A Note on Redistributive Fairness and Economic Reform*

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Abstract

To understand reasons for possible failures of 'good' economic reforms, we consider an institution (polity) which is always successful in making the best public decision from the utilitarian perspective. We show it is bound to introduce inequality if costs of a reform are privately known: the losers can not be always compensated. Thus, if equity is a primary concern then some reforms with positive net aggregate benefit might not be undertaken, or fail. If the utilitarian welfare is the only guide for making public decisions, implementing a reform might require the ability to neglect the associated 'distributional' cost.

Key words: economic change, common decision-making, equity, efficiency.

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1 Introduction

> "Western countries said democracy would help economic reform in Africa. Its rulers said only authoritarian government could do it. Both were wrong... In Asia and Latin America, economic reforms had often been started by authoritarian regimes, but in Africa, where states are fragile, governments have had to carry out economic reforms and democratise at the same time."[1]

Not surprisingly, similar debates have emerged in economic literature; omitting the review, we mention just two directly related contributions. Good reforms might not pass in some citizen-candidate equilibria, as Jain and Mukand (2003) have shown; moreover, probability of success of a reform might not be monotonic in gains the reform brings. Fernandez and Rodrik (1991) demonstrate that individual-specific uncertainty, i.e., inability of an individual to assess with certainty whether she will be a winner or a loser, can hinder good reforms, if no transfers are allowed and the decision is made under a simple majority rule. While providing an important step in understanding difficulties that reforming entails, this approach — picking one particular mechanism of implementing reforms and showing that it might fail sometimes — is not sufficient to understand fundamental reasons behind the obstacles a reformer might face, for at least two reasons.

1. It is not clear whether it is the uncertainty (or asymmetric information) about individual attitudes towards the reform that causes the failure or it is the particular way the decision about the reform is made. Moreover, if one is to adopt a view that institutions (understood here as ways to make common decisions) are endogenous — in a sense that bad, inefficient institutions evolve (under mutual consent) into more efficient ones — then blaming them for the failure provides a 'short-term' explanation, thus, potentially, concealing the 'fundamental' factors that are responsible for the phenomenon.

2. The decision about the reform is rarely based just on an announced platform of a victorious politician — mass media (sometimes taking a 'strong' stand), demonstrations, etc., might affect it as well. Hence even from a positive perspective one would want to analyze a wider range of possible ways to make this common decision.

[1] The Economist, Sept 18th 1997, p.49.

To sum up, in order to identify fundamental reasons for why reforms fail, one has to understand what is necessary to always implement 'good' reforms, and why the associated policies might be unacceptable, which we do next. The basic lesson from this brief investigation is that the most efficient institutions are not always 'fair', as they have to introduce unequal distribution of net benefits, even though after the reform there are enough resources to redistribute so that everyone's welfare equally improves. Thus, if equity is a primary concern, — which, in particular, implies that those who lose more have to be compensated more, — then some good reforms might fail. If the aggregate net benefit is the only guide for making public decisions, undertaking a reform might require a substantial 'political capital' for its implementation.

2 Optimal Transfers

First we want to describe the optimal transfers (taxes/subsidies) that are needed to *always* implement a 'good reform' in the presence of asymmetric information about individual costs, i.e., incentive-compatible (IC) transfers. Next, we inspect properties of these transfers, concluding that they inevitably introduce inequality.

2.1 How to Carry out Good Reforms

We want to stress that asymmetric information per-se does not necessarily prevent good reforms. To do so we adopt a rather standard argument.[2] N risk-neutral individuals living in a country have to decide whether to make a reform. The status-quo payoff is zero to all. In case the reform is undertaken, each individual gets the same (normalized) benefit $a > 0$, but 'personal' costs of transition differ and those are only privately known. This formulation is a 'reduced form' of the models mentioned in the introduction, moreover, it is closely related to the approach accepted in development economics.[3] Alternatively, one can view both the benefit and the cost as privately known, thereby preserving the important feature of this model — asymmetric information about net benefits. We want to enable the 'first-best' decision-making procedure that maximizes the ex-ante utilitarian welfare, i.e., the one that

[2]See, e.g., d'Aspremont and Gérard-Varet (1979).

[3]See Ray (2000) for the overview and examples of the relevant policies.

prescribes the reform if and only if the sum of the costs is below the total benefits. To elicit information about the costs, one has to provide proper incentives, say, to either compensate an individual with a monetary transfer $\tau > 0$, or tax (punish) him with $\tau < 0$. The transfers across individuals have to sum up to some number T, which reflects the resources available for carrying out the reform. If $T = 0$, we impose 'a balanced budget'; if it is positive, there is an outside source of financing the reform, and if it is negative, the reform must generate a given amount of wealth.

Assume that the uncertainty is 'idiosyncratic,' so that the costs incurred by individuals can be viewed as independent random variables. For example, those might be the costs of adapting to new ways of doing business, operating computerized data bases, tolerating a wider range of social norms, etc. For simplicity of exposition, assume all of them are drawn from the same distribution F with compact support $[\underline{c}, \bar{c}]$ and density $0 < f < \infty$ on $[\underline{c}, \bar{c}]$. Also, we consider only 'interesting cases,' in which desirability of a reform is not clear ex-ante, i.e., $a \in [\underline{c}, \bar{c}]$.

We want to describe a decision-making procedure, under which the right decision *can be* made.[4] Hence, we can apply the revelation principle. Let us imagine that individuals 'report' their costs by dancing in the streets, burning tires, writing newspaper articles, etc. and they get taxed/compensated based on such a report, according to some ex-ante known rule, $\tau : [\underline{c}, \bar{c}] \to \mathbb{R}$. This rule is anonymous, identical individuals are to be treated identically: the transfer is independent of 'irrelevant' individual characteristics, just the reported costs of transition come into play, as such it is 'horizontally' equitable in the ex-post sense (after the costs are realized). And, of course, the reform goes ahead only if the sum of the reported costs is below Na, so that from the point of view of individual i reporting r, the probability that the reform happens, $Q(r)$, is just $\Pr\left(\sum_{j \neq i} c_j + r \leq Na\right) = F_{N-1}(Na - r)$, where F_{N-1} is the distribution of the sum of $N-1$ random variables (costs incurred by others, $(c_j)_{j \neq i}$), each independently drawn from F.

Consider an individual, whose cost is c and who reports r. His (interim) payoff is then

$$V(r|c) = Q(r)(a - c) + \tau(r)$$

To motivate a truthful report, the transfer should be chosen such that the 'first order conditions' are satisfied,[5] so that reporting true cost, $r = c$, is

[4] Thus, we are interested in a 'weak' implementation.

[5] Sufficiency follows by the standard argument from monotonicity of Q.

optimal for such an agent, i.e.,[6]

$$V'(c|c) = Q'(c)[a-c] + \tau'(c) = 0 \tag{1}$$

Condition (1) is incentive compatibility, and it is equivalent to

$$\tau'(c) = (c-a)\,Q'(c) \tag{2}$$

One can solve this equation for τ, by integrating both sides,

$$\tau(c) = \int_{\underline{c}}^{c} (x-a)\,dQ(x) + \tau(\underline{c}) \tag{3}$$

where the constant, $\tau(\underline{c})$, depends on (total expected budget) T through condition $E(\tau(c)) = T/N$, so (by integrating equation 3 by parts),[7]

$$\tau(\underline{c}) = T/N + \int_{\underline{c}}^{\bar{c}} (1-F(c))(a-c)\,dQ(c) \tag{4}$$

Clearly, equations $(3, 4)$ fully describe the incentive compatible transfer scheme,[8] which enables to elicit true costs from individuals and to adopt the reform iff the costs are below the benefits. So, again, *the presence of asymmetric information does not have to prevent good reforms from being undertaken.* What does then?

Individuals might be concerned about the distribution of net benefits. In a 'fair' world they might expect the 'losers' to be compensated, implying transfers should increase with costs. Besides, given that the total gain under a good reform is sufficient to fully compensate everyone, such redistribution should take place, they might argue. However, these requirements might be inconsistent with the optimality.

2.2 Optimal Transfers are Single-Peaked in Costs

First, optimal transfers have to decrease for high enough costs.

Claim 1 *The expected incentive compatible transfer τ is non-monotonic, it increases for $c < a$ and decreases otherwise.*

[6]This holds for all the values of the argument c for which the derivative of τ exists.
[7]The integrals are well defined as $Q' < \infty$ by our assumptions on F.
[8]This also implies $\tau(c)$ is unique and continuous.

Proof. Clearly, the higher is individual report, the lower is the chance the reform will go ahead, $Q'(c) = -F'_{N-1}(Na - c) < 0$, so the conclusion follows from (2). ■

We showed that the optimal transfer should be quasiconcave with the peak at $c = a$. No doubt, this rule is sensible: those with low costs (below a) view reform as desirable, and, in the absence of transfers, would want to increase the chance it happens, thus having a clear motivation to under-report the costs. To prevent that from happening, the transfers should increase with the reported costs to make sure reporting a smaller cost will also cause a reduction in compensation, τ, exactly equivalent to the benefit from an increased likelihood of the desired event. Similarly, those with higher costs ($c > a$) should not be interested in trying to prevent a reform by inflating their costs, as their compensation will decrease as a result.

It is important to understand that according to this rule those with costs above the gain ("opposition to the reform") should expect to get smaller transfers than some of those, whose costs are lower (say, individuals with costs comparable to the gain, a). Hardly a popular rule — whether individuals are aware of the personal cost to pay or not.

In the next section we show that the single-peakedness of individual expected transfers is limiting the actual (ex-post) compensation, especially for a 'big' country.

2.3 Compensation Shrinks with the Number of Individuals

The next result implies that if the number of individuals is high enough, incentive compatibility prescribes the transfer scheme to be less sensitive to the cost reports, thereby decreasing the range of transfers to be distributed. As N approaches infinity, individual compensation becomes independent of costs.[9] Let the range of expected transfers be denoted by $\Delta_\tau \overset{\text{def}}{=} \max_{x,y\in[\underline{c},\bar{c}]} |\Delta\tau(x,y)|$, where $\Delta\tau(x,y)$ is the difference in transfers for individuals with costs $x, y \in [\underline{c}, \bar{c}]$, $x > y$.

Claim 2 *The range of expected transfers, Δ_τ, narrows to zero when $N \to \infty$.*

[9]This is independent of what is the initial distribution of costs, F, and, therefore, applies to cases, when no information about this distribution is available. Clearly, if the mean of the distribution is known, with N high enough, desirability of the reform can be determined without eliciting any information from the individuals.

Proof. Note that by characterization (3), $\Delta\tau(x,y) = \int_y^x (c-a)\,dQ(c)$, for $x, y \in [\underline{c}, \bar{c}]$, $x > y$. By the Central Limit Theorem, as N increases, F_{N-1} converges to Normal distribution with mean $(N-1)\mu_F$ and variance $(N-1)\sigma_F^2$, where μ_F and σ_F^2 are the mean and the variance of F correspondingly. This implies that for any finite $x, y : x > y$ the difference $F_{N-1}(x) - F_{N-1}(y)$ converges to zero as N increases, and therefore, so is $\int_y^x dQ(c)$. But the range of transfers is bounded by this expression times a constant, $|\Delta\tau(x,y)| = \left|\int_y^x (c-a)\,dQ(c)\right| \leq k\left|\int_y^x dQ(c)\right|$, $k = \max\{a, x\}$, so the result follows. ■

One can obtain a similar result if the number of individuals is sufficiently large (but fixed), so that $F_{N-1}(x)$ is sufficiently close to the Normal distribution, by increasing the variance σ^2 of the original distribution of costs, F. As $Na - c$ belongs to the compact interval that contains the mean of $F_{N-1}(x)$ (recall, $a \in [\underline{c}, \bar{c}]$), one can make the density $F'_{N-1}(Na-c)$ arbitrarily low for $c \in [\underline{c}, \bar{c}]$ by increasing σ^2. This, in turn, by (2), flattens the transfer function.

Now let us think about the implications of the range of expected transfers being limited by, say, $\varepsilon > 0$. Assume for now there are no outside funds, $T = 0$. How should the transfer scheme look like under the two scenarios: if the reform goes ahead and if it is decided against?

Let τ_A (τ_B) be the transfer scheme in case of reform (no reform). To fully compensate the losers $\tau_A(c)$ has to be increasing. By quasiconcavity (claim 1), the range of the expected transfer, $\tau(c)$ on $[\underline{c}, \bar{c}]$ is the biggest of the differences $H \overset{\text{def}}{=} \tau(a) - \tau(\bar{c})$ and $L \overset{\text{def}}{=} \tau(a) - \tau(\underline{c})$. We will focus on L. Let $\Delta Q \overset{\text{def}}{=} Q(\underline{c}) - Q(a) > 0$, $\Delta\tau_s \overset{\text{def}}{=} \tau_s(a) - \tau_s(\underline{c})$, $s \in \{A, B\}$, which implies $L = Q(a)\,\Delta\tau_A + (1 - Q(a))\,\Delta\tau_B - \Delta Q(\tau_A(\underline{c}) - \tau_B(\underline{c}))$. Then, if $Q(a)\,\Delta\tau_A > \varepsilon$, so that the transfer scheme is increasing sufficiently fast (or the range is small enough), the rule implies that either $\Delta\tau_B < 0$ or $\tau_A(\underline{c}) - \tau_B(\underline{c}) > 0$ or both. The first inequality implies *the tax for a higher reported cost, $a > \underline{c}$, is higher in case of no reform.* The second inequality requires the transfer to the highest potential beneficiary from the reform, in case it is decided against, should be *lower* than in case the reform is initiated, in particular, if $\tau_A(\underline{c}) < 0$, i.e., she is taxed if a reform is undertaken, then $\tau_B(\underline{c}) < 0$, she should also be taxed, if it is not. Therefore, the proponents of a reform, too, are 'punished' in case it does not start at all.

Hard to imagine a victorious politician running on a platform supporting such transfers.

Another way to implement an incentive transfer scheme in this case, of course, is to adopt a rather flat τ in both cases (reform or not). This, clearly, limits re-distribution of gains and therefore, shares the same problem.

In general, the results presented so far imply that, as a consequence of even considering a reform, the distribution of net benefits becomes more unequal as compared to the status-quo. Recall, the required transfers depend on potential costs, and if the costs are beyond individual control (say, related to innate ability), the resulting distribution would be based on a 'pure luck' as viewed by a citizen. If such 'ex-ante' horizontal equity considerations are important, good reforms, with aggregate benefits about total costs, will not be undertaken.

Instead of considering the whole distribution of the after-transfers (net) benefits, one can consider another, "Rawlsian" equity criterion, which, in this case, is the well-being of the individual with the highest cost.

2.4 The Least-Fortunate Might Lose

Under the incentive-compatible transfer rule the expected utility of a person with cost $\bar{c}$ is the lowest, making him 'the least-fortunate' in the country. To see that let $U : [\underline{c}, \bar{c}] \to \mathbb{R}$ be an expected utility of an agent who reports his true cost, c, given the rest of the agents report their true costs as well, i.e., $U(c) = Q(c)(a - c) + \tau(c) = V(c|c)$. Using first order condition (1), we get the (by-now) textbook characterization,

$$U'(c) = -Q(c) \Rightarrow U(c) = U(\bar{c}) + \int_c^{\bar{c}} Q(x)\, dx \tag{5}$$

which implies that U, the after-transfer expected utility, is strictly decreasing in cost c.

The next claim assures that reforms with bigger gains make everyone better-off, including the least-fortunate individual. Immediate also from (4) and (3) that increasing 'the outside sources of financing the reform', T, has the same effect. By the way, it also implies that a 'bigger pie' should make reforms easier, as one would expect, and contrary to the finding by Jain and Mukand (2003), who rely on a particular decision-making mechanism.

Claim 3 *The expected utility $U(c)$ grows with a.*

Proof. Follows from (5) by noting that $Q(x) = F_{N-1}(Na - x)$ is increasing in a. ■

Clearly then, a lower gain, a, (or a tighter budget, T) might push the utility of the highest-cost individual below zero,[10] thus below the 'status-quo' level, i.e., the payoff in the absence of a 'reform institution' (either embodied as a ruler who commits to the first-best transfer scheme, or a set of rules to be agreed upon by the individuals residing in a country, say, a 'law'), which, in particular, implies that the least-fortunate will be either under-compensated in case the reform is initiated or taxed in case it does not, or both. This, in turn, can make some individuals reluctant to 'sign up' to such a law (or support such a reformer), even if at that time they are still uncertain about their costs (as in Fernandez and Rodrik (1991)).

3 Conclusions

We have illustrated a version of the 'equity-efficiency' trade-off facing a reformer: the optimal transfers supporting good reforms in the presence of asymmetric information about personal costs of transition might not always be acceptable, as they introduce unequal final distribution of net benefits. Interestingly, it is not uncommon to see 'unfair' distribution of final benefits associated with large-scale reforms. As an illustration consider Soviet industrialization of the 1930's infamously associated with forced (convict) labor[11] and "concentration of resources on heavy industry to the detriment of agriculture".[12] With any form of opposition violently suppressed (but not necessarily ignored), the reforms went through, accompanied by stagnation of agriculture till at least 1956, and severe food-rationing for most of the citizens. It is hard to even speculate whether benefits outweighed the costs in that case, as constructing a convincing alternative (counterfactual) scenario is difficult to start with. However, it is clear that completely ignoring equity considerations and relying on forced transfers might give way to 'bad' reforms, with negative net gain, creating some benefit to a small group at the expense of the others.

[10] This is an indirect implication of the impossibility of implementing first best under 'individual rationality' constraint ($U(\bar{c}) = 0$) coupled with budget balancedness ($T = 0$), see, for example, Myerson and Satterthwaite (1983), Mailath and Postlewaite (1990), Rob (1989).

[11] Allen (2003) provides a variety of estimates ranging from 23% to 2% of the workforce provided by the inmates during that period.

[12] Allen (2003, p. 109). See also Jasny (1961, p.419) for evidence of artificially low prices of agricultural products in later years of the industrialization.

One might want to embed equity into a social objective and look for the decision rule and transfers that maximize it, or, at the very least, constrain the ex-post distribution of net benefits (as measured, say, by the Gini index). However, under such rules, *some* reforms generating positive net gain, $Na - \sum_i c_i$, will not be carried out, thus 'leaving the money on the table.' Same applies if one is to adopt the 'Rawlsian' constraint of protecting the least fortunate.[13] These observations echo the findings in the recent literature on endogenous inequality studying the effect of "market mechanisms" on distribution of incomes, Matsuyama (2000), Mookherjee and Ray (2007): individual incentives, naturally, are crucial, though the mechanism itself in those models, is different.

We do not offer a resolution to the 'equity-efficiency' trade-off, though its formulation might shed some light on why, as noted by Rodrik (1996, p. 10) in his overview of economic reforms (1960-1980) around the world, *"...the implementation of good economic policy is often viewed as requiring 'strong' and autonomous' (not to say authoritarian) leadership."*[14]

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[13]These implications are independent of the probability distribution which generates individual costs of transition, as long as they are independent. Allowing for some form of interdependency, as Neeman and Lehrer (2000) show, does not resolve the trade-off: when the number of individuals grows, requiring the reform to have unanimous support (assuring a positive expected net payoff to all) leads to failure of accepting any changes. Other forms of correlation in costs might help to assure first-best with non-negative expected payoff to all, see McAfee and Reny (1992), but the ex-post (actual) net payoffs are not guaranteed to be positive.

[14]See also Harberger (1993), Velasco and Tommasi (1996) for similar accounts.

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