5. LAX FINANCIAL REGULATION AS ENDOGENOUS VARIABLE: THE MODEL

Now we can try to design analytically the key elements of our approach. In defining the optimal characteristics of financial regulation aimed at promoting an influx of hidden funds into a given country, we focus on the actions of a national policymaker in what we shall call a Lax Financial Regulation (LFR) country.

Let us assume that this Policymaker is aware that a potential demand for money laundering exists on the part of one or more criminal or terrorist organisations for a total amount equal to *W*. We analyse a situation in which the international market of money laundering is demand drive, as it is likely to be in the real world; every potential LFR jurisdiction is a relatively "small country". Each LFR country can define the optimal degree of financial laxity, and then determine the own optimal level of money laundering services supply. The design of financial regulation represent the contractual devise that determine the interrelationships between the country and the illegal organisations[43].

The Policymaker can decide to launder an amount of cash equal to *Y*, where of course $0<Y<W$. In our simple model the decision on the optimal level of money laundering services is equivalent to the choice of the optimal degree of financial laxity.

Calling *U* the utility function of the Policymaker , it is obvious that the expected utility from unlaundered profits is zero, whatever their amount:

$$U(W-Y)=0 \qquad (1)$$

On the other hand, every dollar (or euro?)[44] laundered can have a positive expected value for the Policymaker , since the LFR country can derives benefits from offering financial services that facilitate money laundering. In the preceding paragraphs we showed how a country can derive economic advantages from favouring money laundering. For example, one might hypothesise that the *lower* the national income and the *higher* the proportion of that income that depends on the financial industry, the greater will be the propensity to offer money laundering services, all other things being equal. In general let us define those expected national benefits as *laxity benefits.*

Then the fact that the laundered cash, which we shall indicate with *Y*, has a positive expected profitability for the Policymaker may be grasped by imagining that the monetary value *B* of this benefit is equal to:

$$B=mY \qquad (2)$$

where $m>0$ is the expected net rate of return on the money laundering services offered (i.e. on the degree of laxity) by the LFR country. The inflow of black and grey foreign capital

[43] In the model the policymaker choice of the optimal degree of financial laxity is assumed to be equivalent to the decision on the optimal supply level of money laundering financial services. An alternative view should be to consider the degree of regulation laxity one of the possible instrumental variables in order to define the optimal supply of money laundering services; it's a matter of fact however that the link between the money laundering supply and other kind of public policies seem to be logically and empirically more weak. Furthermore, should be easy to model the relationship between laxity and money laundering, considering both random effects and lag effects.

[44] For the use of dollar or Euro in the black economy see BOESCHOTEN and FASE (1992), ROGOFF (1997), SINN and WESTERMANN (2001).

produces national revenues, increasing the activity of the financial industry and then throughout the traditional macroeconomic multiplier effects[45].

If, now, the decision to launder were cost-free, indicating with *Y* the amount of illegal funds for which the Policymaker institutes the money-laundering service, it is a simple matter to see that we shall have *Y* = *W*. But things are not that simple.

In the first place, an LFR country may be subject to *international reputation expected costs*. In the preceding paragraphs we stressed that to be more attractive to criminal or terrorist organisations, a country must make legislative and regulatory choices that increase its credibility as an LFR country. These choices may carry a reputation cost, however, since it cannot be excluded that being an LFR country can cause negative kickbacks, whether in relations with capital, intermediaries and companies sensitive to integrity or with international relations in general. In fact, we have tostress the possibility that under-regulation may be as unattractive for some legal investors as over-regulation[46].

Secondly, an LFR country must consider that laundering money means strengthening inside organised crime or terrorism, i.e. there may be *crime & terrorism expected national costs*. The Policymaker must first consider the possibility that domestic social damage may derive from the fact that the country is a possible growth engine for criminal organisations. It is obvious, on the other hand, that the less the LFR country registers the actual or potential presence of criminal or terrorist organisations internally, the lower the costs of crime will be perceived.

In our framework we do not separate the crime expected costs from the terrorist expected costs. From the theoretical point of view, we prefer to stress the Policymaker different sensibility between international expected costs and national expected costs, based on a clear cut different political cost - benefits analysis, that characterised every LFR country. Furthermore, for each LFR country, it should be not difficult to introduce in the expression (3) a specific parameter for each national expected cost factor.

The cost *C* of offering money laundering for an LFR country will therefore consist of two parts.

First, let us assume that the reputation cost is proportional—according to a parameter $c > 0$—to the amount of cash it is asked to launder. Secondly, there will be a crime or terrorist cost whose expected value rises as the laundered money increases, for a multiple of the parameter $\gamma>0$. Let us assume, that is, that for political-electoral reasons the Policymaker of the LFR country, all other things being equal, is more sensitive to the crime and/ore terrorist cost, which can weigh directly on the country's citizens, than to the reputation cost, whose effect on the citizens-voters is probably less perceptible and direct. We therefore have:

$$C = cY + g^2 Y \qquad (3)$$

[45] For a macroeconomic analysis of the interrelationships between money laundering, legal and illegal economic sectors see MASCIANDARO (2000).

[46] The inflow of legal capital can be assumed as negatively correlated with financial laxity, because of two main effects: a competition effect: in the legal financial sector, competition is distorted and the allocative efficiency of the market is undermined because of extreme financial laxity; a reputation effect: legal customers may fear to suffer a loss of reputation from locating their business in a country highly suspected for money laundering.

Lastly, we must consider, as pointed out earlier, that being an LFR country is an increasing source of economic, political and social risk for the international community. Therefore, when a country decides whether and to what extent to institute a regulatory design that will in essence offer money laundering services, it must consider that this activity is risky, since we assume that the international community might consider it a censurable policy, perhaps even prohibited, and as such subject to sanctions and punitive countermeasures.

Let us assume, therefore, that offering money laundering services can bring with it an international sanction, whose equivalent monetary value is S, and a probability p that this conduct will be discovered by the international community and thus sanctioned. The probability p can be defined as the *degree of technical enforcement* of the international sanction. Let us call these risks the *international sanction expected costs*. In this manner we are able to consider in our model the possibility that the international community define explicit sanction against the LFR country.

The monetary value of the damage from sanctions S against the money-laundering must be at least equal to the value Y of the laundered money. In reality, the damage from a sanction is certainly a multiple, because of the value of the intangible damages related to such a international sanction. So we can assume that the amount of the international sanction is a multiple of the “laundry” volume, equal, for simplicity of computation, to the square of that sum.

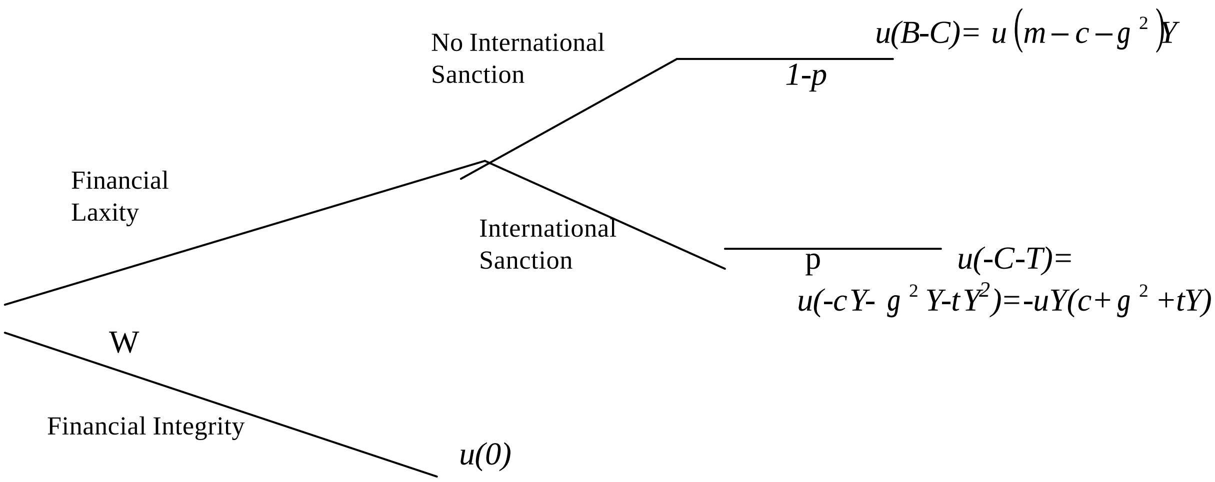
And we should also consider that once the crime is discovered, the international community would apply the sanction with a varying degree of severity, due to a political cost-benefit analysis. The rapidity and procedure for applying the punishment may be variable, affected by national or international structural variables; this *severity* (or, if you want, *the degree of political enforcement*)[47] with which the sanction is applied can be expressed by variations in the parameter t:

$$S = tY^2 \quad (4)$$

Thus the dilemma of choice facing the Policymaker is the following: if I design lax regulations that favour the offering of money laundering, and the international community does not sanction it, the benefit for the LFR country is positive, net of the expected cost associated with reputation costs and crime and terrorism risks. If, on the other hand, the LFR country is hit by an explicit international sanction, it will not only sustain the expected costs but will also be damaged by the international sanction. The game is between the Policymaker and the Nature, given that we will assume the "small country" hyphotesis.

[47] Rider (2002) noted that the monetary policy international policy is susceptible to political considerations.

Graphically:



Having defined the terms of the problem, the Policymaker is thus faced with the problem of deciding whether and how much to launder, i.e. defining the optimal level of laxity. The optimal policy is not derived by any social utility function, but it is the result of the Policymaker' maximising process, based on his own political cost-benefits analysis. The Policymaker 's expected utility E can now be better specified as:

$$E(U) = u[(1-p)(B-C) - p(C+T)] \qquad (5)$$

But since we have define $B = m\,Y$ and $C = c\,Y + g^2\,Y$ then 5) becomes:

$$E(U) = u(1-p)\{mY - cY - g^2Y\} - up(cY + g^2Y + tY^2) \qquad (6)$$

The linear specification of the function of Policymaker utility tells us that it is a neutral risk subject. This utility function is consistent with the better economic characteristics in this situation. In fact:

$$\frac{\partial E}{\partial p} = u[-Y + cY + g^2Y - (cY + tY^2 + g^2Y)] = uY(-tY - m) = -uY(tY + m) < 0$$

$$\frac{\partial E}{\partial t} = -upY^2 < 0$$

$$\frac{\partial E}{\partial m} = u(1-p)Y > 0$$

In other words, we find that the utility for the Policymaker , and therefore for the FLR country, declines as the probability of an international sanction and its severity increase, while it increases as the expected return on the money laundering activity increases.

The Policymaker must now determine the optimal level *Y** of money to launder, bearing in mind that the maximum resources available to him, given the potential demand expressed by the criminal or terrorist organisations, amounts to *W*. Deriving (6) twice for that variable subject to the Policymaker 's decision—to observe the conditions necessary and sufficient for a maximum—we find that:

$$\frac{\partial E}{\partial Y} = u\left[(1-p)\left(m-c-g^{2}\right)-pc-2tpY-pg^{2}\right] = u\left[(1-p)m-c-g^{2}+cp-cp-2tpY\right] =$$

$$-u\left(2ptY+c+g^{2}-m(1-p)\right)$$

$$\frac{\partial^2 E}{\partial Y} = -2upt < 0$$

PROPOSITION ONE*: it's possible to define the optimal level of laxity.* The function reaches its maximum at the point

$$\frac{\partial E}{\partial Y} = 0$$

i.e.:

$$\left(2ptY+c+g^{2}-m(1-p)\right)=0$$

which gives us:

$$Y^* = \frac{m(1-p)-c-g^{2}}{2pt}$$

Y* represents the optimal level of money laundering supply services, that is equivalent to the optimal degree of financial laxity. Let us observe that for $Y^* > 0$ it must be $m(1-p)-c-g^{2} > 0$, i.e. the factor of expected benefit from the money-laundering activity, considering the probability of an international sanction, is greater than the sum of the reputation and crime and terrorism cost factors. Let us define this condition as *laxity condition*.

It is also possible to define the critical value *Y'*, that marks the limit beyond which it is definitely optimal for the Policymaker to abstain from offering money-laundering services. Over a certain amount the damage associated with the risk of being punished by the international community is so high that the expected utility is negative, so being an FLR country would not be beneficial. All other conditions being equal, this result depends on the fact that the amount of the sanction is a multiple of the cash to be laundered, so as this value rises the damage from detection of the crime rises more than proportionately. In general this result stresses the importance to have an effective design of the international mechanisms of sanctions.

The critical value Y' must, of course, be compared with the level of potential demand for resources to launder W. If $Y' < W$, the amount of resources ($W - Y'$) will be excluded *a priori* by any laundering decision. If, on the other hand, $Y' > W$, laundering is potentially advantageous for all the available illegal resources; we must then determine the actual optimal level Y^*.

Let us see to what value Y' corresponds:

$$E(U) = u\left[(1-p)\left\{(1+r)Y - cY - g^2Y\right\} - p\left(cY + g^2Y + tY^2\right)\right]$$

$$E(U) = uY\left[(1-p)\left(m - c - g^2\right) - cp - pg^2 - tpY\right]$$

$Y=0$

therefore $E(U)=0$ when

$$Y' = \frac{\left[(1-p)\left(m-c-g^2\right)\right] - cp - pg^2}{tp} = \frac{(1-p)m - c - g^2 + g^2p - g^2p + cp - cp}{tp} = \frac{(1-p)m - c - g^2}{tp}$$

We can evidence the relationships with the structural variables of the model for the optimal level of laxity. Firstly, the optimal offering of money-laundering will be inversely proportional to the probability of international sanctions:

$$Y^* = \frac{m(1-p) - c - g^2}{2pt} = \frac{1}{2}Y'$$

$$\frac{\partial Y^*}{\partial p} = \frac{-2mpt - 2t\left[(1-p)m - c - g^2\right]}{(2pt)^2} = \frac{-2mpt - 2tm + 2ptm + 2ct + 2tg^2}{(2pt)^2} = \frac{-2tm + 2ct + 2tg^2}{(2pt)^2} =$$

$$= \frac{\left(c + g^2 - m\right)}{2p^2t} < 0$$

$$\frac{\partial^2 Y^*}{\partial p} = \frac{-4pt\left(c + g^2 - m\right)}{4p^4t^2} = \frac{m - c - g^2}{p^3t} > 0$$

Therefore, since we have assumed $m > c+g\omega^2$, we find that the first derivative is negative, so the function decreases as the probability of detection increases and the concavity faces upward. i.e. the second derivative is greater than zero. This means that

PROPOSITION TWO*: the optimal degree of laxity increases as the degree of technical enforcement decreases.*

Y* (p) =0, i.e. it intersects the x-axis at point:

$$Y^* = \frac{m(1-p)-c-g^2}{2pt} = 0$$ which means:

$$(1-p)m-c-g^2 = 0 \quad \Rightarrow m-pm-c-g^2 = 0 \Rightarrow p = \frac{m-c-g^2}{m}$$

and we can also say that for

$$p \to 0 \qquad Y^* \to +\infty \qquad\qquad p \to 1 \qquad Y^* \to \frac{-c-g^2}{2t}$$

As expected, when there are no costs for the LFR country related to its laxity (i.e. $c+g\omega^2 = 0$), that country will abstain from offering money-laundering services (Y*=0) only when the international sanction is absolutely certain (p=1).

As p tends toward zero, the optimal level of laxity for the Policymaker tends to $Y^* \to +\infty$, but the Policymaker has available a maximum demand of W, so it must stop with the curve on the probability level at the point where $Y^* = W$.

Let us then find the minimum possible value p can take (p_m), i.e. at the point where $Y^* = W$:

$$Y^* = \frac{m(1-p_m)-c-g^2}{2p_m t} = W$$

$$m-p_m m-c-g^2 = 2Wp_m t \qquad \Rightarrow 2Wp_m t + p_m m = m-c-g^2$$

$$\Rightarrow p_m(2Wt+m) = m-c-g^2$$

$$\Rightarrow p_m = \frac{m-c-g^2}{2Wt+m}$$

Secondly, the laxity of the LFR country is affected by the severity of the international community in applying the sanction:

PROPOSITION THREE*: the optimal degree of laxity increases as the level of political enforcement decreases.*

$$Y^* = \frac{m(1-p)-c-g^2}{2pt} =$$

$$\frac{\partial Y^*}{\partial t} = \frac{-2p\left[m(1-p)-c-g^2\right]}{4p^2t^2} < 0$$

Therefore Y^* decreases as t increases. When t tends to $+\infty$ the first derivative is nullified.

What we said about the case where $p = p_m$ also applies here. If, in fact, t tends to zero, we see that Y^* tends to $+\infty$. But this is not possible, because the maximum level of illegal funds potentially launderable available to the Policymaker is W. Therefore we must also find the minimum value of t (t_m) at which $Y^* = W$;

$$Y^* = \frac{m(1-p)-c-g^2}{2pt} = W$$

$$\frac{m(1-p)-c-g^2}{2pt_m} = W \quad \Rightarrow m(1-p)-c-g^2 = 2Wpt_m \quad \Rightarrow t_m = \frac{m(1-p)-c-g^2}{2Wp}$$

The laxity of the LFR country will depend also on the profitability of offering money-laundering services.

PROPOSITION FOUR*: the optimal degree of laxity increases as the level of national benefits increases.*

$$Y^* = \frac{m(1-p)-c-g^2}{2pt}$$ It is a function of the type Y = a x + b where $a = \frac{1-p}{2pt}$ and $b = \frac{-c-g^2}{2pt}$

$$\frac{\partial Y^*}{\partial m} = \frac{(1-p)}{2pt} > 0$$

$$Y^* = \frac{m(1-p) - c - g^2}{2pt} = 0 \qquad \Rightarrow m(1-p) - c - g^2 = 0 \qquad \Rightarrow m = \frac{c + g^2}{(1-p)}$$

$$Y^* = \frac{m_{\max}(1-p) - c - g^2}{2pt} = W$$

$$m_{\max} = \frac{2Wpt + c + g^2}{(1-p)}$$

The money-laundering will therefore be non-zero if the profitability lies in the range $]m_m, m_{\max}]$.

Finally, we can then analyse the relationship between the reputation cost of money-laundering operations and the amount of money to be laundered .

PROPOSITION FIVE*: the optimal degree of laxity increases as the level of international reputation costs decreases.*

As we might expect, the relationship is inverse and equal to:

$$Y^* = \frac{m(1-p) - c - g^2}{2pt}$$ Y*(c) is a straight line of the type Y = -ax+b

If the reputation cost is extremely high, then *Y* = 0*. Let us see for what value of *c*

$$Y^* = \frac{m(1-p) - c_{\max} - g^2}{2pt} = 0 \qquad \Rightarrow \frac{m(1-p) - c_{\max} - g^2}{2pt} = 0$$

$$\Rightarrow m(1-p) - c_{\max} - g^2 = 0$$

$$\Rightarrow c_{\max} = m(1-p) - g^2$$

$$\frac{\partial Y^*}{\partial c} = \frac{-1}{2pt} < 0$$

$$Y^* = \frac{m(1-p) - c - g^2}{2pt} = W$$

$$\frac{m(1-p)-c_m-g^2}{2pt}=W \qquad \Rightarrow m(1-p)-c_m-g^2=2Wpt$$

$$\Rightarrow c_m=m(1-p)-g^2-2Wpt$$

Lastly, the money-laundering activity of the LFR country will also depend on the expected crime and terrorism costs, summarised by the parameter g:

PROPOSITION SIX*: the optimal degree of laxity increases as the level of national crime and terrorism costs decreases.*

$$Y^*=\frac{m(1-p)-c-g^2}{2pt} \qquad Y^*=\frac{m(1-p)-c-g^2}{2pt}=0 \Rightarrow g_{\max}=\sqrt{[m(1-p)-c]}$$

$$\frac{\partial Y^*}{\partial g}=\frac{-g}{pt}<0$$

$$\frac{\partial^2 Y^*}{\partial g}=\frac{-1}{pt}<0 \qquad \text{if } g=0 \Rightarrow Y^*=\frac{m(1-p)-c}{2pt}$$

As the criminal and terrorism risks for its citizens increase, the propensity of the FLR country to offer money-laundering services decreases. As usual, we can also determine the maximum and minimum values of the parameter g, to which the minimum and maximum of the optimal laundering activity instituted by the Policymaker correspond:

$$Y^*=\frac{m(1-p)-c-g^2}{2pt}=W \Rightarrow m(1-p)-c-g^2=2Wpt \Rightarrow g^2=m(1-p)-c-2Wpt$$

$$\Rightarrow g_{\min}=\sqrt{[m(1-p)-c-2Wpt]}$$