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ECONOMIC REFORMS AND POLITICAL CONSTRAINTS: ON THE TIME INCONSISTENCY OF GRADUAL SEQUENCING

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Abstract

This paper presents a model portraying a country in a political deadlock about reform proposals that hurt strongly organized interest groups. We show that, under some circumstances (no ability to precommit, veto power by interest groups), only far reaching reforms (even if quite costly) have hope of success. The model intends to explain why in recent years several Latin American countries have gone for radical reform.

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1. Introduction

Governments all around the world are implementing market-oriented reforms. Two questions have been at the forefront of the academic and policy discussion: (1) the order in which to implement reform on different fronts such as trade vis a vis public sector reforms ("**ordering**" or "**sequencing**"), and (2) the appropriate "**speed**" of reform in each front (for instance how fast one should remove tariffs and NTBs). In this paper, we contribute to the discussion of sequencing.

The optimal sequence of reforms depends on both economic and political criteria. The neoclassical benchmark is simple: do all reforms simultaneously. Radical or big-bang reform is the first best reform strategy, argued Mussa (1982) early on in the debate. As long as the perceived private costs and benefits correspond to the true social costs and benefits, private economic agents will choose the socially correct pace of adjustment following full scale liberalization. The only caveat applies when one can clearly identify a distortion that places the economy in a second best world: if that is the case, one might be able to design a particular sequencing strategy that can take care of the problem. Several authors have provided arguments for particular gradual paths along these lines.[1]

A recent and very relevant argument is put forth by Dewatripont and Roland (1994), henceforth DR. Their basic point is that when there is uncertainty about the outcome of economic reforms, "sequencing" (i.e. waiting to see the results of early reforms before moving on) has lower experimentation costs than does a big bang. One of their findings is that, contrary to common belief, complentarity of reforms (defined in a way that will be made specific below) may tilt the balance in favor of sequential as opposed to simultaneous implementation. If partial reforms are unstable (in the sense they cannot yield full results unless complemented by other reforms), at each stage of the transition the choice is between accepting the next set of reforms or reversing the previous ones, and hence later reforms are more likely to be accepted if the initial ones have proven successful.

In this paper we argue that, even when gradualism would be the choice of

[1]See for instance Edwards (1984), McKinnon (1991), and Gavin (1993). A comprehensive survey of the literature on economic reforms, with particular emphasis on political-economy considerations is Tommasi and Velasco (1995). We refer the reader to that article for the discussion of all the papers not directly relevant to our point here, as well as for a summary description of reform experiences.

an unconstrained social planner, time-consistency considerations in a political-economy game may force simultaneous implementation of all possible reforms. In societies with powerful interest groups and characterized by a cobweb of redistributive and distortionary policies (most of Latin America, for instance), "optimal" sequential plans will be time inconsistent. Winners from early reforms will oppose later reforms which hurt them. Knowing that, losers from early reforms will oppose the earlier measures. In such an environment, a big bang is the only way of cutting through the Gordian knot of rents implicit in previous policies.

To illustrate our point, we present a simple game in which the government is an agenda-setter facing strongly organized interest groups. Reforms are complementary in economic terms, in the sense that there are losses from implementing only part of the possible reforms. Outcomes are uncertain; so, as in DR, gradualism has the advantage of allowing for early (and less costly) reversal of reforms. However, if the distributive effects of reforms are large enough, gradualism becomes time inconsistent. The crucial step in the argument is that distributive effects could be strong enough to compensate some groups for the aggregate costs associated with a partial (truncated) process of reform, thus rendering partial reform a desirable outcome for some groups in the economy. If that is the case, the optimal (gradual) sequence will unravel.

2. The model

2.1. Setup

We consider a discrete-time, infinite horizon game with discount factor δ. There are two possible reforms, 1 and 2, and two interest groups, 1 and 2.

Reform 1 has a "good" outcome with probability $1-\pi$ and a "bad" outcome with probability π.[2] In case of a good outcome, per-period payoffs from reform 1 are $(G-d)$ for group 1 and $(G+d)$ for group 2. In case of a bad outcome, payoffs are $(B-d)$ for group 1 and $(B+d)$ for group 2. You can think of it as a trade reform, which might elicit a strong or a weak growth effect, but clearly redistributes income away from producers of importables (group 1 in the example).

The outcome of reform 2 is deterministic, with per-period payoffs $(M+d)$ for group 1 and $(M-d)$ for group 2. Think for instance of a fiscal reform that allows for macroeconomic stabilization, but redistributes income away from public employees and recipients of government subsidies. It is understood that $B<0$;

[2] Uncertainty about the outcome of reforms may reflect the effects on large scale reforms of variables such as foreign investment, private sector response, etc. Aggregate uncertainty is crucial in this model for gradualism to make any economic sense.

$G, M > 0$; and $d \geq 0$. Obviously, d represents the *distributive effects* of reform.[3][4]

As in DR, reforms are *complementary* in the sense that the payoffs from a given reform are lower is such reform is implemented alone than if the whole package is in place. In particular, the penalty of having reform 1 alone is γ per period (and per capita), while the penalty for having reform 2 alone is so large (lets say infinite) that it never pays to have in place reform 2 alone. This simplifies the analysis by reducing the number of cases to consider, but it is in no way necessary for the main point. Under this assumption, the choice at any point will be between having just reform 1, both of them, or neither.

Reverting reforms is costly. The cost of reversing both reforms is c, the cost of reversing only reform 1 is c_1, and the cost of reversing reform 2 is c_2. (It turns out that in equilibrium, reform 2 - deterministic and beneficial - will never be reversed, independently of the value of c_2.) It is assumed that $0 < c_1 < c$, that is to say, it is costlier to reverse a more comprehensive attempt at reform.

Payoffs for the government are an average of payoffs for the interest groups. In

[3]Our description of the possible outcomes of reforms differ from the one in DR, who assume that all individuals are identical, at least in ex ante terms. This difference may be due to the fact that they concentrate in the case of Eastern European countries, which have had a very limited experience with the market as compared with Latin American countries.

[4]Rodrik (1994) uses a concept he calls "political cost-benefit ratio": the ratio of the total redistribution generated by a reform to its efficiency benefits. Such a concept would be d/M in our model. In that paper, Rodrik provides an explanation of **why** countries are implementing trade reforms **now**. His explanation shares the "bundling" view that we use to explain sequencing choices.

other terms, government payoffs are identical to those of the interest groups with the exclusion of the term d. The government is the agenda-setter in the sense that it has the power to make a policy proposal each period, which the interest groups can either reject or accept. The government can propose to initiate reforms not yet in place or to revert those already carried out. Interest groups have an effective veto power: If any interest group rejects the government proposal, the status quo from previous period is maintained.[5]

In deciding a sequence of proposals, the government must take into account not only economic considerations (the payoffs associated with the chosen path) but also the possibility of pulling off the reforms. Neither the government nor the different interest groups have the capacity to precommit their actions. Without any reform, payoff per period is assumed to be zero for all agents.

[5]The same results can be obtained in a median voter model in which the interest groups described above retain each a third of the votes and there is another group of people with the remaining third of the votes interested in keeping the status quo in every period.

2.2. Timing, Information and Payoffs[6]

If reform 1 is proposed by the government and the interest groups accept it, all agents get to observe if the outcome is good or bad. After that, the government can propose to revert the reform, to initiate reform 2, or do nothing. If reform 1 proves unsuccessful, and it is maintained alone, payoffs for the government, group 1 and group 2, are, respectively, $\left(\frac{B-\gamma}{1-\delta}, \frac{B-\gamma-d}{1-\delta}, \frac{B-\gamma+d}{1-\delta}\right)$. If, on the contrary, reform 1 is reversed after a bad outcome and no action is taken subsequently, payoffs are $(B-\gamma-c_1, B-\gamma-d-c_1, B-\gamma+d-c_1)$.[7] If, after a bad outcome, reform 2 is proposed and accepted and no action is taken subsequently, payoffs are $\left(B-\gamma+\frac{\delta(B+M)}{1-\delta}, B-\gamma-d+\frac{\delta(B+M)}{1-\delta}, B-\gamma+d+\frac{\delta(B+M)}{1-\delta}\right)$.

Payoffs for the three possibilities after a good outcome of reform 1 are obtained as above, substituting G for B.

If both reforms are proposed by the government and the interest groups accept

[6]We refer the reader to Figure 1, where we illustrate the payoff vector for the government, group 1 and group 2. Notice that the figure is not a game tree, since we collapse to single nodes the outcome of the actions of the 3 players (for instance "REFORM 1" means that the government proposed it and it was accepted by both groups.) Also notice that we omit several payoff vectors that will never be attained in equilibrium.

[7]Notice that the absence of a δ in front of c embeds the assumption that reversal of reforms takes place at the end of the same period in which they were implemented. Obviously this is not necessary and it is just a normalization of reversal costs.

this proposal, all agents get to observe if the outcome of reform 1 is good or bad. Clearly, after a good outcome in reform 1, the government will have no incentive to make any subsequent proposal. Payoffs in this case ("successful big bang") will be $\left(\frac{G+M}{1-\delta}, \frac{G+M}{1-\delta}, \frac{G+M}{1-\delta}\right)$. After a bad outcome, however, the government can propose in period 1 to reverse both reforms, to revert reform 2 or do nothing. (The government will not want to revert only reform 1, since the payoff from having reform 2 alone is $-\infty$.) If the new status quo is maintained after a bad outcome, payoffs are $\frac{B+M}{1-\delta}$ for every player. If both reforms are reversed, payoffs are $(B + M - c)$ for every player. If only reform 2 is reversed, payoffs are $\left(B + M - c + \frac{\delta(B-\gamma)}{1-\delta}, B + M - c + \frac{\delta(B-d-\gamma)}{1-\delta}, B + M - c + \frac{\delta(B+d-\gamma)}{1-\delta}\right)$. Notice that this last option will never happen since it is clearly dominated for the government (and for group 1) by keeping both reforms.

We will ignore more complicated paths, including, for instance, repeated proposals or delay by the government in proposing the reforms by assuming that the government and the interest groups follow stationary strategies.[8]

The following assumption (A) establishes an upper bound on the cost of re-

[8]Repeated attempts at reform and delay have been, of course, frequent in reality. To understand delay it seems necessary to introduce either imperfect information or some nonstationarity in the economic or political environment. See Drazen (1994) and Tommasi and Velasco (1995) for surveys of the literature on delayed reforms.

versal:

$$c < -\frac{\delta}{1-\delta}(B+M)$$

Assumption (A) insures that experimentation (reversing reforms with bad outcomes) is worthwhile. It also insures that the government dislikes partial reforms. Notice that it implies $-B > M$.

2.3. Sequencing of reforms without political constraints

We analyze first the case in which $d = 0$, that is, if there are no distributive conflicts associated with reform because the two interest groups and the government have the same payoffs. Equivalently, this is the case of a politically unconstrained dictator. This is analogous to the case studied in section 3 of DR.

The government is able to choose the path that maximizes its ex ante expected payoff. At time zero, it has to choose between implementing both reforms at once or implementing first reform 1.

Suppose the government implements both reforms at once. It is clear that it will stick to the result if there is a good outcome. It will choose to revert both reforms after a bad outcome if $\frac{B+M}{1-\delta} < B + M - c$, which is satisfied given (A). We will call "*big-bang*" this sequence of reforms (implementing both reforms at once and reverting the whole process if the outcome of reform 1 turns out to be bad). The expected payoff associated with big-bang is, then,

$$EV(BB) = (1-\pi)\left(\frac{G+M}{1-\delta}\right) + \pi\,(B+M-c) \tag{2.1}$$

To simplify matters, we will assume that this expected payoff is positive, so that the status quo at time zero is never a preferred option for the government.

Now suppose the government implements first reform 1. It is clear that it will propose reform 2 after a good outcome in reform 1. After a bad outcome, it will prefer to revert the process rather than stick to partial reform with a bad outcome if

$$c_1 < -\frac{\delta}{1-\delta}\,(B-\gamma)$$

which is implied by (A) and $c_1 < c$. Similarly, it will prefer to revert the process rather than going for reform 2 if

$$c_1 < -\frac{\delta}{1-\delta}\,(B+M)$$

which is also implied by (A) and $c_1 < c$. We will call "*gradualism*" this sequence of reforms (Implementing first reform 1 and following with reform 2 if the outcome is good or reverting reform 1 if the outcome is bad). Then, the expected payoff associated with gradualism is:

$$EV(GR) = (1-\pi)\left(G - \gamma + \frac{\delta}{1-\delta}(G+M)\right) + \pi(B - \gamma - c_1) \qquad (2.2)$$

Comparing equations (2.1) and (2.2), we see that $EV(GR) > EV(BB)$ as long as $\gamma + M < \pi\,(\,c - c_1)$ Hence, we can state the following

Lemma 2.1. *The government's preferred sequence of reforms is a gradualist sequence as long as* $\gamma + M < \pi\,(\,c - c_1)$. *Otherwise, it prefers to follow a big-bang approach.*

This lemma is easy to interpret. The loss associated with gradualism is given by the cost of reform 1 standing alone, γ, plus the loss of the benefits of reform 2 during the first period, M. The gain associated with gradualism is given by the savings in the costs of reversal, $c - c_1$, in case of a bad outcome, that occurs with probability π.

For reasons that will become apparent later, we will also consider two other possible sequences, which, as we just saw, are strictly dominated by gradual sequencing: Implementing first reform 1 and reverting it if the outcome is bad, but not going ahead with reform 2 if the outcome is good (*"partial reform with the* *option of reversal*") and implementing first reform 1 and taking no subsequent action ("*partial reform without reversal option*"). In the first case, the government payoff is

$$EV(P,R) = (1-\pi)\left(\frac{G-\gamma}{1-\delta}\right) + \pi\left(B-\gamma-c_1\right) \tag{2.3}$$

In the second case, the government payoff is

$$EV(P,NR) = (1-\pi)\left(\frac{G-\gamma}{1-\delta}\right) + \pi\left(\frac{B-\gamma}{1-\delta}\right) \tag{2.4}$$

Notice that $EV(BB) > EV(P,NR)$ if $c < \frac{1-\delta\pi}{\pi-\delta\pi}M + \frac{1}{\pi-\delta\pi}\gamma - \frac{\delta}{1-\delta}B$ which is implied by (A). Notice also that $EV(BB) > EV(P,R)$ if $(c-c_1) < \frac{1-\delta\pi}{\pi-\delta\pi}\left(M+\gamma\right)$, that is to say, if the cost of reverting big-bang reforms is not "too high" as compared to the cost of reform 1 standing alone, or the benefits of reform 2. Hence we can state the following

Lemma 2.2. *The government prefers a big bang to partial reform with the option of reversal as long as* $(c-c_1) < \frac{1-\delta\pi}{\pi-\delta\pi}\left(M+\gamma\right)$. *The government always prefers a big bang to a partial reform without the option of reversal.*

2.4. Sequencing of reforms with political constraints

We now analyze the case in which $d > 0$. With $d > 0$ payoffs of the interest groups differ from the government payoff, so that the government has to be concerned about being able to obtain their support for the policy proposals along the reform path.

The first thing to notice is that bundling of reforms after the government proposes a big bang eliminates the distributive conflict, so that the expected payoff for the government *and* the interest groups is the same and is given, as before, by equation (2.1):

$$EV(BB) = (1 - \pi)\left(\frac{G + M}{1 - \delta}\right) + \pi\,(B + M - c)$$

Notice that big bang is always feasible because $EV(BB) > 0$.

Things are a little more complex with gradual sequences. As usual, we solve by backward induction. Imagine that the government has proposes reform 1 and it has been accepted by both interest groups. Then, after either a good or a bad outcome, group 2 will veto going for reform 2 as long as

$$d > \gamma + M \tag{2.5}$$

So that

Lemma 2.3. *If $d > \gamma + M$, gradual sequencing is not feasible.*

That is to say, **if the distributive consequences of reform are large enough, gradualism is not feasible due to political constraints** (i.e., the government will not be able to get approval for the later stages of the gradual plan; as we will see below, this will unravel even the possibility of acceptance of earlier reforms.)

Also, after a bad outcome, group 2 will veto (early) reversal as long as

$$d > \gamma - B - \frac{1-\delta}{\delta}c_1 \tag{2.6}$$

The reason is that, in this case, the distributive gains to group 2 from reform 1 will be greater than their share of the aggregate loss to society from having partial reforms. Notice that, assumption (A) and $c_1 < c$ imply $\gamma - B - \frac{1-\delta}{\delta}c_1 > \gamma + M$ so that (2.6) implies (2.5).

Using equations (2.5) and (2.6) we can distinguish three cases following reform 1 being proposed and accepted:

(I) If $d > \gamma - B - \frac{1-\delta}{\delta}c_1$, partial reform (without the option of reversal) obtains.

(II) If $d \in \left(\gamma + M, \gamma - B - \frac{1-\delta}{\delta}c_1\right)$, the result will be partial reform with the option of reversal.

(III) If $d < \gamma + M$, the result is a gradual sequencing of reforms.

In case (III), the expected payoff for group 1 will be

$$EV_1(GR) = (1-\pi)\left(G - \gamma + \frac{\delta}{1-\delta}(G+M)\right) + \pi (B - \gamma - c_1) - d = EV(GR) - d.$$

Clearly, group 1 will then veto reform 1 at time zero if $EV(GR) < d$. To simplify matters, in what follows we will assume just the opposite, that is to say, gradualism is always better than the status quo for all the interest groups.

In case (II), the expected payoff for group 1 will be

$$EV_1(P,R) = (1-\pi)\left(\frac{G - \gamma - d}{1-\delta}\right) + \pi (B - \gamma - c_1 - d).$$

Clearly, then, group 1 will veto reform 1 if proposed by the government at time zero as long as $EV_1(P,R) < 0$. (Group 2 has no incentive to veto reform 1). Hence, we can establish

Lemma 2.4. *Partial reform with the option of reversal is not feasible if*

$$d > \frac{1-\pi}{1-\delta\pi} G + \frac{\pi - \delta\pi}{1-\delta\pi} (B - c_1) - \gamma \tag{2.7}$$

Putting together Lemmas 1 to 4, and under the assumptions $EV(BB) > 0$ and $EV(GR) > d$, we have the following result:

Proposition:

(i) If $d < \gamma + M < \pi(\ c - c_1)$, *there will be a gradual sequencing of reforms.*

(ii) If $\gamma + M < d < \frac{1-\pi}{1-\delta\pi} G + \frac{\pi-\delta\pi}{1-\delta\pi}(B - c_1) - \gamma$ *and* $\pi(c - c_1) > \frac{1-\delta\pi}{1-\delta}(\gamma + M)$, *there will be partial reforms (just reform* 1*) with the option of reversal.*

(iii) Otherwise, a big bang will be followed.

Notice that it is entirely possible that gradual sequencing were optimal from the viewpoint of the government, $\gamma + M < \pi(\ c - c_1)$, but a big-bang were followed because, say, (2.7) is satisfied. Moreover, **it is possible that a gradual sequencing of reforms were preferred to a big-bang sequence by everybody but political constraints force the government to follow a big-bang sequence.** This would be the case, for instance, if $EV(GR) - d > EV(BB)$ and

(2.7) is satisfied. Gradual sequencing would be time-inconsistent in this case: if the parties and the government could commit their future actions, the path of reforms would be gradual.

To present the main intuition in a graphical way, assume $\pi = 1/2$ and $\delta = 1$, and normalize M to 1. Then we have:

1) Big-bang is the planner's choice if $\gamma + 1 > \frac{1}{2}(c - c_1)$. Given that a big-bang is always feasible under our assumptions, it is also the equilibrium to the game.

2) Gradualism would be the planner's choice if $\gamma + 1 < \frac{1}{2}(c - c_1)$. It is not feasible (and then big-bang becomes the best *feasible* strategy and the equilibrium) when $d > \gamma + 1$.

This example is summarized in Figure 2.

Our main argument obtains in the southeast region of the figure: gradualism is the planner's choice, but political constraints (time-consistency) force a big-bang as the second best. This is more likely to happen, the larger d (the redistribution generated by each reform). In the appropriate range, it is less likely the larger γ. Economic complementarities, as in DR, act as a commitment device to go ahead with further reforms.

3. Conclusion

Using a model inspired by Dewatripont and Roland (1994), we have shown that the choice of a reform sequence by a government facing powerful interests, depends crucially on a number of parameters. Two are of particular importance: The economic complementarities across reforms or cost of partial reform (γ) and the distributive consequences of each reform (d). As shown by DR, contrary to popular intuition, economic complementarities (defined as sustainability of partial reform) can help make the case for gradualism. On the other hand, we show that the distributive implications of reforms play against a gradual sequencing of reforms. Time consistency is the crucial problem that makes political constraints binding.

Although we have assumed away issues of incomplete information to concentrate on the time consistency problem, the introduction of these issues need not counterweight the bias for radical reform we identified. A government with a serious credibility problem (the type of asymmetric information emphasized by Rodrik (1989)) may have an incentive to go radical about reform for signaling reasons.

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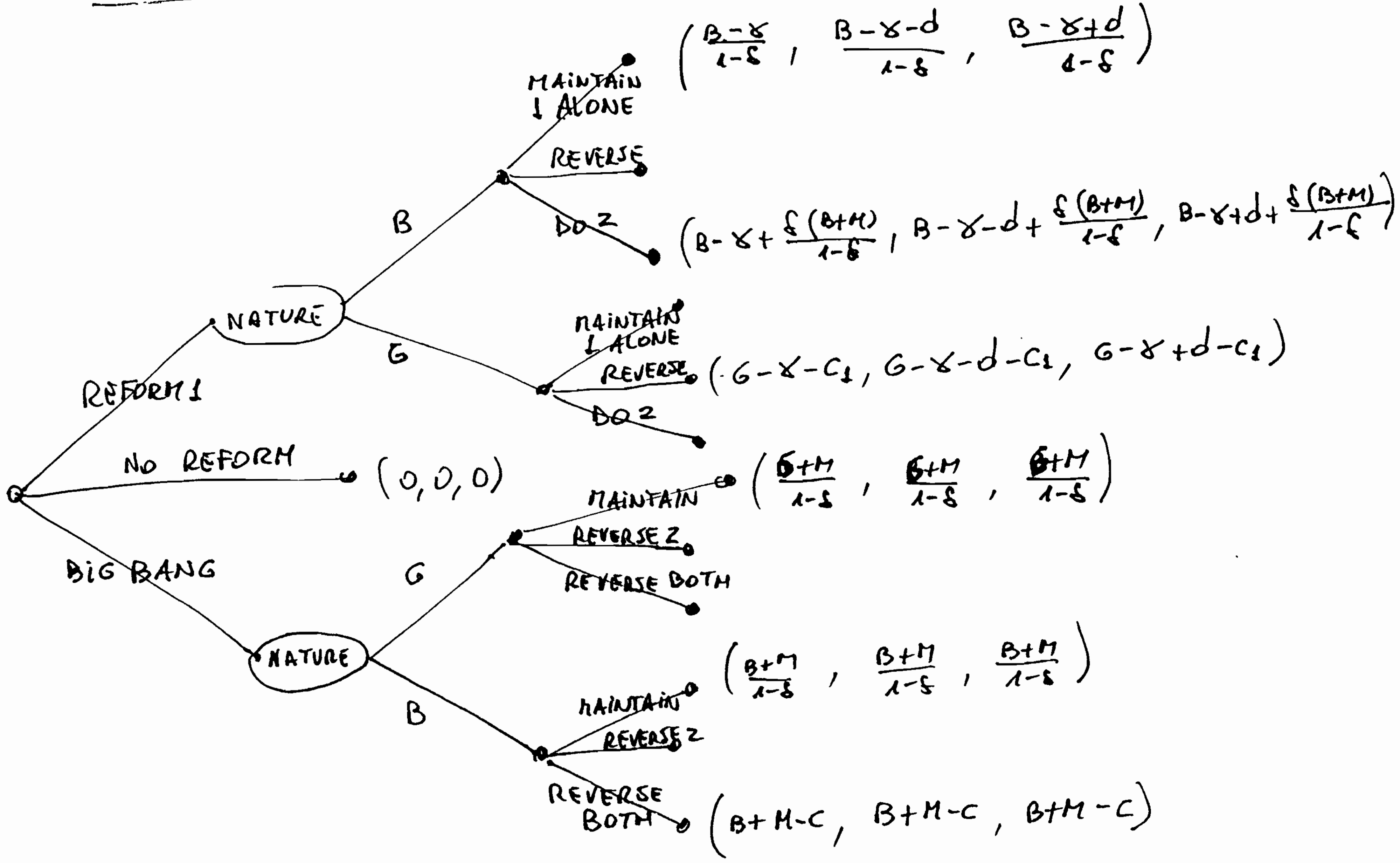
FIGURE 1



REFORM 1
NO REFORM
BIG BANG
NATURE
NATURE
B
G
G
B
MAINTAIN 1 ALONE
REVERSE
DO 2
MAINTAIN 1 ALONE
REVERSE
DO 2
MAINTAIN
REVERSE 2
REVERSE BOTH
MAINTAIN
REVERSE 2
REVERSE BOTH
$\left(\frac{B-\gamma}{1-\delta}, \frac{B-\gamma-d}{1-\delta}, \frac{B-\gamma+d}{1-\delta}\right)$
$\left(B-\gamma+\frac{\delta(B+M)}{1-\delta}, B-\gamma-d+\frac{\delta(B+M)}{1-\delta}, B-\gamma+d+\frac{\delta(B+M)}{1-\delta}\right)$
$(G-\gamma-C_1, G-\gamma-d-C_1, G-\gamma+d-C_1)$
$(0, 0, 0)$
$\left(\frac{B+M}{1-\delta}, \frac{B+M}{1-\delta}, \frac{B+M}{1-\delta}\right)$
$\left(\frac{B+M}{1-\delta}, \frac{B+M}{1-\delta}, \frac{B+M}{1-\delta}\right)$
$(B+M-C, B+M-C, B+M-C)$

FIGURE 2

$(\Pi = \frac{1}{2}, \quad \delta = 1, \quad M = 1)$