and equality, family and gender, national identity, religion, the environment, and work.

This cumulative data file merges all 25 General Social Surveys (1972-1978, 1980, 1982-91, 1993, 1994, 1996, 1998, 2000, 2002, 2004) into a single file with each year or survey acting as a subfile. This arrangement of the data facilitates trend analysis on repeated questions over the 32-year period. Each survey is an independently drawn sample of English-speaking persons 18 years of age or over, living in non-institutional arrangements within the United States. Block quota sampling was used in 1972, 1973, and 1974 surveys and for half of the 1975 and 1976 surveys. Full probability sampling was employed in half of the 1975 and 1976 surveys and the 1977, 1978, 1980, 1982-1991, 1993-1998, 2000, 2002, and 2004 surveys. The basic purposes of the GSS are to gather data on contemporary American society in order to monitor and explain trends and constants in attitudes, behaviors, and attributes; to examine the structure and functioning of society in general as well as the role played by relevant subgroups; to compare the United States to other societies in order to place American society in comparative perspective and develop cross-national models of human society. See http://www.disc.wisc.edu/newcatalog/study.asp?tid=13995&id=8093)

Individual Level Variables

Help Poor-R: is a categorical variable that is the answer to the question: "Some people think that the government in Washington should do everything possible to improve the standard of living of all poor Americans; they are at Point 1 on this card. Other people think it is not the government's responsibility, and that each person should take care of himself; they are at Point 5. Where would you place yourself on this scale, or haven't you have up your mind on this?". The possible answers are 1 (Govt actions), 2, 3 (Agree with both), 4, 5 (People help selves).

Luck(s,t): is computed as *Oil Price(t)*Oil Share(s,t)* where *Oil price(t)* denotes oil price at time t, *Oil Share(s,t)* refers to oil share in state, s, at time t and *Luck(s,t)* denotes luck in state, s, at time, t.

Age: Respondent's age in years.

Gender: Respondent's gender.

Marital Status: Respondent's marital status: Married, Widowed, Divorced, Separated, Never Married.

Income: is the answer to the question *"In which of these groups did your total family income, from all sources, fall last year before taxes, that is? Just tell me the letter"*. The possible answers are: 1 if *"LT $1000"*, 2 if *"$1000 to 2999"*, 3 if *"$3000 to 3999"*, 4 if *"$4000 to 4999"*, 5 if *"$5000 to 5999"*, 6 if *"$6000 to 6999"*, 7 if *"$7000 to 7999"*, 8 if *"$8000 to 9999"*, 9 if *"$10000 to 14999"*, 10 if *"$15000 to 19999"*, 11 if *"$20000 to 24999"*,

12 if *"$25000 or more"*, 13 if *"Refused"*. Refused values are treated as missing values in the regressions.

State Level Variables

Oil price(t): refers to Annual Average Crude Oil Price per Barrel (Real US$) and is obtained from U.S. Energy Administration.

Oil Share(s,t): refers to Oil Industry share as a % of GDP (US$ current) and is obtained from U.S. Bureau of Economic Analysis, www.bea.gov.

Table A about here

6 Appendix B

Notes to Tables 1 and 3

[1] All regressions are ordered logistic regressions. See also Notes to all tables. Cut points (standard errors) In Table 1: for col. (1) are: c1=-1.73 (0.10), c2=-0.95 (0.11), c3=1.02 (0.11), c4=2.07 (0.11). Cut points for col. (2): c1=-1.51 (0.12), c2=-0.73 (0.13), c3=1.24 (0.13), c4=2.29 (0.14). Cut points for col. (3): c1=-6.50 (0.39), c2=-5.72 (0.39), c3=-3.74 (0.39), c4=-2.68 (0.39). Cut points for col. (4): c1=-5.90 (0.47), c2=-5.09 (0.47), c3=-3.04 (0.46), c4=-1.97 (0.46).

Notes to Tables 2 and 4

[1] In all regressions we use the robust regression method using iteratively re-weighted least squares (Huber and Tukey biweights) with rreg routine in Stata. See Notes to all tables.

Notes to all Tables

[1] All regressions include states dummies. [2] Name of dependent variable has R (L) extension if higher numbers mean more Right (Left). [3] *Help Poor-R*: is a categorical variable that is the answer to the question: *"Some people think that the government in Washington should do everything possible to improve the standard of living of all poor Americans; they are at Point 1 on this card. Other people think it is not the government's responsibility, and that each person should take care of himself; they are at Point 5. Where would you place yourself on this scale, or haven't you have up your mind on this?"*. The possible answers are "1 (Govt actions), 2, 3 (Agree with both), 4, 5 (People help selves)". *Help Poor-R* is obtained from the GSS. [4] *Luck(s,t)=Oil Price(t)*Oil Share(s,t). Oil price* refers to Annual Average Crude Oil Price per Barrel (Real US$) and is obtained from U.S. Energy Administration. Oil Share refers to Oil Industry share as a % of GDP (US$ current) and is obtained from U.S. Bureau of Economic Analysis, www.bea.gov. [5] Personal Controls reported in column 4: marital status, gender, income and age. [6] Income is the answer to the GSS question *"In which of these groups did your total family income, from all sources, fall last year before taxes, that is? Just tell me the letter"*. The possible answers are: 1 if *"LT $1000"*, 2 if *"$1000 to 2999"*, 3 if *"$3000 to 3999"*, 4 if *"$4000 to 4999"*, 5 if *"$5000 to 5999"*, 6 if *"$6000 to 6999"*, 7 if *"$7000 to 7999"*, 8 if *"$8000 to 9999"*, 9 if *"$10000 to 14999"*, 10 if *"$15000 to*

19999", 11 if *"$20000 to 24999"*, 12 if *"$25000 or more"*, 13 if *"Refused"*. Refused values are treated as missing values in the regressions. [7] Standard errors (adjusted for clustering) in parentheses. [8] * significant at 10%; ** significant at 5%; *** significant at 1%.

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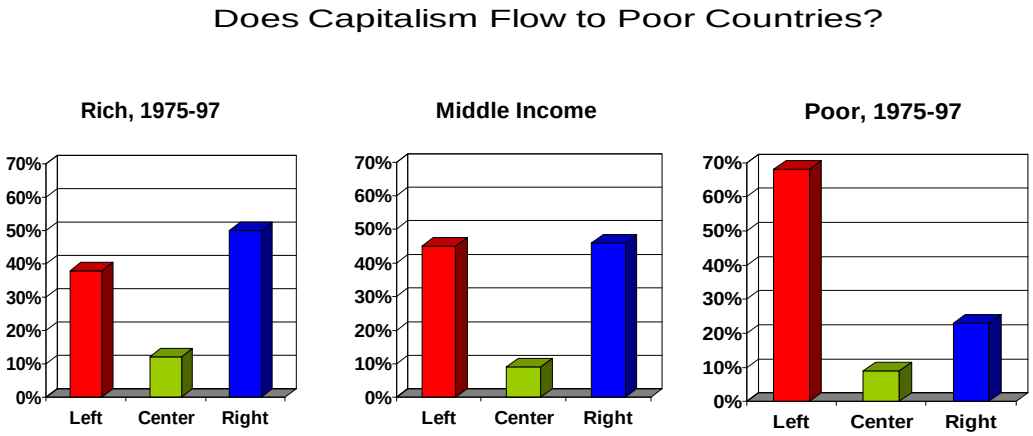

Figure 1: The distribution of party ideology around the world, 1975-97, by income.

Note: Source, Di Tella and MacCulloch (2002). Data on parties comes from Beck *et al* (2001) and refers to the color of the Chief Political Officer (prime minister of president). A similar picture emerges using largest government party. *Right:* Parties on the right are those with the terms "conservative" or "Christian democratic" in their names, or are labeled right-wing in their sources. *Left*: Similarly, parties classified as left if their names reveal them to be communist, socialist, or social democratic or if the sources label them as left-wing. *Center*: Similarly, centrist parties are those called centrist by their sources or if their proposed policies can best be described as centrist (e.g., because the party advocates strengthening private enterprise but also supports a redistributive role for government).

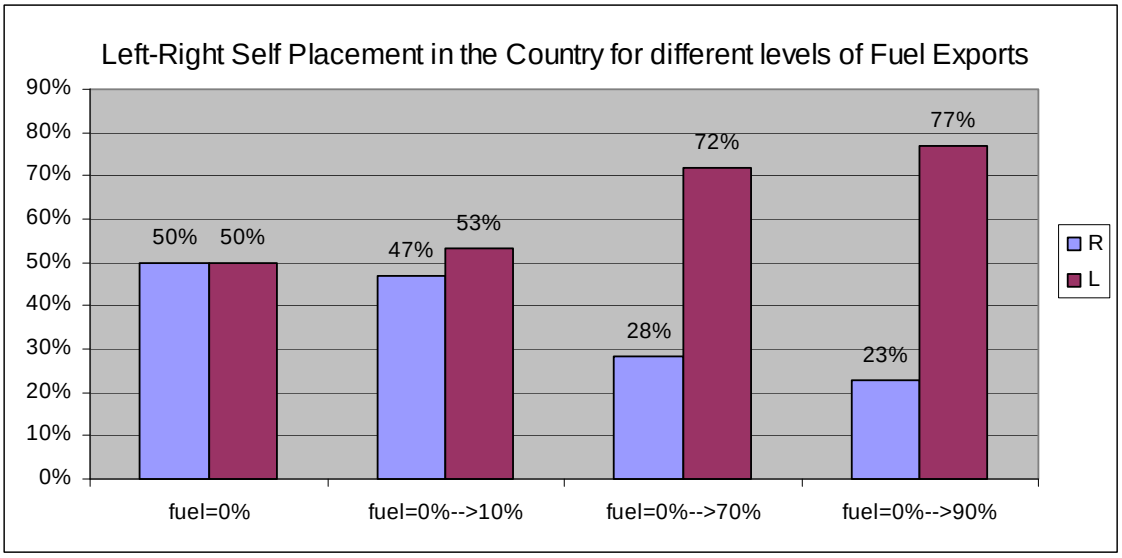

Figure 2: Average Left-Right Self Placement predicted in the Country for different levels of dependence on oil exports. Based on Di Tella et al (2006).

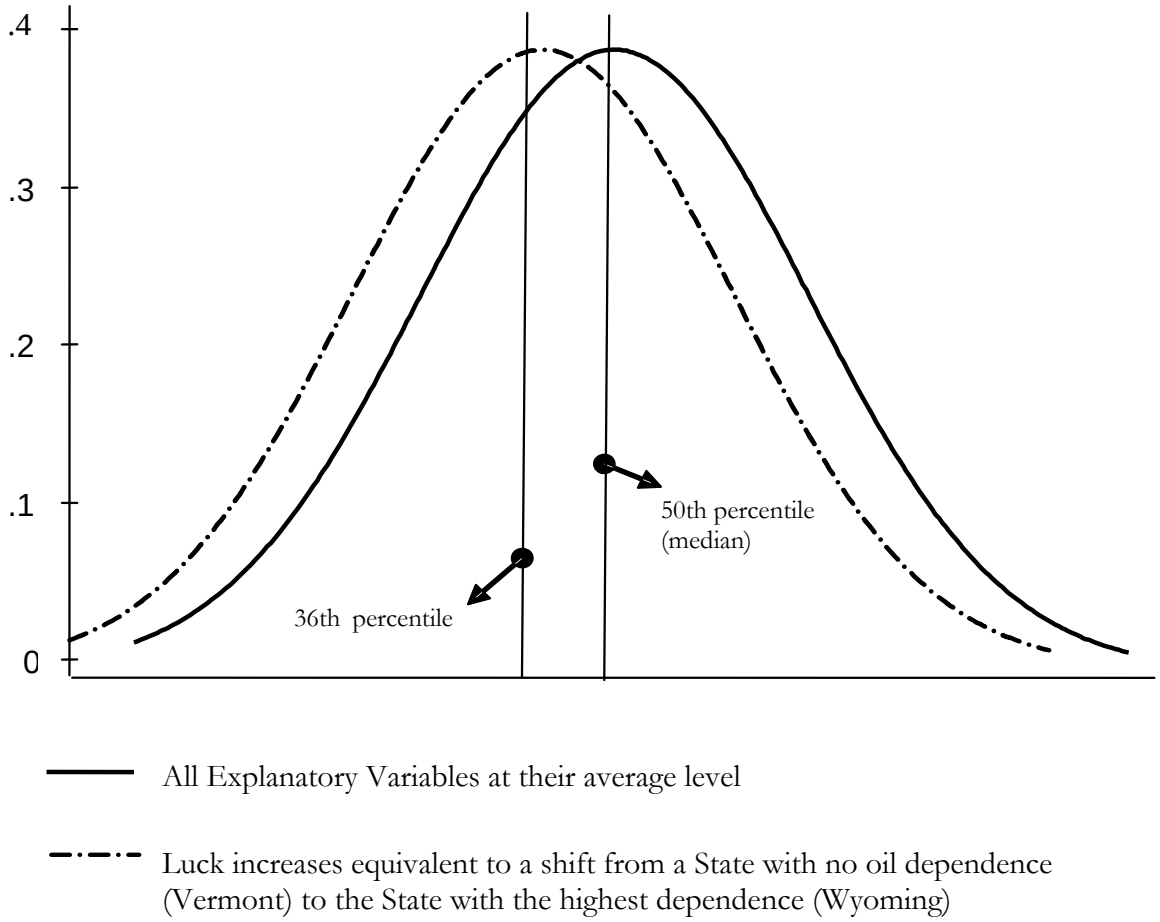

Figure 3: The Probability Density Function of *Help Poor - R_{ist}*

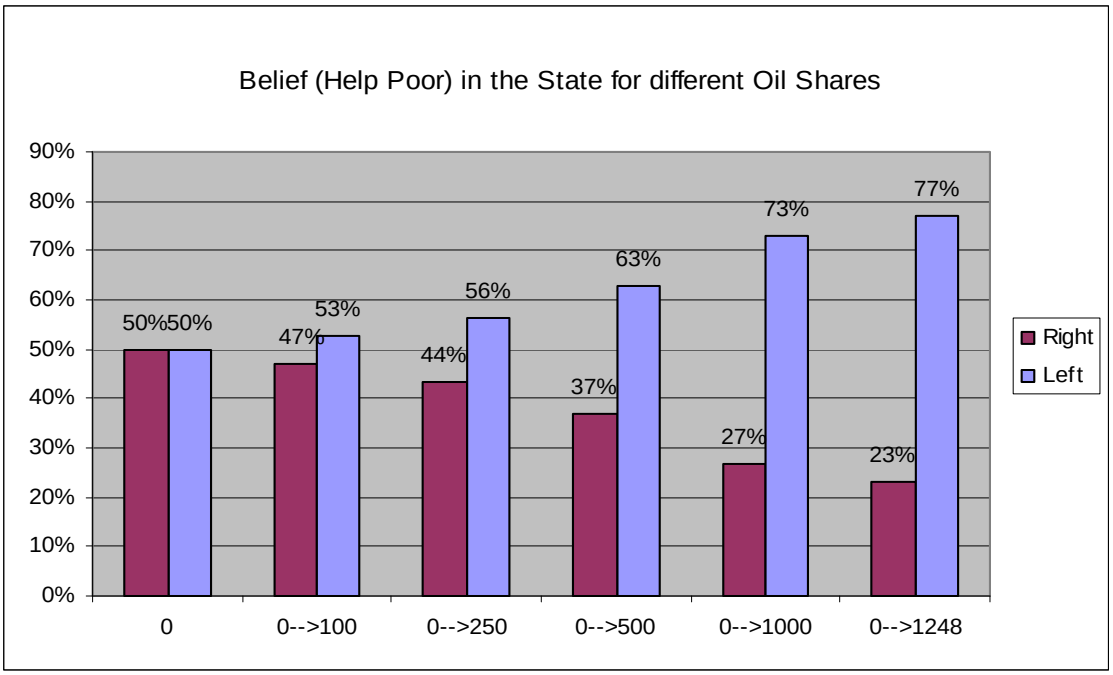

Figure 4: Average Belief (Help-Poor) predicted in the State for different shares of the oil industry in State GDP (times the price of oil), using the coefficient in column (4) in Table 1.

Table 1
How Beliefs about Helping the Poor vary with Luck
Ordered Logit Regressions; United States General Social Surveys: 1983-2004

Dependent variable: *Help Poor-R*		*(1)*	*(2)*	*(3)*	*(4)*
Luck		-4.25e-04	-1.70e-04	-4.48e-04**	-6.48e-04***
		(3.13e-04)	(2.82e-04)	(2.09e-04)	(1.99e-04)
Marital Status	- Widowed				0.0837
					(0.0751)
	- Divorced				-0.0845*
					(0.0496)
	- Separated				-0.2764***
					(0.0907)
	- Never Married				-0.0512
					(0.0346)
Female					-0.2550***
					(0.0293)
Personal Income	- Income 2				-0.4826**
					(0.1902)
	- Income 3				-0.5495***
					(0.1802)
	- Income 4				-0.7108***
					(0.2069)
	- Income 5				-0.6494***
					(0.2066)
	- Income 6				-0.5890***
					(0.2027)
	- Income 7				-0.4243*
					(0.2189)
	- Income 8				-0.2874
					(0.1935)
	- Income 9				-0.1644
					(0.1944)
	- Income 10				-0.0680
					(0.1893)
	- Income 11				0.1712
					(0.1934)
	- Income 12 (top)				0.4121**
					(0.1909)
Age					0.0093***
					(0.0011)
Year Dummies		No	Yes	Yes	Yes
State Specific time trends		No	No	Yes	Yes
Pseudo R-sq		0.0042	0.0062	0.0077	0.0240
No. of States		44	44	44	44
No. of Years		15	15	15	15
No Obs.		17,401	17,401	17,401	17,401

Notes: See appendix B.

Table 2
How Beliefs about Helping the Poor vary with Luck
Robust OLS Regressions; United States General Social Surveys: 1983-2004

Dependent variable: *Help Poor-R*		*(1)*	*(2)*	*(3)*	*(4)*
Luck		-2.94e-04**	-1.22e-04	-2.92e-04	-4.08e-04**
		(1.23e-04)	(1.35e-04)	(1.79e-04)	(1.77e-04)
Marital Status	- Widowed				0.0534
					(0.0375)
	- Divorced				-0.0527*
					(0.0283)
	- Separated				-0.1824***
					(0.0506)
	- Never Married				-0.0317
					(0.0266)
Female					-0.1596***
					(0.0187)
Personal Income	- Income 2				-0.3159***
					(0.1111)
	- Income 3				-0.3589***
					(0.1100)
	- Income 4				-0.4589***
					(0.1080)
	- Income 5				-0.4187***
					(0.1061)
	- Income 6				-0.3761***
					(0.1081)
	- Income 7				-0.2731**
					(0.1065)
	- Income 8				-0.1822*
					(0.0999)
	- Income 9				-0.1003
					(0.0913)
	- Income 10				-0.0342
					(0.0921)
	- Income 11				0.1229
					(0.0917)
	- Income 12 (top)				0.2748***
					(0.0884)
Age					0.0059***
					(0.0007)
Year Dummies		No	Yes	Yes	Yes
State Specific time trends		No	No	Yes	Yes
R-sq		0.0119	0.0176	0.0219	0.0672
No. of States		44	44	44	44
No. of Years		15	15	15	15
No Obs.		17401	17401	17401	17401

Notes: See appendix B.

Table 3
How Beliefs about Helping the Poor vary with Luck; controlling for GDP per capita
Ordered Logit Regressions; United States General Social Surveys: 1983-2004

Dependent variable: *Help Poor-R*	*(1)*	*(2)*	*(3)*	*(4)*
Luck	-3.14e-04	-3.1e-04	-3.91e-04	-5.74e-04**
	(2.69e-04)	(2.92e-04)	(2.89e-04)	(2.79e-04)
GDP per capita (US$ 2000)	2.21e-05***	1.37e-05	-6.19e-06	-7.98e-06
	(5.07e-06)	(1.26e-05)	(2.46e-05)	(2.44e-05)
Marital Status - Widowed				0.0838
				(0.0751)
- Divorced				-0.0845*
				(0.0495)
- Separated				-0.276***
				(0.0907)
- Never Married				-0.0512
				(0.0346)
Female				-0.255***
				(0.0292)
Personal Income - Income 2				-0.483**
				(0.1903)
- Income 3				-0.5493***
				(0.18)
- Income 4				-0.7106***
				(0.2069)
- Income 5				-0.6493***
				(0.2066)
- Income 6				-0.589***
				(0.2027)
- Income 7				-0.4244**
				(0.219)
- Income 8				-0.2876
				(0.1937)
- Income 9				-0.1644
				(0.1944)
- Income 10				-0.0683
				(0.1894)
- Income 11				0.1712
				(0.1934)
- Income 12 (top)				0.4121
				(0.1909)
Age				0.0093**
				(0.0011)
Year Dummies	No	Yes	Yes	Yes
State Specific time trends	No	No	Yes	Yes
Pseudo R-sq	0.0049	0.0062	0.0077	0.0240
No. of States	44	44	44	44
No. of Years	15	15	15	15
No Obs.	17,401	17,401	17,401	17,401

Notes: See appendix B.

Table 4
How Beliefs about Helping the Poor vary with Luck; controlling for GDP per capita
Robust OLS Regressions; United States General Social Surveys: 1983-2004

Dependent variable: *Help Poor-R*	*(1)*	*(2)*	*(3)*	*(4)*
Luck	-2.2e-04*	-2.11e-04	-2.46e-04	-3.58e-04*
	(1.23e-04)	(1.58e-04)	(2.19e-04)	(2.16e-04)
GDP per capita (US$ 2000)	1.43e-05***	8.79e-06	-4.95e-06	-5.46e-06
	(2.31e-06)	(8.10e-06)	(1.36e-05)	(1.34e-05)
Marital Status - Widowed				0.0534
				(0.0375)
- Divorced				-0.0527*
				(0.0283)
- Separated				-0.1824***
				(0.0506)
- Never Married				-0.0317
				(0.0266)
Female				-0.1596***
				(0.0187)
Personal Income - Income 2				-0.316***
				(0.1111)
- Income 3				-0.3589***
				(0.1100)
- Income 4				-0.4589***
				(0.1080)
- Income 5				-0.4187***
				(0.1061)
- Income 6				-0.3761***
				(0.1081)
- Income 7				-0.2731**
				(0.1065)
- Income 8				-0.1822*
				(0.0999)
- Income 9				-0.1003
				(0.0913)
- Income 10				-0.0342
				(0.0921)
- Income 11				0.1229
				(0.0917)
- Income 12 (top)				0.2748***
				(0.0884)
Age				0.0059***
				(0.0007)
Year Dummies	No	Yes	Yes	Yes
State Specific time trends	No	No	Yes	Yes
R-sq	0.0119	0.0176	0.0219	0.0672
No. of States	44	44	44	44
No. of Years	15	15	15	15
No Obs.	17401	17401	17401	17401

Notes: See appendix B.

Table A
Summary Statistics for the Aggregate Variables

Variable	Obs.	Mean	Std. Dev.	Min.	Max.
Help Poor-R	Total= 17,401	2.90	1.16	1	5
- between	n=95		0.28	2	3.82
- within	T-bar= 183.168		1.16	0.55	5.90
Oil Price	Total= 17,401	22.47	8.54	11.27	40.16
- between	n=95		6.87	14.61	38.25
- within	T-bar= 183.168		7.91	9.30	39.83
Oil Share	Total= 17,401	1.33	3.75	0	31.21
- between	n=95		5.43	0	26.67
- within	T-bar= 183.168		2.94	-5.26	31.19
*Luck(s,t)=Oil Price(t)*Oil Share(s,t)*	Total= 17,401	34.62	116.93	0	1248.16
- between	n=95		151.21	0	837.34
- within	T-bar= 183.168		96.76	-425.55	1250.46