last weeks of the fiscal year[3]. This common practice[4], far from being banished, has been accepted as unavoidable. Furthermore, some budgeting regulations impose sanctions to BSOs who are not successful in executing their entire budget in a fiscal year; however, they do not prohibit it[5]. Moreover, it is a common belief that if a BSO does not execute his entire budget in one year, it is either because he was not effective enough to execute entirely his budget or, because he received more money than needed. Hence, in any of those situations[6], such BSO will be obliged to return that surplus to the Treasury[7] and a *budget-cut-for-the-next-year* threat may arise in his future[8]. Thus, they rather apply the *spending-all-practice* (SAP), despite of its inefficiency.

The SAP does not only lead to inefficient spending. It is also a source for incremental budgeting[9]. When this happens, usually the budget negotiation

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[3] *See* Wildavsky, A. (1979), *supra note 2,* at p. 31.

[4] As from now, I will refer to that *spending-all-at-the-last-minute* practice, as the *"spending-all-practice"*.

[5] *See Ley Federal de Presupuesto y Responsabilidad Hacendaria* (2006) Mexico, As. 2-III, 2-X, 2-LII, 114-IX. The law differentiates expenditures that are not excecuted during the fiscal year, in two: *"Ahorros Prespuestarios"* –budgetary savings- and *"Subejercicios"* –under-expenditures–.The former are the remaining surplus once the budgetary goals and objectives are achieved; while the latter are the remaining surplus when those goals and objectives are not achieved. Hence, the law imposes sanctions on the BSOs who incur in *subejercicios* and, in the other hand, allows to those who attain *ahorros presupuestarios,* to reallocate such surplus in other spending priorities. *See also: Reglamento de la Ley Federal de Presupuesto y Responsabilidad Hacendaria* (2006) Mexico, A. 214.

[6] For simplicity, I will refer to these situations as the "*ineffective manager notion"* and the *"budget-cut-for-the-next-year threat"*.

[7] *See:* Wildavsky, A. (1979), *supra note 2,* at p. 31.

See also, for example Ley Federal de Presupuesto y Responsabilidad Hacendaria (2006), *supra note 5*, at As. 26-IV, 54.

Reglamento de la Ley Federal de Presupuesto y Responsabilidad Hacendaria (2006), *supra note 5,* at A. 12, Cap. II.'Ley 47/2003, de 26 de noviembre, General Presupuestaria' (2003) *Boletín Oficial del Estado,* 284, pp. 42079-42126, Spain, november 27th, A. 86:2: Quinta.

[8] *See Wildavsky, A. (1979), supra note 2, at p. 31.*

[9] For an elaboration on the concept of incremental budgeting, see Wildavsky, A. (1979), *supra note 2,* at pp. 135-145.

For critics to incremental budgeting, directed to its descriptive and prescriptive features, see Peters, B. (1989) *The Politics of Bureaucracy,* Third Edition, White Plains NY: Longman, p.225-228. Further, the author notes incremental budgeting *'may perpetuate small mistakes'* (p. 225). He also argues that, according to Wildavsky, *'incrementalism is peculiar to the budgetary environment of relatively few affluent countries'* (p. 224). However, he replies, *'(…) despite the special conditions in which incrementalism is argued to arise, It has become something of a prevailing description of the budgetary process for all countries'*, pp. 224, 225). Moreover, he gives other sources for incremental budgeting *–pressures towards incrementalism–* (pp. 226-228).

Also, see Wildavsky, A. (1992) *The New Politics of the Budgetary Process,* New York: Harpers Collins Publishers, pp.82-85, where he notes that *'most of each budget is a product of previous*

The main implication of the I-WILL-DO-MY-BEST RULE is that no matter what the EiL are in t, T1 will only have to care about taking the required measures to raise his Lε, so he will not suffer any budget cuts.

3.4.4.4.1. The SAP and the budget cut due to inefficiency losses

As it was mentioned, one of the reasons that BSOs have to follow the SAP is to avoid the *budget-cut-for-the-next-year-threat*. However, the I-WILL-DO-MY-BEST RULE states that there will be no budget cuts for β_{t+1}, as long as T1 take measures to improve efficiency during *t*. Hence, the threat vanishes, even if T1 does not execute β_t entirely. In addition, by avoiding the SAP, it is likely that iL would decrease, since such practice is highly inefficient.

Moreover, one of the measures that may improve efficiency could be to eliminate the SAP.

Furthermore, if not only the threat vanishes, but also T1 could add the savings he achieves at year *t*, if any, to β_{t+1}, he would clearly have a strong incentive to be more efficient. However, he cannot.

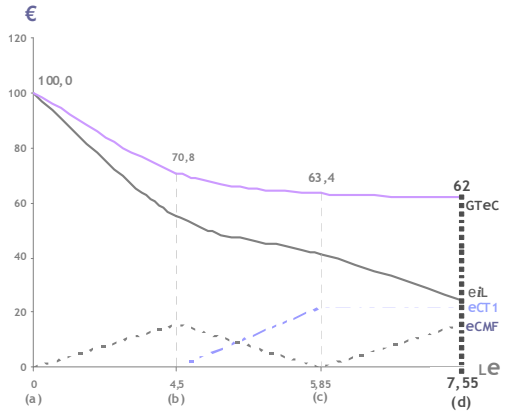
3.4.4.4.2. Strategies for T1 and MF, when I-WILL-DO-MY-BEST RULE applies

Figure 3 and Graph 4 show T1's and the MF's costs matrix and the resultant GTeC, in accordance with Table 2, once the I-WILL-DO-MY-BEST RULE applies.

FIGURE 3 AND GRAPH 4

FIGURE 3. COSTS MATRIX FOR T1 AND MF IF THE I WILL DO MY BEST RULE APPLIES.

T1 \ MF	NO	YES
NO	100,0 / 0,0	55,0 / 15,8
YES	21,9 / 41,5	21,9 / 40,3



GRAPH 4. GTEC WHEN THE-I WILL DO-MY BEST RULE IS APPLIED TO T1.

T1 has also, in this case, a dominant strategy: YES. He will always be better off –as long as $(iL_{(a)} - iL_{(c)}) > \varepsilon C_{T1}$– if he raises his Lε by taking measures that improve efficiency. That places all *i*L burdens on the MF. In such case, T1 would only have to pay his own εC. Thus, instead of facing a loss of 100 if, for instance, the MF does not take any measures, or a loss of 55 if it does, he would only have to face costs of 21,9 in any case. Thus, his losses would drop then by 78,1 or 33,1, respectively.

The MF strategy under this assumption is not dominant. In this case, its decision depends on T1's. If T1 decides NO, the MF would be better off by choosing NO as well. In this case, all *i*L would be charged to T1 and hence, there would be no point for the MF to spend a cent in εC. However, if T1 chooses YES, the MF would then have to take efficiency measures to minimise *i*L, since under this conditions, all losses would be charged to its budget.

Now, since both players are rational and have perfect information according to Assumption [A2]:, the MF knows that T1 will choose YES –his dominant strategy–. As a result, the MF should choose YES as well. Therefore, with the I-WILL-DO-MY-BEST RULE, a YES–YES solution is achieved and the εPE_{op} is attained. Thus, the outcome of the *game* is the optimum solution shown in Graph 4. It is:

(Df55) $x = 7{,}55$ and $GTeC = 62{,}3$, that corresponds to Lε: (d).

3.4.4.4.3. Outcome of the game regarding (P1) and (P2)

Applying (Df6) and (Df7) to (Df54):

(Df56) $| GTeC_{op} - GTeC_{T1\text{-}P+} | = | 62{,}3 - 62{,}3 | = 0$

Hence:

(Df57) $\Delta\varepsilon PE_{T1\text{-}P+} = 0$

3.4.5. *T2'S level of efficiency in public expenditure (εPE_{T2})*

It is now time to analyse T2's expected behaviour regarding the three BNRs described. As we did with T1, assume the following:

(S.A.6.) The MF approves T2's budget β every time he signs a new contract with the government, which is every other year. His β is distributed in years *t* and *t+1* as follows: $\beta_t = 0{,}5\beta$ in year *t*, and $\beta_{t+1} = \beta - \beta_t$, in year *t+1* [107].

(S.A.7.) The MF calculates the optimum level of efficiency ($L\varepsilon_{Op}$) for T2. It is reached when GTeC are minimised.

(S.A.8.) T2 and the MF can take two actions only: (YES), to comply with the $L\varepsilon_{Op}$ set by the latter by paying εC, and: (NO), not to comply with the $L\varepsilon_{Op}$.

(S.A.9.) There are only two Lε: Lε(a) where $y = 0$ and no efficiency measures are taken at all ($\varepsilon C = 0$); and $L\varepsilon_{Op}$, where εPE_{op} is achieved when both pay εC ($\varepsilon C > 0$).

[107] For simplicity, we only consider one two-year-contract. Then, there will only be one two-year budget *β* and one budget negotiation process between the MF and T2.

(S.A.10.) Thus, there are four possible combinations for T2's and the MF's actions: (NO–NO), (NO–YES), (YES–NO), and, (YES–YES).

(S.A.11.) Finally: $T\rho = 10$, $iL = 100$, $n = 36$, $r = 90$, and $pr = 25$.

These initial *rules of the game* for T2 are quite the same as T1's. However, there are a few differences. Three of them are pointed up.

The first one is related to Assumption [A15], Section 3.4.2. It states that T2 incurs in larger εC than T1 ($\varepsilon C_{T2} > \varepsilon C_{T1}$), because his *Framework* is more flexible, so that allows him to do more changes than T1. T2 has then more autonomy to decide what improvements he should make and to what extent take them. Then, it could be expected that T2 would do more and hence will spend more in εC, than T1. Therefore, T1's $\varepsilon C_{T1} = 21{,}9$ ($m = 65$), and T2's $\varepsilon C_{T2} = 25$ ($n = 36$). The second is a difference in the term's length for both BSOs' budgets: T2's β is approved every other year, whilst T1's is approved annually[108].

The third one[109] is related to how they distribute their budgets: T2 distributes his budget in two years as he decides, in accordance with his needs. T1 executes his entire budget annually. Then, T2's β_{t+1} would not necessarily be half his budget for both years. Only β_t is equal to half the budget the MF approves at the beginning of year *t* ($\beta_t = 0{,}5\beta$); but β_{t+1} is equal to the total budget β for both years minus the executed β_t, so β_{t+1} will be equal to the remaining budget T2 has, after year *t*[110].

These last two differences –*the budget-length incentive* and *the budget-distribution* incentive– have many implications for this analysis. Moreover, they result in an additional –and key– assumption for T2. We revise these implications and elaborate such assumption next.

3.4.5.1. An additional assumption for T2

Both differences as well as an argument that was elaborated earlier will help us to build the additional assumption for T2.

First, following the *budget-length incentive*, we have that the MF approves T2's β only once: when they sign T2's two-year-contract. However, T2 receives half his β in year *t* (β_t) and, presumably, the other half in year *t+1* (β_{t+1}).

However, T2 can execute his β as he decides. Then, if he does not spend β_t entirely during t, he can keep the remaining sum and would be able to spend it along with β_{t+1}, during *t+1*. Further, if at the end of *t+1*, T2 complies with his contract –i.e.: he produces all the *outputs* the MF stated in his contract– and there still are some savings, T2 can keep them as some sort of utilities.

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[108] As from now, we will refer to this difference as: the *budget-length incentive*.

[109] Accordingly, we will refer to this difference as: the *budget-distribution incentive*.

[110] Thus, if $\beta_t > 0{,}5\beta$, then $\beta_{t+1} < 0{,}5\beta$; if $\beta_t = 0{,}5\beta$, then $\beta_{t+1} = 0{,}5\beta$; and, if $\beta_t < 0{,}5\beta$, then $\beta_{t+1} > 0{,}5\beta$.

In addition, regarding the *budget-distribution incentive*, we should recall from Section 1 that the main inefficiency source in public expenditure that we are analysing is the SAP. Moreover, it was said that T1 follows such practice because of three main reasons: the *budget-cut-for-the-next-year-threat*, the *ineffective-manager-notion*, and, mainly, because he gains nothing if he achieves any savings in t, due to an improvement in his level of efficiency –he lacks the *keep-your-saving-possibility*–. However, T2 only worries about the *ineffective-manager-notion*. Since his β is approved only once because of the *budget-length incentive*, he does not face the *budget-cut-for-the-next-year-threat*. Furthermore if he complies with his contract, the *budget-distribution incentive* allows him to *keep his savings* at all times –at the end of *t*, so he will use them in $t+1$ or, at the end of $t+1$ as utilities–. Then, the larger the savings he achieves, the greater his utilities will be, if he complies with his contract.

Clearly, T2 has two major incentives that T1 does not, regardless the BNR the MF applies to him. On one hand, he will not face a *budget cut threat* –the *budget-length incentive*– ever. On the other, he will be able to *keep his savings* at all times if he complies with his contract –the *budget-distribution incentive*–.

Thus, one question T2 probably could ask himself would be, *how could I use both incentives to generate larger savings, and at the same time, to produce or provide, with the same quality, the amount of goods or services I am obliged to, by contract?* The answer could be, *by being more productively efficient*. If T2 manages to raise his Lε, he presumably will face fewer costs and will have more savings; hence, he will achieve more gains and a greater utility. Nevertheless, would that be so? Could it be said then that T2 is interested in applying further measures to enhance his Lε, even if that implies to spend part of his β in εC[111]? Further, how would those two incentives –the *budget-length* and the *budget-distribution*– could be used to attain such goal?

3.4.5.1.1. The Cost-Internalisation-Effect (cie)

To answer that, we need to recall first that the I DON´T CARE RULE implies that no BSO should care about efficiency at all, since all *i*L that could arise would be paid by the MF. Then, it would seem that it has no sense for T2 to spend any sum in εC. In other words, it could be said that T2 would not be willing to pay any εC, just as T1 does. Moreover, we could ask, why would it be good for T2 to pay any εC at all? Would it be a smart thing to do? It might be so. Indeed, the *budget-distribution incentive* may be the reason for so. To find it out, we have to compare the Ei*L* that may arise when T2 decides not to take

[111] A further assumption has to be made here. T2's β_t is the exact sum he needs to produce the total number of outputs (Tρ) that he is obliged to by contract, during *t*. So, no additional expenditures are considered in β_t. Therefore, if he generates EiL or pays εC in *t*, he will be *overspending in t*. Thus, it could be assumed that T2 's overspending in *t* would be due only to two kinds of expenditure: his εC –if any– and the EiL that arise in that year.

any measures to improve efficiency, with those when he decides the contrary. If he is able to reduce the E*i*L to such an extent that it would make him better off –i.e.: if he attains *larger gains* or *lower losses*–, he should then pay the εC.

For that, the *budget-distribution incentive* could be useful. However, it should be point up that as a consequence of this *incentive*, any εC (and any EiL) that arise in t generates an *overspending in* t (β_t would be then: $\beta_t = 0{,}5\beta +$ *overspending in* t). So, larger εC and EiL in *t* mean larger *overspending in* t. Larger *overspending in* t results in a reduced β_{t+1} ($\beta_{t+1} = 0{,}5\beta -$ *overspending in* t). Thus, the less εC and EiL are in *t* the better it is for T2, since the less β_{t+1} will be affected. Then, T2 should pay εC only if the resultant outcome leads to lesser E*i*L. Since by assumption there are only four possible outcomes, this should be simple. What we have to do is to compare only the two pairs of outcomes where the decision is on T2. Table 3[112] recalls these four outcomes:

Table 3

FOUR POSSIBLE OUTCOMES OF THE GAME BETWEEN T2 AND MF AND THEIR EFFECTS IN EIL

FOUR POSSIBLE AND THEIR EFFECTS IN EIL			
Outcome	**T2**	**MF**	**EIL**
(a)	NO	NO	100
(b)	NO	YES	55
(c)	YES	NO	40
(d)	YES	YES	25

The two pairs of outcomes where the decision is only on T2 are: (a) with (c), and (b) with (d). In (a) and (c) the MF chooses always NO to take measures to improve εPE. On the contrary, in (b) and (d) the MF chooses YES all the time. Then (a) has to be compared with (c), and (b) with (d), because in these two cases T2's decision makes the difference. Table 4 shows the four outcomes re-arranged.

Table 4

RE-ARRANGING THE FOUR POSSIBLE OUTCOMES

RE-ARRANGING THE FOUR OUTCOMES			
Outcome	**MF**	**T2**	**EIL**
(a) & (c)	NO	NO	100
		YES	40
(b) & (d)	YES	NO	55
		YES	25

[112] The resultant values of the eil for the four different outcomes shown in Table 3 are calculated in Table 5, which is in further Section 3.4.5.2.

In (a) & (c), if T2 chooses YES when the MF chose NO, there is a loss in E*i*L[113] of (–60 = 100 – 40)[114], and that is the effect that T2's decision generates. On the other hand, in (b) & (d), the effect of T2's decision is a loss of (–30 = 55–25) in E*i*L, if he chooses YES when the MF chose YES as well. I called this effect, the *Cost-Internalisation-Effect* (*cie*). It could be defined as:

(D17) *The cie is an effect T2 cause, which enhances efficiency in public expenditure. T2 generates the cie when he decides to internalise the εC he requires to take measures that improve efficiency and he does so, by taking advantage of the budget-distribution incentive.*

These εC, which generate *overspending in* t, are paid by T2 in t. The *cie* is then the difference in E*i*L that T2 causes when he decides whether he pays εC or not. Through it, T2 can generate some sort of savings in *t*, since by raising his Lε with the efficiency measures the εC pays; he reduces the costs to produce the *outputs* he has to provide. Then, with this reduction on his costs of production, it could be expected that T2 could afford his εC without incurring in any *overspending in* t.

Hence, if the *cie* is negative and large enough, T2 will be better off by choosing YES instead of NO.

3.4.5.1.2. Real Budgetary Loss (RβL) and Real Inefficiency Loss (RiL)

We found then a few advantages T2 has, due to the *budget-distribution incentive*. First, it generates the *cie*, which may allow T2 to achieve some savings[115] that he keeps at the end, if he is willing to *invest* a fraction of his β_t in εC during t. Second, it gives T2 more flexibility to manage his budget, since he will receive half of his β in year *t* ($\beta_t = 0{,}5\beta$) and the rest in year *t+1* ($\beta_{t+1} = \beta - \beta_t$).

Finally, this incentive also allows T2 to pay any εC in *t* even if he exceeds his initial $\beta_t = 0{,}5\beta$ for that year, since that will reduce the EiL he generates[116].

Then, assume that if T2 exceeds his β_t –that is, if he *overspends in* t– such overspending is financed by the MF. Consequently, the MF will discount such sum from T2's β_{t+1}[117].

Therefore, this overspending could be considered as a *Real Budgetary Loss* (RβL) for T2 in year *t+1*, since his β_{t+1} would be reduced by the same amount.

[113] Alternatively, a gain in efficiency, since less inefficiency losses can be considered as such.

[114] The EiL are reduced since the Lε has been improved by taking measures that enhance εPE.

[115] As long as: *cie* < 0.

[116] Remember that the larger the *overspending in t*, the shorter T2's β_{t+1} would be. Then, if paying εC result in less EiL, T2's *overspending in t* may be lower.

[117] So, as it was mentioned before, T2's $\beta_{t+1} = 0{,}5\beta$ - *overspending in t*.

Further, it could be seen as a *Real Inefficiency Loss* (RiL) for the MF in t, since the Ministry would then have to reallocate a sum equal to such *overspending* from other expenditure priority, to lend it to T2. Then, the MF would have a real loss in t.

However, these losses –RβL and RiL– are attenuated by the *cie*, since it produces some savings in the costs of production that can be used to pay εC and to reduce the EiL. Hence, the expected *overspending in* t would then be as follows:

(Df58) *Overspending in* t = εC_{T2} + EiL + cie[118]

Thus, the MF's RiL –that is: the sum the MF has to lend to T2 so he can pay his *overspending* in t– would be:

(Df59) RiL = εC_{T2} + EiL + cie

Then, RiL can be defined as follows:

> (D18) *RiL is the loss that the MF face in year t, due to the iL that arise then, plus the εC that T2 pays to introduce measures to improve his Lε, minus the cie those measures generate by reducing T2's production costs.*

Therefore:

(Df60) If RiL < 0, there is a *surplus* in β_t, so: β_{t+1} = 0,5β + RiL

If RiL = 0, there are no changes: β_t = 0,5β, and β_{t+1} = 0,5β

If RiL > 0, there is a *deficit* in β_t, which is financed by the MF in t and that is paid by T2 in *t+1*.

Hence: β_t = 0,5β + RiL, and β_{t+1} = 0,5β – RiL

On the other hand, T2's RβL for year *t+1* due to his *overspending* in t are:

(Df61) RβL*t+1* = εCT2 in t + EiLt + cie t, so,

(Df62) Overspending in t = RiL, and

(Df63) Overspending in t = RβL.

Then, RβL can be defined as follows:

> (D19) *RβL is a loss in T2's budget for year t+1, since it is the sum the MF discounts from T2's* β_{t+1} *due to the overspending he generated in t, which was financed by the MF in that year.*

Then, the RβL is some sort of budget cut (βcut) in T2's β_{t+1}. However, it is quite different from the *budget-cut-for-the-next-year-threat* that worries T1. Further, it is different from the budget cut that the MF may impose to T1 if

[118] The *cie* < 0.

either the I-DO-CARE RULE or the I-WILL-DO-MY-BEST RULE is enforced. On the contrary, this kind of budget cut is more the consequence of the flexibility T2 enjoys to manage his budget. It is then an effect of the *budget-distribution incentive*. Thus, the main difference is that the RβL is an *opportunity-cost* whilst the *budget-cut-threat* or the cuts proposed through the BNRs are penalties the MF imposes to T1.

Moreover, the RβL is caused by the *budget-length incentive,* which applies only to T2. Such incentive eliminates any concerns T2 may have with respect to the *cut-threat* or the *imposed-cuts*, by assuring him a multi-year budget in advance. So, the extent of the *βcut* the RβL generates is *controlled* by T2, since that cut is a consequence of the *overspending* he decides to do in year *t*. Then, we have that:

(Df64) $R\beta L = \beta cut$

Hence, it can be said that:

(D20) *The budget-distribution incentive benefits T2 with the cie, and the budget-length incentive eliminates any concern T2 may have regarding budget cuts, since he is able to adjust such cut –the βcut– by controlling his overspending.*

3.4.5.1.3. GTeC after the RβL and the RiL

In Section 3.2.4, the *government's total expected costs* were expressed in Equation (Ec8). It helped us to formulate the function j(y), which defines such costs for T2 and the MF, in the Model. We saw then that such costs were comprised by εC –from T2 and the MF– and the EiL.

Recalling 0 from that Section:

$$GTeC = \varepsilon C_{BSO} + \varepsilon C_{MF} + (\delta R(L\varepsilon) \bullet iL) \qquad \text{(Ec8)}$$

In Section 3.4.4, function j(x) –same as j(y)– was applied to T1 and to the MF. Now, we will use it with T2 and the MF. However, there are a couple of differences between T1 and T2, as it was just explained in this Section, which are crucial for this analysis. These are the *budget-distribution incentive* and the *budget-length incentive*. Thus, it is necessary to introduce these differences in the Model and, particularly in j(y).

First, applying (Ec4) we formulate a *generic* (Ec8) as follows:

$$\textit{Generic } GTeC = \varepsilon C_{BSO} + EiL + \varepsilon C_{MF} \qquad \text{(Ec9)}$$

Now, according to Definition (D20), the *budget-distribution incentive* benefits T2 with the *cie*. Also, the *budget-length incentive* gives T2 the possibility to set his second year's βcut by himself, since he decides to what extent he will overspend in t; hence, he decides by how much β_{t+1} will be reduced. Then, we can say that T2 has the chance to set his own βcut for year *t+1*, which by

definition is equal to his *overspending in* t. Thus, if we *add* both incentives to the generic GTeC we have:

$$\textit{Updated}\ \text{GTeC} = \varepsilon C_{T2} + \text{EiL} + \varepsilon C_{MF} + \text{cie} + \beta\text{cut} \qquad \text{(Ec10)}$$

That is:

$$\textit{Updated}\ \text{GTeC} = (\varepsilon C_{T2} + \text{EiL} + \text{cie}) + (\beta\text{cut}) + \varepsilon C_{MF} \qquad \text{(Ec11)}$$

Applying (D*f*60) and (D*f*62), (D*f*63), and (D*f*64):

$$\text{GTeC} = \text{RiL} + \text{R}\beta\text{L} + \varepsilon C_{MF} \qquad \text{(Ec12)}$$

Then, we have that these *updated* GTeC when T2 and the MF *play the game*, are given by (Ec12), where the two additional incentives T2 has, because of his *Framework*, are included. Also, both kinds of losses –RβL and RiL– comprise T2's εC, E*i*L and the *cie*. Finally, εC_{MF} are included as well.

It is important to keep in mind that the Model deals with expected losses, since the *game* is played at the beginning of the term –every year for T1, and once for years *t* and *t+1* for T2–[119].

In accordance, we have to define a new function j(y) for these *updated* GTeC. Recalling (Fn7) defined in Assumption [A17], Section 3.4.2., we have that:

(Fn7) j(y)= g(y)+ h(y)+ k(y), where:j(y): GTeC for T2,
g(y): T2's εC,
h(y): MF's εC, and
k(y): EiL.

Then, following (Ec11), (Ec12), and (Df62):

$$\text{GTeC} = (\varepsilon C_{T2} + \text{EiL} + \text{cie}) + (\varepsilon C_{T2} + \text{EiL} + \text{cie}) + \varepsilon C_{MF}, \qquad \text{(Ec13)}$$

So:

$$\text{GTeC} = [\,2 \bullet (\varepsilon C_{T2} + \text{EiL} + \text{cie})\,] + \varepsilon C_{MF}\text{[120]}, \qquad \text{(Ec14)}$$

Applying (Fn7) to (Ec14):

(Fn8) j(y) =2 • [g(y) + k(y) + cie]+ h(y)

3.4.5.1.4. An additional assumption for T2: A brief summary

Through this Section 3.4.5.1., it was formulated a new j(y) that measure the government's total expected costs when T2 *plays the game* along with the MF. For that, a few arguments were elaborated. Now, before we continue with the

[119] In this example, we are considering that T1, T2 and the MF will pay εC only once, if that is the case. Then, as expected, εC_{MF} in (Ec12) are the same than εC_{MF} in (Ec8). That is, the MF faces the same εC regardless the type of BSO –T1 or T2–.

[120] Since RiL = RβL, then: GTeC = RβL + RiL + εC_{MF} is equal to GTeC = 2RiL + εC_{MF}.

analysis, it would be useful to do a brief summary of those arguments and to have a definitive and final version of the *additional assumption for T2*.

(1) Two key differences between T1 and T2 where found: The latter's *Framework* gives him the *keep-your-savings possibility*, and eliminates from T2's perspective any external *budget-cut-threat* T1 may face[121].

(2) Those differences were named as the *budget-distribution incentive* and the *budget-length incentive*.

(3) These incentives affect the GTeC through the *cie* and the possible *βcut* that T2 may generate.

(4) Thus, those elements were introduced in the original function *j(y)* for the GTeC's, resulting in an updated function j(y), which is (Fn8).

Therefore, considering these arguments, the *additional assumption for T2* would be as follows:

(D21) *T2's Framework gives him two incentives that create two effects –cie and βcut–, which affect his behaviour towards εPE. Further, they affect his expected payoffs or costs at the end. Then, his attitude towards efficiency may differ from T1's.*

3.4.5.2. Differences between Table 2 and Table 5

The government's total expected costs according to T2's and the MF's levels of efficiency are as shown in Table 5.

Table 5

GOVERNMENT'S TOTAL EXPECTED COSTS ACCORDING TO T2'S AND MF'S LEVELS OF EFFICIENCY

Level of efficiency			εC	Expected inefficiency loses			cie	RβL	RiL	εC	GTeC
Outcome/Lε=y	T2	MF	T2	y=εpy	δR	Eil	T2	T2	MF	MF	
a: 0	NO	NO	0	0,0	100%	10 0	0	100	100	0	200,0
b: 4,5	NO	YES	0	4,5	55%	55	0	55	55	15,8	125,8
c: 6,0	YES	NO	25	6,0	40%	40	-60	5	5	0	10,0
d: 7,55	YES	YES	25	7,5	25%	24,5	-30,5	19	19	15,8	53,8

The *cie* and the β*cut* effects introduce the RβL and the RiL as elements required to calculate the GTeC. Such elements affect the GTeC when T2 *plays*

[121] T2 sets himself the extent of any possible budget cut he may face in his next year's budget (β_{t+1}), since he controls his overspending in the first year *t*.

the game, so these are different from those T1 generates. This is one of the differences between Table 2 –GTeC with T1– and Table 5 –GTeC with T2–.

A further difference is that T2 achieves the same level of efficiency (Lε) at points (a), (b) and (d) than T1. However, at point (c) the Lε is different.

At points (a) and (d) the Lε of efficiency for both cases is the same because (*a,d*) is the interval that was defined in Section 3.4.3. for T1 and for T2. The Lε achieved at point (b) is also the same in both tables because in such cases the efficiency improvement was accomplished by the MF. At this point, only the MF pays εC and the BSOs do nothing.

Point (c), on the contrary, results in a different Lε in both cases. As it was said before, following Assumption [A15] in Section 3.4.2., we have that T2 incurs in larger εC than T1 ($\varepsilon C_{T2} > \varepsilon C_{T1}$), and T2's more flexible *Framework* allows him to do more changes than T1.

Thus, it is reasonable to expect that T2 would accomplished a larger number of $E\rho_y s$ –and hence, a higher Lε– than T1. Nonetheless, if the εC and the Lε attained were the same for both BSOs, the outcome of the Model would be the same anyway.

3.4.5.3. εPE_{op} for T2

Following (Fn8):

(Df65) $j(y) = 2 \bullet [(pr/n)y^2 + iL - (iL/T\rho)\, y + cie\,] + (pr/r)y^2$

$j(y) = (5/3)y^2 - 20y + 200 + cie$[122]

$j'(y) = (10/3)y - 20,$ and

$j''(y) = (10/3)$

Then:

(Df66) $j'(y) < 0$ for $0 \leq y < 6$ – all y on [a,c),

$j'(y) = 0$ for $y = 6$ – y at [c],

$j'(y) > 0$ for $y > 6$ – y at (c,d], and

$j''(y) > 0.$

Hence,

(Df67) j(y) is a *convex and constant* function in (a,d), with a local minimum at [c], where $y = 6$ and $GTeC = 10$.

Therefore, the $L\varepsilon_{Op}$ is attained when (c) is reached, so T2 produces 6 out of 10 *outputs* efficiently ($E\rho_y s = 6$). Then, rewriting Assumption (S.A.8), the two Lε

[122] The value of *cie* depends on the aggregate level of efficiency attained –i.e.: the outcome–. Thus, when we derivate j(y), the *cie* is zero.

are: Lε(a) where $y = 0$ and no efficiency measures are taken at all (no εC); and, Lε(c) where $y = 6$, so εPE_{op} is achieved by paying $\varepsilon C = 25$.

3.4.5.4. Applying the I-DON'T-CARE RULE to T2

Following definition (D11), we can rewrite the I-DON'T-CARE RULE for T2 as:

> (D22) *The MF will not reduce T2's budget for year t+1 (β_{t+1}) even if he does not care about εPE at all in year t. However, if T2 overspends in t, the MF will finance these additional expenditures and will discount them from T2's β_{t+1}. Thus, all RiL will be pay by the MF, and the resultant RβL will be pay by T2.*

In (D22) we see the *additional assumption for T2* that was elaborated in the previous Section 3.4.5.1. T2 receives his budget for year *t* ($\beta_t = 0{,}5\beta$), but if he overspends –either because he incurred in εC, generated EiL, or both– he will have to pay that *overspending in t* with his β_{t+1}. Hence, T2's β_{t+1} would suffer a β*cut* equal to the sum T2 exceeded his initial β_t.

Here, it can be seen that it does not matter whether this *overspending in t* is caused by εC or by E*i*L. It is a matter of the extent of such *overspending in t*. Then, as it was mentioned before, the more T2 exceeds his initial β_t, the larger the βcu*t* to his β_{t+1} will be.

Further, we saw that if the *cie* were large enough[123], T2 would be better off by paying some εC, even if that implies to incur in *overspending in* t. It follows because the *cie* reduces the E*i*L and hence, the overspending and the βcut. Then, as long as the εC creates a *cie* that reduces *EiL*, T2 should choose YES to comply with the $L\varepsilon_{Op}$ –to reach point (c)– even if that implies to *overspend in t* and to face a βcut in *t+1*.

Moreover, the I-DON'T-CARE RULE-*revisited* states that if T2 incur in *overspending in t*, the MF will finance it during that year. Thus, even though it will discount such sum from T2's β_{t+1}, the MF will suffer a loss in *t* anyway: the RiL.

Therefore, with this version of the I-DON'T-CARE RULE, not all losses are paid by the MF only, as it is the case when the rule is applied to T1. The R*i*L –loss in t– is charged to the MF, and the RβL –loss in t+1– is charged to T2. Finally, each player will pay his own εC, if any.

3.4.5.4.1. Implications

There are a few implications of this new I-DON'T-CARE RULE, for year *t* and *t+1*. All *overspending in t* is a loss for the MF in t –RiL– and a loss for T2 in *t+1* –RβL–. Then, the lower the *overspending in* t is, the better off both players

[123] In this example, *cie* < 0.

are. Further, since *overspending in* t = RiL = RβL = (εC_{T2} + EiL + cie), then it is in both players best interest to increase the *cie*[124] as much as possible, so that will reduce the *overspending in t* and hence, the losses.

On the other hand, we have that T2 will suffer his RβL in year *t+1*. Then if he *overspends in* t, his β_{t+1} will be reduced. Then, T2's β_{t+1} depends on T2's performance in t, with respect to εPE. Thus, unlike the case for T1 with the I-DON'T-CARE RULE, T2 will care about εPE in year t, anyway.

Therefore, T2 should keep in mind that:

(1) His *efficiency-performance in t affects his* β_{t+1}.

(2) The more he overspends in t –i.e.: larger RβL–, the more the βcut in his β_{t+1} will be.

(3) The larger the *cie* he generates in *t*, the better off he will be in *t+1*, since a larger *cie* results in a reduced RβL and hence a lower βcut in *t+1*.

(4) Finally, any RβL is also a loss for the MF, since RβL = RiL.

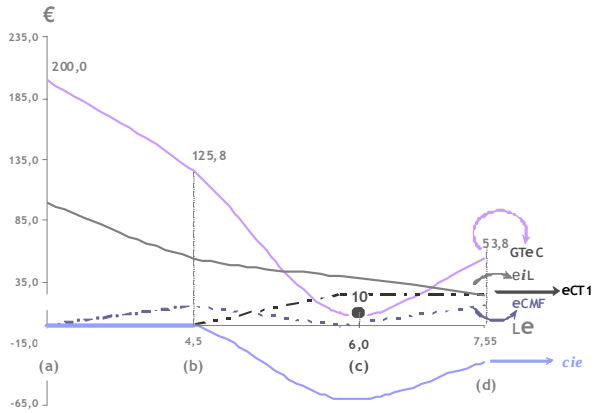
3.4.5.4.2. Strategies for T2 and the MF

Figure 4 and Graph 5 show T2's and the MF's costs matrix and the resultant GTeC, in accordance to Table 5.

FIGURE 4 AND GRAPH 5

FIGURE 4. COSTS MATRIX FOR T2 AND MF IF THE I-DON T CARE RULE APPLIES.

T2 \ MF	NO	YES
NO	100,0 / 100,0	55,0 / 70,8
YES	5,0 / 5,0	19,0 / 34,9



GRAPH 5. GTEC WHEN THE I DON T CARE RULE IS APPLIED TO T2.

The costs matrix shows that T2 have a *dominant strategy*, but the MF does not.

T2's dominant strategy is YES. If he overspends in t, generating RβL, then his β_{t+1} will be reduced –he suffers a βcut– by the same extent of such RβL. Thus, he has an incentive to attain the $L\varepsilon_{Op}$, since that increases the *cie* and reduces the RβL. Hence, he will always choose YES, even in the MF decides to choose NO.

[124] Remember that *cie* < 0.

In this example, when T2 chooses YES and the MF chooses NO, the *cie* is (–60). Then, the RβL decreases by 95. Then T2's β_{t+1} would only be reduced by 10 instead of 200, with a *real gain* of 190. On the other hand, if the MF chooses YES, the *real gain* for T2 if he follows his dominant strategy, is 56,1. It follows because the *cie* is (–30) and the RβL is 19, so the GTeC decreases by 71,9, and the MF pays εC of 15,8, by choosing YES[125].

MF strategy depends on T2's. In accordance to the I-DON'T-CARE RULE, the RβL that T2 faces in year $t+1$ are equal to the RiL that the MF suffers in year t. Then, not only T2 would be interested in keeping such loss as low as possible, but the MF as well. Thus, it could be expected that the MF's strategy would be the same as T2's: a dominant strategy YES. However, that would only be the case if T2 chooses NO. If T2 does so, he will suffer a large loss in $t+1$, but so will do MF in year t. Thus, if T2 does not care about efficiency –despite his loss in $t+1$–; the MF should do it, so its loss would be lower.

In this example, we have that if T2 chooses NO and the MF chooses YES, there is no *cie*. However, the improvement the MF achieves by paying εC of 15,8, generates a reduction on EiL of 45. Then, the RiL is 55 instead of 100, as well as the RβL. Hence, considering the εC the MF pays, there is a gain in GTeC of 74,2.

On the other hand, if T2 chooses YES, then the MF has no reason to spend any sum in εC, by choosing YES too. This follows because the main interest for both players is to minimise the RβL –and so, the RiL– as much as possible, and not the GTeC –i.e.: everyone cares about their own losses and nothing more–. Then, if T2 reduces the RβL as much as possible by paying εC, the MF has no interest in spending any sum in εC. Thus, it would face the lowest possible R*i*L, at no εC[126].

Therefore, the *cie* at outcome (c) –T2 chooses YES and the MF chooses NO– is larger than the *cie* at outcome (d). At (c), the *cie* is (–60), and at (d) is (–30). Thus, even though there are lower E*i*L at (d) that at (c), the GTeC rises if we go from (c) to (d). At (c), GTeC are 10 and at (d) are 53,8, so if the MF would choose YES instead of NO when T2 goes YES, there is a loss in GTeC of 43,8. This loss is due to MF's εC of 15,8, plus the increment of 28 generated in RβL and RiL[127].

Thus, the MF should choose NO if the *cie* is larger at (c) than at (d), even if that would imply to improve efficiency. If the *cie* were larger at a YES – YES

[125] 56,1 = 125,8 - 53,9 - 15,8.

[126] Furthermore, in our example the GTeC are indeed minimised if the MF chooses NO, when T2 chose YES.

[127] GTeC at (d) = 53,8 and GTeC at (c) = 10. Then, the difference is = 43,8. 43,8 = 15,8 + [(24,5-40)) + ((-30,5-(-60)) X 2]. That is, difference = εC_{MF} + [(EiL at (d) — EiL at (c)) + (*cie* at (d) - *cie* at (c))] X 2, since RβL = RiL.

outcome, then the MF would have to decide otherwise. Hence, both players have to choose the outcome with the largest *cie*. Then, the outcome of the *game* when the I-DON'T-CARE RULE applies is the optimum solution, as Graph 4 shows. It is:

(Df68) $y = 6$ and $GTeC = 10$, which corresponds to Lε: (c).

3.4.5.4.3. Outcome of the game regarding (P1) and (P2)

Applying (D*f*6), and (D*f*8) to (D*f*68):

(Df69) $| GTeC_{op} - GTeC_{T2\text{-}BNR\text{—}C} | = | 10 - 10 | = 0$

Hence:

(Df70) $\Delta\varepsilon PE_{T2\text{-}BNR\text{—}C} = 0$

3.4.5.5. Applying the I-DO-CARE RULE to T2

Following definition (D12), we can rewrite the I-DO-CARE RULE for T2 as:

(D23) *All overspending T2 generates in t will be covered by him through his own means. Thus, the MF will not finance any additional costs and then, all losses –RβL and RiL– will be paid by T2.*

3.4.5.5.1. Implications

The I-DO-CARE RULE as it will be seen further, leads to the optimum $L\varepsilon_{Op}$. However, it has implications in year *t* as well as in year *t+1* that should be considered. Firstly, if at the beginning of t T2 expects that he will exceed his β_t, he then has two options: (1) To diminish the number of total *outputs* (Tρ) he has to produce or provide during t, or (2) to borrow the sum he requires to finance his projected *overspending in* t, from somewhere else. If T2 follows option (1), he will fail to comply with his contract with the government, in year *t*. If he follows option (2), he may have to negotiate a credit from a credit institution, with some transaction costs[128].

Both options are *bad* options for T2. Option (1) may be the worst of them. When T2 produces less *outputs* than expected in year *t*, he generates a loss in that year that is equal to the number of *outputs* he failed to produce (RiL in t = Tρ – *produced outputs in* t). Further, if T2 fails to comply with his contract, it implies that the government will fail to produce or provide some goods or services the society demands, which will add numerous costs to the government –*opportunity costs, political costs,* and so forth– besides the RiL. On the other hand, if T2 decides to follow option (2), he incurs in debt (RiL in t = debt).

[128] Remember that by Assumption [A2], transaction costs between T2 and the MF are zero.

However, this debt is not equal to the *overspending in* t, since transaction costs –such as *interests, commissions,* and so on– has to be added.

Secondly, these implications in *t* have consequences in *t+1*. If T2 followed option (1) in *t*, then, in *t+1* he will have to produce more *outputs* than expected, to compensate such costs. Then, his goal for *t+1* would then be to produce Tρ + *not-produced-outputs in* t. There are at least two problems with this approach though. First, T2 might not be able to compensate the losses or costs produced in t; or at least, not by providing those *outputs* in *t+1*. Second, if that would be possible, he will face budgetary restriction in year *t+1* as well, since his β_{t+1} only comprises the sum required to produce the total *outputs* expected for that year.

If he chose option (2), he will face a similar problem: his β_{t+1} will not be enough. Since in *t* he had to get a loan, in *t+1* he will have to pay it. Then, his budget for *t+1* will be reduced by his debt and its interest. Further, if iL arose in *t* and no change was made for *t+1*, it could be expected that T2 would generate further overspending in that year; so, he would then have to add the debt, its interest and a *new overspending in t+1*. Finally, if he were efficient enough in *t+1*, he would only be able to produce at most, the total number of *outputs* he has to provide in *t+1*. Therefore, in the best possible case, the RβL will be the same as the RiL. Nonetheless, it is very likely that such RβL will be higher, and so the GTeC.

Therefore, if the MF applies the I-DO-CARE RULE to T2, the most efficient outcome ($L\varepsilon_{Op}$) might be attained; or at least, that should be the consequence. However, the implications this rule has for T2 are so relevant that its application may end in an outcome far from the optimum.

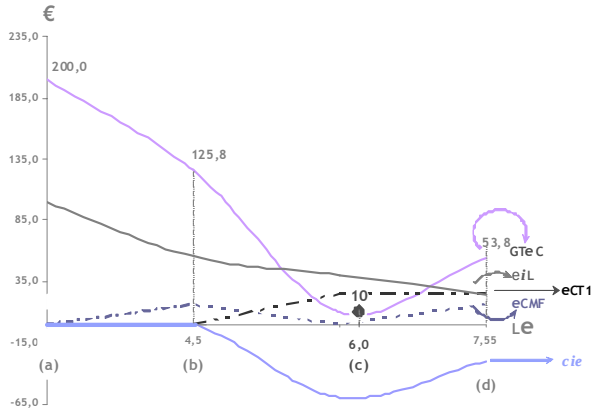
3.4.5.5.2. Strategies for T2 and the MF

Figure 5 and Graph 6 show T2's and the MF's costs matrix and the resultant GTeC, in accordance to Table 5.

FIGURE 5 AND GRAPH 6

FIGURE 5. COSTS MATRIX FOR T2 AND MF IF THE I-DO CARE RULE APPLIES.

T2 \ MF	NO	YES
NO	200,0 / 0,0	110,0 / 15,8
YES	10,0 / 0,0	38,1 / 15,8



GRAPH 6. GTeC WHEN THE I-DO CARE RULE IS APPLIED TO T2.

The costs matrix shows that both, T2 and the MF, have a *dominant strategy*. T2's dominant strategy is YES. T2 is the only player who bears all the losses if the MF applies the I-DO-CARE RULE. Then, it is clear that his main concern is to minimise his RiL –*overspending in t*– as much as possible.

Then, he has to take measures to create the *cie* so that will increase his Lε and will decrease the RiL as well as the RβL. Further, even if the MF does not comply with the $L\varepsilon_{Op}$, it is true that the larger the *cie*, the better that is for T2. Moreover, it is better for T2 that the MF chooses NO, since that outcome produces a larger *cie*, which benefits only to T2, since all losses –RiL and RβL– are charged to his budget.

Then, comparing outcome (a) with (c), when the MF chooses NO, T2 diminishes the R*i*L by 95, if he complies with the $L\varepsilon_{Op}$. That is, when T2 chooses YES instead of NO, he generates a *cie* = –60, by paying εC = 25, and such improvement reduces the EiL by 60. Hence, the GTeC suffer a drop of 190, since the RβL decreases by 95 as well. Thus, by attaining the $L\varepsilon_{Op}$, T2 suffer a total loss of 10 instead of 200. Comparing outcomes (b) and (d), where the MF chooses YES, the losses T2 faces are diminished only by 72, since GTeC drop from 125,8 to 53,8. This follows because, as we said, the *cie* is shorter. In this case, the reduction on R*i*L and RβL are only of 36 each (*cie* = –30,5; εC = 25; and, EiL = –30,5).

Therefore, T2 reduces his losses further by 43,8 –assuming that he will follow his *dominant strategy*– if the MF chooses NO instead of YES.

MF dominant strategy is NO. First, the MF has no incentive to take measures to improve his Lε, since it will not face any losses, no matter what the *i*L are. Then, it has no sense to the MF to pay any εC at all. Besides, if the MF pays εC, which would diminish the *cie*, as we just saw and hence, that would result in higher GTeC.

Then, the outcome of the *game* with the I-DO-CARE RULE is:

(Df71) $y = 6$ and GTeC = 10, which corresponds to Lε: (c).

3.4.5.5.3. Outcome of the game regarding (P1) and (P2)

Applying (Df6), and (Df8) to (Df71):

(Df72) $| GTeC_{op} - GTeC_{T2\text{-}BNR—P+} | = | 10 - 10 | = 0$

Hence:

(Df73) $\Delta\varepsilon PE_{T2\text{-}BNR—P+} = 0$

It may seem that it would be the same to apply the I-DO-CARE RULE than the I-DON'T-CARE RULE to T2, since both outcomes are presumably the same. Nonetheless, as it was argued before, it might not be so. Actually, it could be less desirable to apply the latter, since such rule may produce negative

effects to T2, such as not to achieve his Tρ, to require a loan at a greater cost, if the MF raises his Lε is even worst, and so forth.

Moreover, there is no gain if we shift from the I-DON'T-CARE RULE to the I-DO-CARE RULE. With the first one, T2 achieves the $L\varepsilon_{Op}$ anyway, because it is in his best interest to do so, unlike the case of T1. Therefore, T2 is already *responsible* and *aware* of enhancing the εPE. Therefore, the *spirit* of the I-DO-CARE RULE is already contained in the I-DON'T-CARE RULE, if it is applied to T2. However, as we explained, the lack of the *safety-net* the MF provides to T2 with the latter only increase costs –larger transaction costs, opportunity costs, political costs, and so on–.

3.4.5.6. Applying the I-WILL-DO-MY-BEST RULE to T2

Following definition (D13), we can rewrite the I-WILL-DO-MY-BEST RULE for T2 as:

(D24) *The MF will not cover any RiL caused by T2's overspending in t if he fails to attain $L\varepsilon_{Op}$. If so, T2 would have to cover such overspending in t –RiL and RβL– through his own means. However, if T2 attains the $L\varepsilon_{Op}$, the MF will finance the RiL and T2 will only pay the RβL.*

3.4.5.6.1. Implications

The I-WILL-DO-MY-BEST RULE revisited for T2 allows two possible actions: Either T2 complies with the $L\varepsilon_{Op}$, or not.

If he attains $L\varepsilon_{Op}$, he only faces a RβL in $t+1$. In such case, the RβL would be lower than the εC he has to pay to comply with the $L\varepsilon_{Op}$, since through the *cie* such costs are internalised. Further, if the *cie* were large enough, it would fully cover the εC and a portion of the EiL. Thus, T2 would then face a relatively low RβL. Hence, his β_{t+1} would not suffer a large βcut.

Nonetheless, if he does not attain $L\varepsilon_{Op}$, he faces a RiL in t and a presumably larger RβL in $t+1$. In addition, he would then face the two options the I-DO-CARE RULE presents to him: either fails to comply with his contract by producing fewer *outputs* than demanded, or incurring in larger transaction costs to comply with his output goal, hence increasing his losses. Moreover, since the RβL would be even larger than the RiL, the βcut to T2's β_{t+1} would be to such an extent that it might be impossible to T2 to attain the $L\varepsilon_{Op}$ or to comply with his Tρ goal, in $t+1$.

It is then clear that T2 has to attain the $L\varepsilon_{Op}$, if the I-WILL-DO-MY-BEST RULE is enforced. If so, he will suffer very low losses in $t+1$. If not, losses would then be too high.

Hence, the I-WILL-DO-MY-BEST RULE gives T2 a strong incentive to achieve the $L\varepsilon_{Op}$ set by the MF.

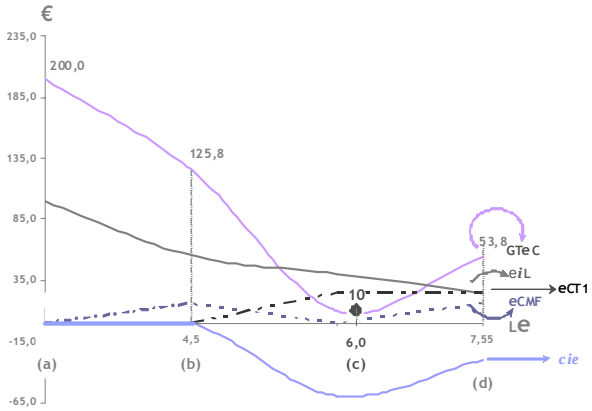
3.4.5.6.2. Strategies for T2 and the MF

Figure 6 and Graph 7 show T2's and the MF's costs matrix and the resultant GTeC, in accordance to TABLE 5.

FIGURE 6 AND GRAPH 7

FIGURE 6. COSTS MATRIX FOR T2 AND MF IF THE I WILL DO MY BEST RULE APPLIES.

T2 \ MF	NO	YES
NO	200,0	0,0	110,0	15,8
YES	5,0	5,0	19,0	34,8



GRAPH 7. GTeC WHEN THE I WILL DO MY-BEST RULE IS APPLIED TO T2.

The costs matrix shows that both, T2 and the MF, have a *dominant strategy*.

T2's dominant strategy is YES. It is obvious. It was just argued that the I-WILL-DO-MY-BEST RULE is a strong incentive to T2 to attain the $L\varepsilon_{Op}$ set by the MF. If he does, his losses will be relatively small. If he does not, the losses would be too high, since he bears all of them –RiL and RβL–. Moreover, if he chooses YES, the RβL that he faces are even lower than the εC he has to pay to attain the $L\varepsilon_{Op}$.

In this example, if T2 chooses YES instead of NO when the MF chose YES as well –outcomes (b) and (d) –, he faces a RβL of 19 instead of 110 (RiL + RβL). Then, the difference of 91 in losses is large enough to cover the εC of 25 that he has to pay to attain $L\varepsilon_{Op}$. Moreover, outcome (d) compared to (b) reduces the GTeC by 72 (RiL = 36 + RβL = 36).

Furthermore, if the MF decides to choose NO and T2 follows his dominant strategy –that is, choosing outcome (c) over (a) –, the benefits for T2 are even larger. He would then face a RβL of 5 instead of 200. Thus, by paying εC of 25, his losses would then be dramatically reduced by 195. And, since the MF does not pay any εC, the GTeC are also reduced by 43,8, if we compare the two outcomes where T2 chooses YES.

MF dominant strategy is NO. It is also clear why the MF will choose not to pay any εC. First, when the MF shares losses with T2 is because he attained the $L\varepsilon_{Op}$. in such case, the R*i*L the MF pays are lower than its εC. Thus, there is no reason to pay larger εC and hence, to raise the GTeC. Moreover, if the MF chooses YES, it would also reduce the *cie*, and that would increase the GTeC. Besides, since the, rule *per se,* provides strong incentives to T2 to comply with

the $L\varepsilon_{Op}$, there is no need for the MF to take any additional measures to enhance the level of efficiency.

In the example, if the MF chooses NO instead of YES when T2 attains the $L\varepsilon_{Op}$ –outcomes (c) and (d) –, there is a gain in GTeC of 43,8. This reduction in costs are due to the εC = 15,8 the MF does not pay, plus a decrease of 14 in RiL and 14 in RβL, because of the *cie*. Then, the outcome with the I-WILL-DO-MY-BEST RULE is:

(Df74) y = 6 and GTeC = 10, which corresponds to Lε: (c).

Therefore, as said, the benefit the I-WILL-DO-MY-BEST RULE has is that it provides T2 with a strong incentive to pay εC and hence, to attain the $L\varepsilon_{Op}$ set by the MF. That leads to the most efficient outcome, since it reduces the GTeC –just as the previous rules do–; but also puts all the burden in T2, unlike the I-DON'T-CARE RULE; and, it assures T2 the *safety-net* he requires to pay his εC without worrying about the overspending in *t* such costs generate, unlike the I-DO-CARE RULE.

3.4.5.6.3. Outcome of the game regarding (P1) and (P2)

Applying (Df6), and (Df8) to (Df74):

(Df75) $| GTeC_{op} - GTeC_{T2\text{-}BNR—Op} | = | 10 - 10 | = 0$

Hence:

(Df76) $\Delta\varepsilon PE_{T2\text{-}BNR—Op} = 0$

4. COMPARING DIFFERENCES BETWEEN T1 AND T2 PERFORMANCE

In Section 3.1., the main objective of this paper was formulates as: *To prove that even if a government applies the same BNR to both, T1 and T2, the former will be less efficient than the latter while executing his budget. Moreover, if that is so, the second aim will be to prove that the BSO who is less efficient –in this case, presumably, T1– will require a different BNR, which will give him stronger incentives to enhance his efficiency level, if his Framework remains the same*.

This objective was translated into Propositions (P1) and (P2). They were formulated in Section 3.3.5. as follows:

(P1) *If the MF applies the I-DON'T-CARE RULE to both BSOs, T1 will be less efficient than T2 due to his weaker Framework.*

(P2) *If (P1) holds, T1 will require a different BNR, which gives him stronger incentives to be as efficient as T2.*

Therefore, in this Section, we will apply the results we obtained in the previous Section 3.4. to prove (P1) and (P2). Further, we will elaborate on some relevant differences between T1 and T2 that we observed, once the game was played.

4.1. Proving (P1) and (P2)

4.1.1. *Proving (P1)*

The condition we require to prove (P1) was formulated as (D*f*10) in Section 3.3.5.1. It is as follows:

(Df10) (P1) is true if $| GTeC_{OP} - GTeC_{T1} | > | GTeC_{OP} - GTeC_{T2} |$

Further, recalling (D*f*6), (D*f*7), and (D*f*50), we have that:

(Df77) $| GTeC_{OP} - GTeC_{T1} | = (\varepsilon PE_{T1} - \varepsilon PE_{T1\text{-}Op}) = \Delta\varepsilon PE_{T1}$

Also, considering (D*f*6), (D*f*8), and (D*f*69):

(Df78) $| GTeC_{OP} - GTeC_{T2} | = (\varepsilon PE_{T2} - \varepsilon PE_{T2\text{-}Op}) = \Delta\varepsilon PE_{T2}$

Thus, following (D*f*4), (D*f*5), (D*f*10), (D*f*77), and (D*f*78):

(Df79) (P1) is true if: $\Delta\varepsilon PE_{T1} > \Delta\varepsilon PE_{T2}$

In accordance with (D*f*51) and (D*f*70), we have that:

(Df80) $(\Delta\varepsilon PE_{T1} = 8{,}5) > (\Delta\varepsilon PE_{T2} = 0)$,so (P1) is true.

4.1.2. *Proving (P2)*

The condition required to prove (P2) is (D*f*14), in Section 3.3.5.2.:

(Df14) (P2) is true if: $| GTeC_{OP} - GTeC_{T1} | > | GTeC_{OP} - GTeC_{T1\text{-}P+} | > | GTeC_{OP} - GTeC_{T1\text{-}OP} | \geq | GTeC_{OP} - GTeC_{T2} |$

Following (D*f*11), (D*f*12), (D*f*13), (D*f*50), (D*f*53), (D*f*56), and (D*f*69), we have that:

(D*f*81) $| GTeC_{OP} - GTeC_{T1} | = (\varepsilon PE_{T1} - \varepsilon PE_{T1\text{-}OP}) = \Delta\varepsilon PE_{T1}$,

$| GTeC_{OP} - GTeC_{T1\text{-}P+} | = (\varepsilon PE_{T1\text{-}P+} - \varepsilon PE_{T1\text{-}OP}) = \Delta\varepsilon PE_{T1\text{-}P+}$,

$| GTeC_{OP} - GTeC_{T1\text{-}OP} | = (\varepsilon PE_{T1\text{-}OP} - \varepsilon PE_{T1\text{-}OP}) = \Delta\varepsilon PE_{T1\text{-}OP}$, and

$| GTeC_{OP} - GTeC_{T2} | = (\varepsilon PE_{T2} - \varepsilon PE_{T2\text{-}OP}) = \Delta\varepsilon PE_{T2}$.

Thus:

(Df82) (P2) is true if: $\Delta\varepsilon PE_{T1} > \Delta\varepsilon PE_{T1\text{-}P+} > \Delta\varepsilon PE_{T1\text{-}OP} \geq \Delta\varepsilon PE_{T2}$

Hence, applying (D*f*51), (D*f*54), (D*f*57) to (D*f*70):

(Df83) $(\Delta\varepsilon PE_{T1} = 8{,}5) > (\Delta\varepsilon PE_{T1\text{-}P+} = 1{,}1) > (\Delta\varepsilon PE_{T1\text{-}OP} = 0) = (\Delta\varepsilon PE_{T2} = 0)$, so (P2) is true.

4.2. (P1) and (P2) if the two additional budget negotiation rules are applied to T2

In Propositions (P1) and (P2), as rephrased in Section 3.3.5., the MF only applies to T2 the I-DON'T-CARE RULE. To T1, however, the MF applies the three rules described. As it was seen in the previous section, when the MF applies the three rules to T1, but only the I-DON'T-CARE RULE to T2, (P1) and (P2) are true. However, the Model was also applied to T2 with the I-DO-CARE RULE and the I-WILL-DO-MY-BEST RULE. Thus, following (D*f*70), (D*f*73), and (D*f*76), the outcome of the game if we apply these two additional rules to T2, would be the same. Then:

(Df84) $\Delta\varepsilon PE_{T2} = \Delta\varepsilon PE_{T2\text{-}P+} = \Delta\varepsilon PE_{T2\text{-}OP} = 0$

Therefore, if either the I-DO-CARE RULE or the I-WILL-DO-MY-BEST RULE were applied to T2, (P1) and (P2) would still be true.

Nonetheless, as it was elaborated in Sections 3.4.5.4., 3.4.5.5., and 3.4.5.6., each rule has different implications that may result in different outcomes, if some conditions are changed. A further comparison of the three rules is elaborated in Section 5.

4.3. Does T2 always lead to lower GTeC?

No. Following Table 2 and Table 5, T2 only leads to lower government's total expected costs when both BSOs choose YES, so they decide to pay εC to apply measures intended to enhance εPE. However, when both BSOs choose NO, the GTeC derived from T2 –*when T2 plays the game*–are higher than T1's. In other words, if outcomes (a) and (b) arise: $GTeC_{T1} < GTeC_{T2}$; and, if outcomes (c) and (d), then: $GTeC_{T1} > GTeC_{T2}$. We elaborate further on this issue next.

4.3.1. *When that is not so, BSOs choose NO, so $GTeC_{T1} < GTeC_{T2}$.*

If both BSOs choose NO, outcomes (a) and (b) arise. Table 6 shows a comparison between T1 and T2, when they chooses NO. As it can be seen, this table combines Table 2 and Table 5. In these outcomes, the MF choose NO –outcome (a) –and YES –outcome (b)–. εC are the same for both BSOs (zero). The MF has the same εC if YES (15,8) and if NO (zero).

Further, Lε at (a) is $x = 0$, and at (b) is $x = 4{,}5$. Both Lε are the same for T1 and T2. The EiL are equal in the two cases: if (a), then EiL = 100, and if (b), then EiL = 55. There is no *cie*.

Table 6

COMPARING GOVERNMENT'S TOTAL EXPECTED COSTS: WHEN T1 AND T2 CHOOSE NO

BSO	Lε		εC		EiL	GTeCi	cie	GTeCii	OPP	GTeCj
	Outcome	BSO	MF	BSO						
T1	a:	NO	0	0	100	100	0	100	0	100
	b:	NO	15,8	0	55	70,8	0	70,8	0	70,8
T2	a:	NO	0	0	100	100	0	100	100	200
	b:	NO	15,8	0	55	70,8	0	70,8	55	125,8

T1 leads to lower *final* GTeC than T2. In outcome (a), T1 generates GTeC*f* = 100, and T2's GTeC*f* = 200. Accordingly, at (b), T1's GTeC*f* = 70,8 and T2's = 125,8. However, as we saw in Section 3.4., T2 is more efficient than T1. Moreover, the latter does not even care about efficiency at all, if the current I-DO-CARE RULE is applied.

Then, why does T2 lead to higher GTeC, when outcomes (a) and (b) arise? Should not be the case that the most efficient BSO *will always* lead to lesser costs? Since that is not so in this case, why does that happen? What factor is creating these larger costs to T2? What is the difference?.

It is an opportunity cost. If we see Table 6, εC for the MF and both BSOs, as well as the EiL, are the same. Therefore, T1 and T2 generate the same *initial* GTeC*i*. In addition, none of the BSOs benefits from the *cie*, since there is none. Hence, *partial* GTeC*ii* does not change either. Only when we sum an *opportunity cost* (OPP) to GTeC*ii*, the difference arises. Then, the variable that increases T2's GTeC with respect to T1's is the OPP.

However, what is such OPP? We consider that this OPP is a cost that T2 suffers for not improving his εPE. In other words, if T2 does not improve his Lε, he will generate inefficiency losses –the EiL–. Such losses may result in lower or none savings –*surplus*–in year *t*, or in overspending –*deficit*– in that year. In any case, T2's budget for year $t+1$ $-\beta_{t+1}-$ would be affected: T2 would then have less money to spend in $t+1$, since his β_{t+1} will be reduced, and hence he may not be able to accomplish his budgetary goals for such year. This reduction would be due to the inefficiency losses in which he incurred in t. OPP can be defined as follows:

(D25) *OPP is the cost T2 pays in year t+1 if he does not improve his Lε in year t. Such costs, then, avoid that T2 could perform further actions in year t+1, since he will have to pay them and hence, his budget will be diminished.*

Then, for T2:

(Df85) $\beta_{t+1} = 0{,}5\beta - OPP$, where OPP = *overspending in* t = RβL = RiL

As it can be seen in Table 6, only T2 faces such opportunity cost. T1 does not. This follows because the OPP is related to the *keep-your-savings possibility* and the *budget-distribution incentive*, which are exclusive of T2's *Framework*. Then, it is both, the *keep-your-savings possibility* and the *budget-distribution incentive* the elements that create the OPP. To see why, we will go through both cases.

4.3.1.1. Why T1 does not face the OPP?

In accordance with Assumption (S.A.1.), Section 3.4.4., T1 is obliged to return any remaining sum of his budget, at the end of the fiscal year. Then, he lacks the *keep-your-savings possibility*. In addition, it is a general rule regarding BSOs type T1, that his budget is integrated into his Line Ministry's budget. Therefore, T1's expenditures are defined in such budget; they are *'tagged'*. In general terms, then, T1 cannot decide at the middle of the fiscal year, to pay some εC that were not considered when the budget was passed[129]. To pay those εC, T1 should have included them in his budget draft, so such costs would have been approved, along with the whole Line Ministry's budget[130].

Then, T1 cannot choose to pay εC in year *t* to raise his Lε, if such costs were not included in his budget, approved in year *t–1*. Moreover, T1 cannot *overspend in* t –just as T2 can– so he can pay those εC, if he did not include them in his budget draft in year *t–1*. As consequence, T1 does not have the *budget-distribution incentive* or the flexibility T2 has, to choose at the middle of a fiscal year, if necessary, to pay εC to raise the Lε and the εPE. Furthermore, if the MF applies the I-DON'T-CARE RULE to T1, he has no incentives anyway to care about raising his Lε.

Thus, it is not only that T1 does not have the chance to pay εC to raise his Lε, neither cares he about it. Thus T1 cannot *keep-his-savings*, nor he can pay εC if these were not included in his budget when approved –no *budget-distribution incentive*–, and he does not care about εPE anyway, since the I-DON'T-CARE RULE is applied.

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[129] Budgeting legislation and practices from many countries allow extraordinary expenditures that were not considered in the budget when it was approved. However, the usual practice is that such expenses are for unforeseen situations. Nonetheless, if this assumption were changed –i.e.: that BSOs could reallocate during the fiscal year a sum to pay efficiency costs that were not budgeted before the fiscal year started–, the argument that follows could change.

[130] That would be the case when T1 goes YES –outcomes (c) and (d)– that will be elaborated in the following Section.

Then, he has no incentives to raise his Lε; because if so, he will not have any gains –*he cannot keep his savings*–, neither he will be able to do it anyway if εC were not included in his budget –*no budget-distribution incentive*–. On the contrary, if he manages to achieve some savings at the end of *t*, he may face the *budget-cut-for-the-next-year-threat*, the *ineffective-manager notion*, or both. Thus, in accordance with the current BNR, T1 will not suffer any losses in year *t+1*, even if he does not care about efficiency at all in year *t*. He would suffer losses in *t+1* if he attains savings in *t* and the MF applies, in consequence, the *budget-cut-for-the-next-year-threat*.

Therefore, T1 does not have a real *opportunity* to improve his Lε by reducing the E*i*L he generates, and so he has no *opportunity costs* if he does not achieve such goal. Further, he has no real interest in doing so, since he is not willing to pay any εC and then to have losses instead of gains, in return. Then, he is better off by not improving his εPE and hence, by not paying εC and not facing the *budget-cut-for-the-next-year-threat* or the *ineffective-manager notion*.

If the two additional BNRs were applied, so T1 would then prefer to pay εC instead of facing larger losses[131], T1 would then choose YES, so outcomes (c) and (d) would arise. We will go through them in the following Section.

However, if one of these two rules is applied and T1 would choose NO anyway[132], he does not face an OPP either. This follows because he would then face real losses –not opportunity costs–, since his budget would then be reduced in the following year, in accordance with the rules.

4.3.1.2. Why T2 does?

In the other hand, T2 faces an opportunity cost when he chooses not to raise his Lε, and so not to improve his performance with respect to εPE.

The opportunity cost, according to definition (D25), affects T2's budget and hence prevents him from performing further actions in year *t+1*. Therefore, this OPP is a real loss for T2, which he provokes in year *t*, due to at least one of the following two costs: the E*i*L he may generate in such year, or the εC he may pay then.

To see that, consider first that the MF applies to T2 the current I-DON'T-CARE RULE. In addition, following the additional assumption elaborated in Section 3.4.5.1., T2's *Framework* allows him to *keep his savings* if he ends year *t* with surplus. Accordingly, he can *overspend in t* if necessary[133], but paying such sum back in year *t+1*, using his *budget-distribution incentive*.

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[131] That is according to Sections 3.4.4.3. and 3.4.4.4.

[132] Such would be the case if one of our initial assumptions failed.

[133] That is, if he has to pay εC, EiL or both, following Assumption [A18].

Then, if T2 chooses NO[134], all his overspending in *t* is caused by the EiL that arise in that year[135]. If so, T2 would require a loan from the MF to pay such E*i*L, as the current BNR states in definition (D22). The MF would collect the loan in year $t+1$, so T2's budget for such year β_{t+1} would be reduced, and $\beta_{t+1} = 0{,}5\beta$ – EiL.

However, unlike T1, T2 has the chance to reduce these E*i*L if he improves his Lε, by paying some εC –*choosing* YES–. He has this chance because he can distribute his β_t in accordance with his needs; so, even if the required εC were not budgeted before year *t* started, he can reallocate a portion of his β_t to pay such costs during t.

Further, if he manages to achieve some savings because the measures he took to improve εPE were successful, he will not face the *budget-cut-for-the-next-year-threat*, nor he will have to return such surplus to the Treasury. Moreover, even if he does not achieve any savings in *t*, he actually would reduce the E*i*L and hence, the βcu*t* –the amount of the loan he has to pay back to the MF– he will suffer in $t+1$[136].

Then, by still choosing NO[137], T2 is declining the chance either to reduce his βcut for β_{t+1}, or to achieve some savings in *t*, which he could use in $t+1$. In other terms, he is neither taking advantage of the *keep-your-savings possibility*, nor of his *budget-distribution incentive*. Thus, by doing so, he is missing the *opportunity* to improve his β_{t+1} and that lack of improvement is the opportunity cost he faces then.

Therefore, this OPP has to be added to the E*i*L he generates at (a) or (b) accordingly.

Furthermore, whether the MF applies either the I-DO-CARE RULE or the I-WILL-DO-MY-BEST RULE to T2 make no significant change on T2's OPP; though it may be even worst for him.

Since we are considering now only the two outcomes when he chooses NO, the EiL are not different; however, further consequences of choosing NO under any of these rules are far more negative to T2 than with the current BNR. Nonetheless, since the losses remain the same, the OPP remains the same as well.

4.3.1.3. Brief summary and further implications

We have then, that if both BSOs choose not to raise their Lε by paying some εC, the obtained GTeC are higher for T2. Hence, when outcomes (a) and (b) result, T1 leads to fewer costs. The difference in costs is due to the opportunity

[134] Outcomes (a) and (b).

[135] Since T2 chooses NO, $\varepsilon C = 0$.

[136] These scenarios are produced if T2 chooses YES. We will analyse them more carefully in a further section.

[137] Outcomes (a) and (b).

cost (OPP) in which T2 incurs, by not taking advantage of his *Framework*, not using the *keep-your-savings possibility* or the *budget-distribution incentive* he has. Then, the OPP is the cost T2 will pay if he does not raise his Lε and improve the εPE.

Improving the εPE, on the other hand, reduces E*i*L, and so the GTeC. When E*i*L are diminished, hence is the *overspending in t* T2 generates, as well as the sum he has to lend from the MF. As expected, if so occurs, the βcu*t* T2 suffers in β_{t+1} decreases too. Thus, it could be said that the OPP is the difference between the βcut T2 suffers in *t+1* if he does not improve his Lε, and a lower βcut he would suffer if he does[138].

T1 does not face the OPP because of two main reasons. First, he lacks the *budget-distribution incentive* so he has no *real chance* to spend any sum in εC in year *t*, unless he has a specific appropriation in his budget for such expenditure[139]. Second, he also lacks the *keep-your-savings possibility*, so he has no incentives to choose YES, since he will gain nothing if savings are achieved and, though, he may be affected by either the *budget-cut-for-the-next-year-threat* or the *ineffective-manager notion*. Thus, it is not only that T1 does not have the *opportunity* to generate such *opportunity cost*, but also neither he cares about raising his Lε since he is better off by not doing so.

Nonetheless, there are some risks on T2's position. The first one is obvious: T2 may generate greater GTeC, if he incurs in the OPP. Then, if he fails to assess such cost and decide not to pay εC to raise his Lε, the government will be worse off than with T1. Therefore, T2 has a greater responsibility than T1 in the resultant GTeC, because he also has a more flexible and autonomous *Framework*. Secondly, if T2 decides not to pay εC to enhance the εPE, the MF might not be aware of that immediately. Thus, at the end, the government may receive unexpected, and not necessarily good, news. We will look into that further in this Section 4.

On the contrary, none of those risks is present with T1. Since he has neither the *opportunity* nor the incentive to improve his Lε, he does not generate any OPP then. Further, he can only choose YES when there is an appropriation in his budget that makes such decision mandatory. Thus, if there is no opportunity and no OPP, the EiL will not increase.

Finally, since the MF does not expect T1 to pay any εC –and actually, he cannot, since he has no appropriation for so–, there will not be a surprise at the end of year *t*.

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[138] This would also be true if instead of losses, there are savings in *t*. In such case, the OPP would then be equal to the difference between the larger surplus T2 would attain at *t* if he improves his Lε *minus* the smaller surplus –if any– he would achieve otherwise.

[139] When that is the case, then T1 ought to choose YES and hence he does not have a real chance to choose either. We will elaborate more on this in the following section.

4.3.2. *When that is so, BSOs Choose yes, so* $GTeC_{T1} > GTeC_{T2}$.

In the previous section, we revised why T1 leads to lower GTeC in comparison with T2, if both BSOs choose not to raise their Lε by paying some εC. Now, we are comparing their results, when they choose to pay those εC and hence, to raise their Lε and improve εPE.

If both BSOs choose YES, outcomes (c) and (d) arise. TABLE 7 shows such comparison between T1 and T2. As we did with TABLE 6, it combines TABLE 2 and Table 5. However, there are a couple of differences. Firstly, in this table, there is a *cost-internalisation effect* (*cie* > 0). Secondly, there is a *final loss* (FLS), instead of the *opportunity cost* (OPP) we had in Table 6. We will elaborate on this concept further.

Table 7

COMPARING GOVERNMENT'S TOTAL EXPECTED COSTS: WHEN T1 AND T2 CHOOSE YES

BSO	Lε		εC		EiL	GTeCi	cie	GTeCii	FLS	GTeCj
	Outcome	BSO	MF	BSO						
T1	c:	YES	0	21,9	41,5	63,4	0	63,4	0	63,4
	d:	YES	15,8	21,9	24,5	62,3	0	62,3	0	62,3
T2	c:	YES	0	25	40	65	-60	5	5	10,0
	d:	NO	15,8	25	24,5	65,3	-30,5	34,9	19	53,9

In our example, T1 leads to higher *final* GTeC.*f* than T2. In outcome (c), T1 generates GTeC.*f* = 63,4 and T2's GTeC.*f* = 10. Accordingly, at (d), T1's GTeC.*f* = 62,3 and T2's GTeC.*f* = 53,9. Thus, in this case, this result in consequent with the conclusion we reached in Section 3.4. that T2 is more efficient –i.e.: he generates lower costs– than T1.

Why does T2 lead to lower GTeC this time? As we did with Table 6, εC for the MF are the same when both BSOs *play the game*. However, as we explained in Assumption [A15]: and in Section 3.4.5.2., when both officers choose YES, their εC and the Lε at (c), differ. Nonetheless, these differences do not explain why the resultant GTeC.*f* caused by T1 are higher than the ones caused by T2, since such differences are not as relevant.

Then, what causes the difference this time? It is the *cie*. If we look at TABLE 7, we can see that T1 and T2 generate quite the same *initial* GTeC*i*.[140] In this case, though, both BSOs choose YES so T2 benefits from the *cie* he generates, as we explained in Section 3.4.5.1.1., but T1 does not.

[140] The slight difference in GTeC.*i* is due to the higher εC T2 pays, and to the higher number of $E\rho_y$s he attains, as we just referred.

Hence, *partial* GTeC*ii* do change because of the *cie*, which is sufficiently large that even if we add on T2's *side* the *final losses* that were mentioned above, he would still lead to lesser GTeC at the end.

Therefore, it is the improvement T2 achieves in his Lε what reduces the GTeC.*f*; and it is accomplished when he internalise some εC in his β_t, even if such goal implies that he has to overspend in year *t*.

As we said, the *cie* is so relevant that it also compensates the *losses* T2 has. These additional *final losses* (FLS) T2 faces, are the costs he pays in year $t+1$ due to the overspending he did in *t*, once the *cie* is taken into account. In other words, as we explained before, when T2 chooses to pay εC to raise his Lε in year *t*, he has to ask for a loan to pay such costs, as well as all additional E*i*L that may arise during that year. If so, he causes the *cie*, which compensates the overspending he does in *t*. Nonetheless, when the *cie* is discounted from such overspending, there still could be some losses. These losses, as we recalled from Section 3.4.5.1., are the sum that T2 will payback in $t+1$ as a βcut in his β_{t+1}. Thus:

(Df86) $\beta_{t+1} = 0{,}5\beta - \text{FLS}$, where FLS = *overspending in t* = RβL = R*i*L after the *cie*.

In addition:

(Df87) If FLS > 0 there will be a βcut, so $\beta_{t+1} = 0{,}5\beta - \text{FLS}$,

If FLS $= 0$ there are *no losses*, so $\beta_{t+1} = 0{,}5\beta$

If FLS < 0 there is a *surplus*, so $\beta_{t+1} = 0{,}5\beta + \text{FLS}$.

So:

(D26) *Final losses (FLS) are losses T2 faces in year $t+1$, once the cie generated in t, compensates the EiL and εC that were paid during such year.*

As it can be seen in Table 7, only T2 benefits from the *cie* and faces the FLS. T1 does not. Besides the arguments that we just formulated here and in Section 3.4.5.1., we will elaborate on this, next.

4.3.2.1. Why T1 does not benefit from the cie?

Definitions (D7) and (D20) in Section 3.4.5.1. states that only T2 benefits from the *cie*, since such effect is due to the *keep-your-savings possibility*, which is only in T2's *Framework*. However, the *cie*, as we have formulated it, measures the positive effect that an improvement in a BSO's Lε, attained in any year *t*, has in the E*i*L that may arise in such year. In other words, the *cie* is the reduction in E*i*L caused by a BSO when he chooses to pay εC rather than not, regardless the MF's decision on the issue.

Then, why is that only T2 benefits from it? Why T1 cannot benefit from the *cie* as well? We have learned that T2 has incentives to induce the *cie*, because he has the *keep-your-savings possibility*. In addition, we learned that the *cie* is a reduction caused in the E*i*L, when a higher Lε is attained. Further, we know T1 does not have such possibility in his *Framework*. Nonetheless, we also know that if the MF applies to T1 the I-DO-CARE RULE or the I-WILL-DO-MY-BEST RULE, he pays εC; hence, he reduces E*i*L as well, and indeed, such reduction could cause some sort of *cie*.

Therefore, why he does not benefit from it? Is it only because of the *keep-your-savings possibility*? No, it is not. Consider the following:

(1) The *cie* only arise if (either) BSO chooses YES.

(2) The *cie* is generated by (either) BSO when εC are internalised in the budget.

(3) That is because such BSO decided to take the risk to spend in εC, a fraction of the budget he requires to produce his Tρ goal. He does so because he expects that such εC will result in lower production costs, due to a higher Lε, so he would still achieve his Tρ goal.

(4) Further, to take such risk is not mandatory for any BSO. Rather, it is a decision some BSOs (T2) can make, but not all (T1), due to their *Framework*.

(5) To pay εC is mandatory to T1, only when there is a specific appropriation in his budget to such end. This appropriation, as expected, follows the same logic than the rest of the BSO's budget.

(6) Then, if T1 receives an appropriation to pay εC in any year *t*, he *has to spend it* in such year, along with the rest of his budget. Otherwise, he will have to return to the Treasury the remaining sum, at the end of *t*. If such situation arises, the MF could then consider either that: (1) T1 does not require a further appropriation for εC, hence his following budget will be reduced; or, (2) he is not capable to execute his entire budget and so, to implement measures to improve efficiency; hence he is an *ineffective manager*.

(7) Consequently, if T1 receives a specific appropriation for εC in his budget for year *t*, as expected, he will spend up to the last cent of such appropriation; he will choose YES. If he does not spend it all, he may suffer a βcut in year $t+1$, or he could be considered an *ineffective manager*. Further, he would cause higher GTeC, since by choosing NO instead of YES, EiL are higher.

(8) Moreover, if T1 executes his εC-appropriation so E*i*L are reduced to such an extent that a sort of *cie* is generated; the remaining sum has to be returned to the MF along with the rest of his remaining budget, if any.

(9) In other words, if T1 pays εC with a specific appropriation he receives rather than by internalising such costs from his budget, and so a *cie* arises; he does not keep the savings generated by the *effect*. Those savings, like any savings T1 may achieve, go to the Treasury anyway.

(10) Therefore, if T1 generates any *cie*, only the MF benefits from it, because: (1) T1 does not *enjoy* the *keep-your-savings possibility*, (2) he does not internalise his εC in his budget, since these are paid with a specific appropriation he received, and (3) hence the εC-appropriation follows the same logic as the rest of T1's budget.

Then, T1 *can* generate similar effects than T2 through the *cie*, *but he does not benefit from those effects*.

Furthermore, T1 will generate a *cie* only when choosing YES is mandatory, because he received an specific appropriation for so and either the I-DO-CARE RULE or the I-WILL-DO-MY-BEST RULE apply. Thus, as it was said, such appropriation is integrated in T1's budget so it follows the same rules than the rest of that budget. Therefore, εC is just another appropriation in T1's budget, that is either fully executed or not.

4.3.2.2. Why T2 does?

Unlike T1, T2 does benefit from the *cie*. He can choose to internalise the εC he requires to raise his Lε and so, to reduce the E*i*L. In addition, if he achieves any savings after the *cie*, he can keep them. In sum, his *Framework* comprises the *keep-your-savings possibility* and the *budget-distribution incentive*, and those advantages allow him to benefit from the *cie*.

4.3.2.3. When T2 does achieves some savings in year *t*?

In our example, even though the *cie* reduces E*i*L generated by T2, there still are some losses T2 faces: the FLS. These losses, as said, are the E*i*L that remains in year *t*, *after the cie*. In other words, the FLS are the R*i*L we enunciate in Definition (D18), Section 3.4.5.1.2. Further, remember from (D*f*61), (D*f*86) and (D*f*87), that R*i*L = FLS; so, if T2 achieves savings at end of year *t* (RiL < 0), he will have an additional sum he will add to his β_{t+1}. However, if (RiL > 0), he generates deficit in *t*, and so the MF will discount it in year $t+1$.

Moreover, one of the reasons T2 may want to pay εC to improve his Lε is to achieve such surplus in *t*, so his β_{t+1} will increase. Indeed, this possibility –hence, the *keep-your-savings possibility*– is one of the most relevant incentives T2's *Framework* provides. Nonetheless, if these FLS still arise, there will not be a surplus, but a deficit. Then, what should T2 do to achieve savings at the end of *t*? Should he increase the Lε up to a level where E*i*L are zero? Should he be perfect and produce all his *outputs* (ρ) efficiently ($E\rho_y s = T\rho$)? Would that be possible? If so, should the MF set the Lε up to a level where $E\rho_y s = T\rho$ so E*i*L = 0 then?

May be not, and it may be not necessary either. Even if the MF would set the Lε at maximum and T2 would manage to reach it, in our example, there would still be FLS. Table 8 shows the resultant GTeC, including FLS, which are attained when the MF sets such maximum Lε, with T2 choosing NO and YES and the MF always choosing YES –i.e.: outcomes (b) and (d) –. We can see that if T2 and the MF pay higher εC –outcome (d) –, they achieved that $E\rho_y s = T\rho$ and so, EiL = 0.

Consequently, the *cie* arises as well and it compensates such εC. However, we also find that there are some losses (FLS = 14,4); so, even with $E\rho_y s = T\rho$, T2 do not achieve savings and hence, a surplus that he can add to his β_{t+1}.

On the contrary, he will still face a RβL in year $t+1$, which is indeed, the resultant FLS that were generated in *t*.

Table 8

GOVERNMENT'S TOTAL EXPECTED COSTS WHEN T2 CHOOSE YES AND ELIMINATES ALL EIL

Level of efficiency			εC	Expected inefficiency loses			cie	FLS	RβL	εC	GTeC
Outcome/Lε=y	T2	MF	T2	y=εpy	δR	Eil	T2	T2	MF	MF	
b: 4,5	NO	YES	0	4,5	55%	55	0	55	55	27,8	137,8
d: 10	YES	YES	69,4	10,0	0%	0,0	-55	14,4	14,4	27,8	56,6

Under the light of these results, we can now enquire: if the MF set the Lε at the maximum level and T2 did accomplish the condition $E\rho_y s = T\rho$, so E*i*L are zero, then, why the FLS still arise? Why T2 did not achieve a surplus instead of such deficit? What is generating these further costs? The answer is simple: a new inefficiency cost. The FLS, then, are not caused by the *i*L that arose during the production process of the *outputs*, since all *outputs* were efficiently produced. These FLS are provoked by an *overspending in εC*, which is generated when T2 spends more in such costs than required. Indeed, when T2 raises his Lε further than the optimum Lε ($L\varepsilon_{T2} > L\varepsilon_{Op}$), this new inefficiency cost arise, and it does because the *cie* is not large enough to cover all the *new* εC, which are too high this time. Therefore, if T2 could ask again, when would the savings will show up?; this time the answer would not be that simple. T2 will end *t* with surplus only if he manages, along with the MF, to reduce their costs further than the *cie*, so GTeC < 0.

4.3.2.4. Brief summary and further implications

We have then that if both BSOs pay their εC and so they raise their Lε, T2 leads to lesser GTeC. This outcome is due to the *cie*. Further, we learned that

even if both BSOs generate a *cie*[141], it only benefits T2. That is so because only T2 can internalise his εC in his budget, so all the effect *–reduction in iL–* is also internalised. In addition, if the *cie* leads to a surplus in year *t*, only T2 can keep it. Nonetheless, T2 may face some FLS after the *cie*, anyway. These FLS are lower than the *initial* E*i*L (FLS < E*i*L), though. In opposition, if T2 and the MF manage to achieve GTeC < 0, then, T2 would enjoy year *t*'s surplus, in *t+1*.

On the other hand, T1 cannot internalise his εC in his budget; either he keeps any savings. On the contrary, if he pays εC is because he has a specific appropriation for such end, which follows the same logic that the rest of his budget. Then, if T1 receives it, he will have to spend it all. If he does not spend it all, he may face a *budget-cut-for-the-next-year-threat* or, he could be considered as an *ineffective manager*. Moreover, if he executes such appropriation entirely and hence he achieves some savings at the end of *t*, that surplus will end in the Treasury.

Finally, even though T2 leads to lesser GTeC if both BSOs choose YES, there is a risk that he may pay εC further than the optimum level and hence, this equivalence may change. We will go through this last implication in the following section.

4.4. Will be T2 more efficient than t1, all the time?

So far, we have learned that if the MF applies the current I-DON'T-CARE RULE to T1 and T2, the latter is more efficient than the former. He is so, because the outcome of his decisions combine with the MF's when such rule is followed, is the same than the optimum outcome. Therefore, T2 achieves the optimum level of efficiency ($L\varepsilon_{Op}$), which minimises the GTeC, when the current BNR is enforced. In addition, he also reaches such most efficient outcome if any of the two additional BNRs are also considered.

On the other hand, T1 does not reach the $L\varepsilon_{Op}$ through the I-DON'T-CARE RULE. On the contrary, his outcome then, is far from such level. However, if the I-DO-CARE RULE is followed, his Lε improves and hence, the εPE level. This improved Lε is not at the optimum point though, because the MF does not raise its Lε.

Nonetheless, when the MF applies the I-WILL-DO-MY-BEST RULE to T1, the optimum outcome of the game is achieved. Both, the MF and T1, increase their Lε, so the E*i*L decrease up to the optimum level, and hence, the GTeC, are minimised.

Furthermore, we compared the resultant GTeC from each BSO and found that T1 only leads to lower costs for the government when neither him, nor T2,

[141] In the case of T1, it would be an effect *similar* to the *cie*, but not the *cie* itself.

pay εC to enhance his Lε. When they both take measures to improve such level and the overall level of εPE, T2 leads to lower GTeC.

Thus, when the game is played with T2, the most preferable outcome is always achieved and, further, such game result in lower costs to the government. On the contrary, when T1 plays it, the optimum solution of the game is only reached when the I-WILL-DO-MY-BEST RULE is applied and, even then, the costs for the government are higher.

Then, it could seem that T2 is more efficient than T1 *all the time*, even when they both reach the most preferable outcome of the game. Moreover, under the light of such conclusion, we could assume that T1 will never be more efficient than T2. Nevertheless, if we are sceptic enough, we could further ask, is that really so? Does such proposition is true, *all the time?*

Of course, our Model does not have the answer for that. As a first approximation on the issue, it simplifies things quite a bit. Thus, many variables are not considered in the Model that could lead to different results. We will not go through them in this paper, though. That could be the aim for further research.

Nonetheless, we will elaborate on a couple of implications of our Model, just as it is, that may give us some light on the matter. We will do so with the intention of just pointing them up, but not analysing them deeply; since for such end, we require a more developed Model.

So, we should enquire again, will be T2 more efficient than T1, all the time? Well, he might not. Some of the following implications for T2 should be considered.

4.4.1. *Accountability*

In general, T2 leads to higher GTeC when any of the BSO chooses NO, as we learned before. That is, when outcomes (a) and (b) result. In such cases, the resultant GTeC when T2 plays the game could be actually, twice as much as with T1.

We concluded in Section 4.3.1. that such difference is due to the *opportunity cost* (OPP) T2 causes if he does not take measures to improve his Lε. He might decide so if he supposes that he will be better off –i.e.: he will have lower costs– if he does not pay such εC and pays the E*i*L that arise, instead. Thus, his decision on whether he pays εC or not, relies on the estimation he makes on the utilities he will accomplish at the end of the year.

Then, if his estimations are not accurate enough, he may choose the wrong choice; and, if such choice is not paying εC when he should do it, thus the game may result in quite an expensive outcome for the government and for T2.

On the other hand, T1 has not that much margin of manoeuvre. As it was explained, he can only pay εC when he has a specific appropriation for such end.

If he does not have it, there is no choice to make. Further, if he has it, he does not have any choice either, since he is obliged to pay them. In any case, he can decide how and when he will execute such appropriation, but even then, he has far more restrictions that T2 for so. Thus, T1's degree of accountability is not quite large on this matter. Moreover, the responsibility on the issue is fragmented among the government's different levels of decision that intervene in this process.

Therefore, the degree of accountability T2 has with respect to T1 is much large, and so it is the possibility he fails. Then, if he chooses the wrong option, T2 could end being far more inefficient than T1, in accordance with our Model. Hence, regarding εPE, accountability and its assessment, are a relevant issue as well[142].

4.4.2. *BSOs' performance and performance indicators*

As it was briefly mentioned in Section 3.4.5., a relevant characteristic of T2's *Framework* is that he works under a fixed contract, which specifies his activities, its length, the budget he will receive, the goals he has to attain, and so forth.

Such contracts supposedly include the means the government will use to evaluate T2's performance, as well. To such end, several types of indicators may have been defined and applied. Thus, if these indicators are not accurate or, if they do not measure T2's performance in a periodical basis, but just at the end of the contract, the government may find a bitter surprise then. Therefore, when T2 plays the game, indicators play a mostly relevant part. They will allow the government to assess T2's performance and, if necessary, to prevent risks or further damages.

In addition, even if the government applies the right indicators periodically, if it finds out that T2's performance is not as good as expected, to call it off may be so costly that it would be preferable to go along with it anyhow.

On the other hand, even though these same issues may arise when T1 plays the game, it is also true that due to his tighter *Framework,* and due to the larger control, the government exerts on him, he is less likely to end the year giving the government such a bitter surprise.

4.4.3. *Transanction costs*

In Section 3.4.5.5.1., we learned that if T2 chooses NO and the MF applies the I-DO-CARE RULE, two quite negative scenarios might arise. These would be caused by the high E*i*L T2 would face, the deny from the MF to finance T2's E*i*L in *t*, and the consequent loss on T2's β_t, which he should use to produce the total *outputs* (Tρ) he agreed with the government in his contract. If so, then:

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[142] See López, A. and Fernández, M. (2004), *supra note 1*, at p. 81.

(1) T2 would have to diminish the number of total *outputs* (Tρ) he has to produce during *t*, so he will fail to comply with his contract; or

(2) T2 would have to borrow the sum he requires to pay those E*i*L from somewhere else, so he may have to negotiate a credit from a credit institution, with high transaction costs[143].

Then, if the MF applies the wrong rule to T2 and further he makes the wrong choice regarding his decision on whether he should pay εC or not, the costs for the government may be too high, at the end. This would not be the case with T1, since he is *in* the government. Thus, in his case, transaction costs are always zero[144].

4.4.4. *How much would an agency cost?*

An additional issue than we have not approached yet, but it is a quite relevant, is the cost of an agency. We did not considered it since we are just assuming in the Model that the only costs we are taking into account are εC and E*i*L, so then we obtain the GTeC. Neither will we introduce such variable in the Model at this stage.

Nevertheless, we should appoint a couple of remarks on the matter. First, agencies may be more expensive than line ministries' offices. Second, to turn a line ministry office into an agency may result in large costs. Thus, such difference in costs may overlap the benefits the government may obtain in efficiency gains, so it would end with an overall non-efficient solution with regard to the economic efficiency criterion[145]. Thus, *the remedy might be more expensive than the illness itself*.

Furthermore, all the clear advantages in T2's *Framework* we have draft –such as the *keep-your-savings possibility,* the *budget-distribution incentive*, and so forth–, might be present, in a lesser degree, in T1's *Framework* as well.

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[143] Remember that by assumption, transaction costs between T2 and the government are zero.

[144] Of course, transaction costs even between the government and T1 are never zero. However, following the assumptions we made in Section 3.4.2., these costs would be zero. Nevertheless, under similar circumstances, it could be reasonable to assume that T1's transaction costs will be lower than T2's, regarding the government.

[145] Therefore, the MF, when making the choice between different BNRs, should consider this criterion also. Economic efficiency, in accordance with the postulates of Chicago Law and Economics, provides the ground for legal decision-making and the evaluation of legal rules. Thus, economic efficiency is a legitimate and important goal for legal-economic policy, as noted by Mercuro, N. and Medema, S. (2006), *supra note 18*, at pp. 105-107. Further, they say that Chicago Law and Economics asserts that *'the purported objectivity of the efficiency criterion makes it the preferred alternative to the ambiguities inherent in using justice or fairness, in the eyes of its opponents'*.

In addition, competition between agencies and line ministries' offices should also be considered. Budgeting forces conflicts among all BSOs, so decisions between competing bureaucracies over the budget are not technical, but political[146]. In consequence, this competition creates costs to the government since once decisions are made winners and losers arise. Moreover, it should also be account that *'politicians may establish an official rhetoric that accords heads of executive agencies with managerial autonomy, but they regularly invade this space, even if surreptitiously'*[147].

4.4.5. *More efficient, but more desirable?*

Despite all the theoretical advantages we found in agencies with regard to εPE, we also have seen that there also a few risks, which they may bring along. Then, in accordance with the analysis we made in this paper, it could not be said that agencies are more desirable than line ministries' offices in any situation, even though they are more efficient.

Thus, additional research on both types of BSOs' *Framework* should be conducted, to reach a conclusion on this matter. What it seems to be clear though, is that line ministries' offices, albeit their tendency to *not care about εPE,* have certain features agencies do not have, that are important for the government[148].

5. COMPARING DIFFERENCES BETWEEN THE BUDGET NEGOTIATION RULES: ADDITIONAL REMARKS

In the previous section, we compare some differences in the performance and results from both types of BSOs, T1 and T2. We learned then, that if the MF and the two BSOs behave as they are suppose to, in broad terms, T2 leads to lower costs and so to a higher level of εPE. However, we also pointed up a few risks, especially in T2's side, that may provoke undesirable results and hence, higher GTeC and a lower level of εPE than expected.

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[146] *See* Peters, B. (1989) *supra note 9*, at p. 222.

On competitive provision of public services, *see for example* Hood, C. (1998), *supra note 53,* at pp. 109-113.

[147] *See* Barzelay, M. and Gallego, R. (2005) 'From "New Institutionalism" to "Institutional Processualism": Advancing Knowledge about Public Management Policy Change', *Governance,* april.

[148] For a further elaboration on line ministries' agencies and their importance within governments, *see for example* Cambell, C. (1979) *The Superbureaucrats,* Toronto: Macmillan of Canada, quoted by Peters, B. (1989) *supra note 9*, at p. 223.

Now, we turn to the BNRs. In this section, the three rules that were used in the Model will be analysed, and so, their main advantages and disadvantages will be gist. We will start with the current BNR, the I-DON'T-CARE RULE; then, the I-DO-CARE RULE; and finally, the I-WILL-DO-MY-BEST RULE.

5.1. Is the-I-DON'T-CARE-RULE a good rule?

From definitions (D10), (D11), (D14), and (D23), we can conclude that the current BNR, the I-DON'T-CARE RULE, imposes all inefficiency burden of any year *t*, in the MF –i.e.: the government–. Then, when this rule is followed, the BSOs have no incentives to raise their Lε, because no matter how large the E*i*L may be, the MF will pay them all. Then, there is no point for them to use a fraction of their budget to pay some εC that will not produce any gain for them anyhow.

Further, the rule as it is, based in an incremental budgeting approach, promotes the inefficient SAP. As said, the BSOs have no incentives to improve their performance on the εPE, but rather they focus on executing their entire budget annually. Then, efficiency is not an issue for BSOs, since it costs. Moreover, to achieve savings due to more efficient performances, may affect them negatively. So, if this rule is followed, they choose not to care about *i*L and neither about εPE. They know that at the end, if they spent all their budgets, these will be marginally incremented in the following year, regardless their previous Lε. Then, all the inefficiency losses such practice generates are *'absorbed'* or internalised by the MF in the national budget.

Despite this clear disadvantage, the I-DON'T-CARE RULE has some positive implications. First, it reduces transaction costs between the MF and the Line Ministries. These costs, for instance, could be caused by the uncertainty that BSOs would have every year if they do not know in advance, what the rules of the game will be. Also, tension and disagreements between the MF and the Line Ministries are avoided; as well as among the Ministries and the offices and public organisms that depend from them. Further, this rule simplifies the budgetary process and reduces discrepancies between the Executive and the Parliament when passing the budget.

In addition, we have learned that the negative effects we considered that the I-DON'T-CARE RULE provokes only arise if such rule is applied to T1. On the contrary, when it is used with T2, the results are quite different.

Indeed, T2's *Framework* comprises some incentives that *do the trick*. In other words, T2 always cares about εPE, regardless the BNR that the MF applies to him, because he will have gains if so, and such gains may even overcome his εC. Further, this current BNR is actually more suitable for T2, than the additional I-DO-CARE RULE that is proposed here.

Therefore, we can say that the current BNR is not a bad rule. Either it is the best one. Then, the point is that it might not be the *right* rule for T1, unlike for T2. Then, it could be this rule, along with T1's *Framework,* what makes it not such a good idea. Thus, the main problem we find on the I-DON'T-CARE RULE is that it does not suit for T1. It does not provide T1 the required incentives he needs to care about εPE, which are neither present in his *Framework*. On the contrary, the incentives it provides are negative. That is, the I-DON'T-CARE RULE gives incentives to T1 to *do not care about efficiency*, since no gains but costs will come from it.

On the other hand, this rule may induce T2 to cause some negative effects on the GTeC as well. As we have pointed up, T2's *Framework* comprise some variables that induce T2 to care about efficiency. They are the *keep-yours-savings possibility*, the *budget-distribution incentive*, and the *budget-length incentive*. These incentives however, may provoke a further cost that is not present when T1 plays the game. Such cost would be the opportunity cost (OPP) T2 may face, if he decides –for whatever reason– not to take advantage of his *Framework* and so, not to improve his Lε.

When this OPP is shorter than the εC T2 may have to pay (OPP < εC), T2 may follow the same *philosophy* T1 applies: I do not care about efficiency, since by doing so, T2 would be paying higher εC than the OPP he prevents. On the contrary, if the OPP is larger than εC (OPP > εC), T2 should pay those εC. However, if T2 fails in this critical assessment, *final* GTeC may be too high, as we learned in the previous Section 4.3.1.

Nevertheless, if T2 correctly assess such risk, the result may be a positive one for the government. Thus, if the MF sets the *required* Lε at the optimum point ($L\varepsilon_{Op}$) and if T2 raise his own Lε up to such $L\varepsilon_{Op}$, the E*i*L will drop because of the *cie* that T2 would then cause. Hence, even though T2's OPP may remain –in this case as final losses (FLS) –, at the end of any year *t*, both parties could end being better off anyway. It would be so if such FLS were lower to the *initial* E*i*L. If so, T2 would then have reduced his OPP by paying εC. Therefore, a question the government should ask, could be, what should be done to generate an OPP to T1, so he would then care about εPE, just as T2 does?

5.2. Is the-I-DO-CARE-RULE a good idea?

It was said in the previous section that if T1 would face an OPP as T2 does, then he would care about εPE as well. Then, the following question is, how would the MF generate such cost? Would it be through the I-DO-CARE RULE? Moreover, would this rule be a good idea? Alternatively, is it only a sort of second-best solution? We will address to such issue in this section.

Following definitions (D12), (D17), and (D24), we have that the I-DO-CARE RULE puts all the *i*L burden on the BSOs and not in the government. It states

that if any *i*L arises in any year *t*, such losses will be discounted from the BSO's budget for the following year that caused them.

Then, the rule generates an OPP for T1, which is similar than the one T2 faces, if the MF applies the I-DON'T-CARE RULE. Indeed, T2's OPP is the sum he overspends in t –EiL, or εC plus FLS–, which he pays in $t+1$. Thus, if the MF considers all iL T1 causes in *t* as a sort of *'overspending in t'*, which such BSO would payback in $t+1$, then it would create some kind of OPP for T1 in *t*, just as it is with T2. If so, T1 would then care about εPE, since by enhancing it, he would reduce the E*i*L he causes and hence, his OPP –the βcut the MF will execute in his β_{t+1}–.

Therefore, this additional BNR gives T1 an incentive –a negative incentive, as some sort of sanction– to raise his Lε, without changing his *Framework*. Then, this rule is a good idea when it is applied to T1.

However, for T2, the I-DO-CARE RULE is not a good idea. T2 already has such OPP internalised in his *Framework*. Then, it does not have further positive effects on his performance regarding εPE. On the contrary, the rule put T2 in a position where he may face the two negative scenarios we explained before.

With regard to the MF, this new rule is a good idea, since it takes all *i*L away from it. Nevertheless, although the rule is good for the MF, it is not for the government. Since it places all *i*L burden in the BSOs, then the MF has no incentives to pay any εC, even if that would result in lower GTeC. In this case then, the MF would assume the same position T1 does with the I-DON'T-CARE RULE: it will not pay any εC.

A further consideration should be made. Who would have the *political will* to enforce this rule? Clearly, transaction costs may arise if the MF applies the I-DO-CARE RULE. First, the government would face *political costs*, since such rule may affect not only the BSO, but some particular interest *–social welfare, lobbies, interest groups, sensible areas, and so forth–* as well. In addition, operative costs should be taken into account, such as the costs to control and evaluate the results; and so on.

However, the MF could intend it by starting with a small T1 type office. Then, letting know the rest of the offices how it went. Further, the MF would build a hard-to-deal-with reputation, so βcut threats would then be credible. Finally, it could perform some sort of preventive sanctions, but not the actual βcuts.

In sum, the I-DO-CARE RULE improves the current I-DON'T-CARE RULE, since it creates an OPP for T1 and so this type of BSO cares about εPE. However, there is a great risk regarding T2, which should be accounted: that this BSO may not comply with his contract or, that he may have to incur in large transaction costs with other institutions. Moreover, this new rule does not provide incentives to the MF to raise its Lε, so the most desirable outcome may not be achieved anyway. Additionally, the costs to apply it, might be quite high.

5.3. Is the-I-WILL-DO-MY-BEST-RULE closer to a shift in framework?

In the two previous sections, the current BNR and the alternative I-DO-CARE RULE have been analysed. We found that the former leads to an outcome where T1 does not care about εPE at all and hence his results are far from the optimum; but also that with this rule, T2 do reach the optimum level of εPE. On the other hand, we learned that the I-DO-CARE RULE provides the incentives T1 requires to raise his Lε and then, εPE is enhanced. Nevertheless, this rule brings along a great risk regarding T2, which may end in high costs for the government. Further, this rule does not incentives the MF to take measures to improve its Lε, so the optimum $L\varepsilon_{Op}$ is not attained either. Finally, this rule might be too costly to be applied.

The third rule introduced in this analysis, the I-WILL-DO-MY-BEST RULE, rather combines the two previous ones. For instance, it puts all *i*L burden in the BSO if he fails to attain the $L\varepsilon_{Op}$ set by the MF, but shifts it to the MF if the BSO succeeds. Then it generates the OPP for T1, as the I-DO-CARE RULE does and it provides a sort of *safety net* for T2 –i.e.: the MF finance him in *t*–, so he can overspend in his first year and hence he can pay εC that will improve his level of εPE. Further, it gives incentives to the MF to raise its Lε as well.

In accordance with definitions (D13), (D18), and (D25), the I-WILL-DO-MY-BEST RULE states that if a BSO achieves the Lε set by the MF, whatever such level it might be, then he will not bear any of the E*i*L. Consequently, if the MF sets such Lε at the optimum $L\varepsilon_{Op}$, that would lead to the most preferable outcome. Thus, if the BSO succeeds, then all *i*L are paid by the MF. However, if the BSO fails, he pays all losses through a βcut in his following budget.

With respect to T1, it improves the current BNR and provides the advantages of the I-DO-CARE RULE. This I-WILL-DO-MY-BEST RULE provides the OPP to T1 that makes him to be aware of efficiency in any year *t*, because if not, he will suffer a βcut in his β_{t+1}.

On the other hand, this latter rule maintains the status-quo that the current BNR sets for T2, which as we have seen, works for him. However, this rule does not bring along the risks that the I-DO-CARE RULE implies to T2, since it provides the *safety net* we have referred before. This means that if T2 ask for a *loan* to the MF to pay εC, he will receive it and then, he would not need to ask for it somewhere else –transaction cost included–, and neither he would have to produce less than expected *outputs*, because of a budget shortage. Moreover, this rule improves a bit the current BNR. It states that the MF would not finance T2´s overspending if he does not attain the Lε set, then T2 has an additional and strong incentive to care about his Lε, which he did not have with the I-DON'T-CARE RULE.

Furthermore, the MF also is incentived by this rule. Since all *i*L would be paid by the government if both BSOs attain the Lε set by the MF, and it would be

likely that both of them would do it, then the MF would be better off by reducing the E*i*L to the optimum level. Then, if for such end it is required that the MF pays εC, it will do so. In such case, the most desirable outcome would be achieved.

In addition, since the rule relies on some sort of *checks and balances* structure; it may have lower transaction costs in comparison with the I-DO-CARE RULE.

Therefore, this I-WILL-DO-MY-BEST RULE may be the most preferable solution of the three rules, since it provides added values, such as the strong incentive it provides to the three players to raise their Lε and hence to enhance efficiency in public expenditure. Thus, it could be considered as a closer shift in T1's *Framework*, which allows at a relatively low cost, to achieve the optimum outcome, where GTeC are minimised, and no institutional reform on T1's *Framework* are required.

6. FINAL REMARKS

In this final section, a brief summary of the objectives of this paper, as well as its results, is formulated. In addition, we revise some basic requirements for further application of this theoretical model, to actual case studies. Consequently, it is elaborated a gist on the players' main characteristics, cases to compare, and possible limitations to obtained empirical evidence. Finally, we address to additional limitations of this analysis, and suggest some lines for further research.

6.1. Objectives, propositions and results: a brief summary

This paper is mainly concern on inefficient practices in public expenditure. In particular, it focus on the one that has been named here as the *spending-all-practice* (SAP). It arises when a BSO spends a large percentage of his budget in the last few weeks of the year, with the sole purpose of executing it entirely, whether a *productive-efficiency* criterion is followed or not. The aim, though, is to leave no remaining sum, which hence would be returned to the Treasury.

A BSO who follows the SAP is not willing to give back to the MF any remaining sum of his budget for year *t*, since such action may affect him in the subsequent year $t+1$. If he does return his budgetary surplus, he may face then a *budget-cut-for-the-next-year-threat* or he could be considered as an *ineffective manager*. Thus, he rather spend all his budget to avoid such situations, even if that implies to incur in inefficiencies whilst executing his budget, during those last few weeks of the year.

Thus, the SAP arises because the BSO does not have the right incentives. As we just mentioned, there are no gains for the BSO if he does achieve a budgetary surplus and hence return it to the Treasury. Moreover, he has to spend a fraction of his budget in εC, in order to attain savings due to an improvement in εPE. On the other hand, if he does not care about εPE, he has neither εC, nor losses. In addition, if the current BNR –the I-DON'T-CARE RULE– is applied, the MF would increase his budget for year $t+1$ marginally, whether he was efficient or not in year t.

Therefore, it could be expected that the BSO would prefer the inefficient SAP and the marginal increment in his budget for year $t+1$, than to pay εC to improve his Lε in year t, if he has no gains but losses.

Nevertheless, we learned that such reasoning does not hold for every type of BSO. It does for T1, but not for T2. The latter has a *Framework*, which provides incentives that prevent such behaviour.

Thus, this research's crucial question is, *if a government wants to enhance efficiency in public expenditure, to which kind of incentives should it focus on? On the incentives generated by the BNR applied to its BSOs when their budget draft is negotiated, or on the incentives generated by the Framework under which these officers work in?*

To respond to that question, we compared both types of BSOs –T1, T2–, and three different BNRs were tested. Thus, we compared the incentives those rules generate and the incentives their *Framework's* provide. We did so using a theoretical model that was formalized for such end. In addition, the results from both BSOs regarding εPE were compared, as well as the main differences on the BNRs. The Model also proved the hypothesis formulated in this paper, which was enunciated in two propositions, (P1) and (P2).

We can conclude, once the analysis was done, that the incentives every BSO's *Framework* provides are sufficiently strong to promote or deter inefficient behaviour on the BSOs, towards εPE. Nevertheless, these *Framework*-related incentives can be changed by additional incentives generated through the BNRs. Then, the government has the possibility to adjust its BSOs' incentives through such rules and hence to enhance εPE without modifying their *Framework*. However, some risks may lead to highly inefficient outcomes and so, to larger losses.

6.2. Case studies and empirical evidence

The results we obtained from our analysis are merely theoretical. It is beyond this paper's aims to obtained empirical evidence to contrast our results, so no actual cases were addressed. Of course, in order to test our hypothesis and to compare our theoretical results, further research should be conducted.

In subsequent works, diverse case studies could be analysed under the approach we had elaborated and then, the main characteristics and results of particular BSOs would have to be studied. Nonetheless, some basic conditions and characteristics those cases should meet, so the Model can be applied, would be:

(1) A BSO type T1, with a budget, programmes, and activities that depend from a Line Ministry. His budget should follow the same budgetary principles than such Ministry's budget.

(2) A BSO type T2, with a multi annual contract, which sets his objectives, budget, term length, goals, and so forth[149].

(3) Both BSOs should be expected to produce similar *outputs*, which can be measured. These *outputs* should also be comparable, at least, between them.

(4) The government's MF should apply the I-DON'T-CARE RULE, as its current BNR.

(5) The government should have a close and cooperative relationship with T2.

Various OECD Member Countries may meet those characteristics. However, some of them are ahead on these issues, so results may vary quite a bit among them[150].

Thus, it could be interesting not only to compare one country's BSOs and incentives, but also to compare two countries' results as well.

Then, two cases could be compared: (1) A country with a more traditional –*weberian*[151]– public administration system and organisation, which would be creating new executive agencies, and (2) a country which had followed a *New Public Management* perspective, so it would have had small and decentralised public agencies for quite some time now.

6.3. Suggestions for further research

Conclusions for future research on this issue are related to the Model's limitations and hence possible manner to complement it. In addition, a study on

[149] *See for example,* Aguilar, L. (2006), *supra note 1,* at pp. 147, 150-152, 164-165, 176.
Xunta de Galicia (2001), *supra note 42,* at pp. 61-62.

[150] *See for example,* Álvarez, S., Pedraja F. and Salinas J. (2004), *supra note 59*, at p. 104.
López, A. and Fernández, M. (2004), *supra note 1*, at p. 80.
Xunta de Galicia (2001), *supra note 42,* at pp. 19-25, 55-77.
Pollit, C. and Bouckaert, G. (2004), *supra note 11*, at pp. 65-102 and Appendix: Country Files, pp. 210-308. They gist an overview on the issue, of Australia, Canada, Finland, France, the Federal Republic of Germany, The Netherlands, New Zealand, Sweden, the United Kingdom, and the United States.

[151] For example, Pollit, C. and Bouckaert, G. (2004), *supra note 11*, at p. 99, formulate a brief comparison of what they call *"weberian elements"* with *"neo-elements"*.

this research results and the Model's implications could be elaborated, so this theoretical analysis would be of some help. Clearly, these two lines for further research complement the necessity of contrasting the results we have learned in this paper, with actual case studies and empirical evidence, as it was mentioned in the previous section.

With regard to the Model's limitations, it should be pointed up first that this paper follows a *budget maximising perspective* from the BSOs side[152]. Thus, by following such approach, it assumes that BSOs' achieve a higher utility function when their budgets are incremented. Moreover, the Model only considers *institutional incentives*[153], which are generated by the BNRs and by the managerial and organisational characteristics that comprise their *Framework*.

Therefore, it does not address to *individual incentives*[154], which focus on the behaviour of every BSO as agents. On the contrary, it analyses the offices as the

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[152] *See* Niskanen, W. (1973), *supra note 93,* at p. 22, where he points up that bureaucrat's utility is assumed to be a direct function of diverse variables, where most of them are *'a positive function of the total budget of the bureau during the bureaucrat's tenure'*. Furthermore, while elaborating on *'why a bureaucrat maximizes his budget'*, he gives three arguments (pp. 22-27): (1) the rationality of the bureaucrat, (2) his will to survive, and (3) the constraint on budget maximisation.

Further, Mercuro, N. and Medema, S. (2006) *supra note 18*, at p. 187, add: *'(…) the* (budget maximising) *model suggest that in masimizing their utility, bureaucrats will make those choices that will maximize their bureaus' budget.'*

See also: Conybeare, J. (1984) 'Bureaucracy, Monopoly, and Competition: A Critical Analysis of the Budget-Maximizing Model of Bureaucracy', *American Journal of Political Science,* 28, 3, august, p. 479.

Niskanen, W. (1968), *supra note 33,* at pp. 293-305.

Niskanen, W. (1971), *supra note 93,* at pp. 5-9.

Niskanen, W. (1975) 'Bureaucrats and Politicians', *Journal of Law and Economics,* 18: 3, december, pp. 618.

[153] *See for example,* Olías, B. (2001b), *supra note 1,* at pp. 10, 11. She names such incentives as *'direct incentives'* (incentivos directos) or *'highly strong incentives'* (incentivos de alta potencia). She asserts that bureaucracy has two characteristics: (1) Public servants do not receive any of the government's utilities (difference between revenues and expenditures), as personal income, and (2) main revenues' source is not the income obtained through the sell of the outputs produced by the BSOs. However, revenues' sources of the government are multiple. Hence, BSOs main objective is, instead, to maximise their incentives source: their budgets.

[154] *See for example* Gibbons, R. (1998), *supra note 45,* at pp. 3-20. The author proposes four (new) strands in agency theory, related to incentives in real organisations. These trends are: (1) objective performance measurement, (2) subjective performance assessment, (3) skill acquisition, and (4) incentive contracts between *versus* within firms. His approach does not focus on public organisaitons, though.

Also, Prior, D. And Surroca, J. (2004), *supra note 77,* at pp. 52, 53. They propose a system of economic incentives, where effort cannot be measured and technology available for the production process is not known. Nonetheless, hey identify a *'reasonable frontier'* for the objectives of the production process and for technical efficiency.

units to study, not the individuals who run them. Neither it explores *'(…) the conditions for which the personal objectives of the bureaucrat are consistent with the efficiency of the bureaucracy'*[155].

In other words, the paper does not focus on the person, but the chair[156].

Further, the Model assumes that all players are rational and have perfect information at all times. In addition, it assumes that transaction costs among them are zero. These critical assumptions may result in quite different conclusions, if changed. Thus, further research should address this limitation and variations on these assumptions might be considered.

In sum, the Model does not consider how would the players behave under a *Principal–Agent* approach[157] and so, it does not address to a possible agency problem between the MF and both BSOs.

On the other hand, researchers should be encouraged by the fact that the simplicity of this analysis may be an advantage if it is considered as a normative proposal.

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[155] *See* Niskanen, W. (1968), *supra note 33,* at p. 293.

[156] As it is noted by Aguilar, L. (2006), *supra note 1,* at p. 213, *'(…) the problem of public administration is not related with the people, but the system they work in'*.

[157] For an elaboration on the *agency problem* and *agency relationships* in the Public Sector, *see for example* Aguilar, L. (2006), *supra note 1,* at pp. 191-192, 231.

In addition, it could be useful to analyse this *agency relationship,* under the scope of what Hood, C. (2000) 'Paradoxes of Public-Sector Managerialism, Old Public Management, and Public Service Bargains', pp. 1-22, *International Public Management Journal,* 3, p. 8, calls the *'public service bargain'*. Barzelay, M. and Gallego, R. (2005), *supra note 147,* quotes the definition for *public service bargain* as follows: *'any implicit or explicit understanding between (senior) public servants and other actors in a political system over their duties and entitlements relating to responsibility, autonomy and political identity, and expressed in convention or formal law or a mixture of both.'* Further, they add that public service bargain *'are configurations of several elements: their dimensions include autonomous space for managerial activity, the political identity of bureaucrats, and the security of tenure of administrative office-holders.'*

For a brief on the classic agency model and incentives, *see* Gibbons, R. (1998), *supra note 45,* at pp. 2-3.

For an elaboration on *agency relationships* and the Data Envelopment Analysis (DEA), *see for example* Prior, D. and Surroca, J. (2004), *supra note 77,* at pp. 51-56, and Pedraja, F. and Salinas, J. (2005), *supra note 59.*

Further, it should be considered that *'(…) moral hazard and adverse selection can be used to explain low powered formal incentives (…)'*, as noted by Tirole, J. (1994), *supra note 47,* at p. 27. For moral hazard and adverse selection issues on public organisations, *see for example* Onrubia, J. (2005b), *supra note 39,* at pp. 152-159. Moreover, efficient arrangements between principals and agents through incentives, which lead to optimum assessment and allocation of risk, could be useful to prevent agency problems. For an analysis on such issue, *see* Shavell, S. (1979) 'Risk Sharing and Incentives in the Principal and Agent Relationship', pp. 55-73, *The Bell Journal of Economics,* 10, 1.

Thus, it could not only be an easy-to-implement proposal; further, it could be developed in many ways. However, several institutional implications and conflicts have to be taken into account for such end. For instance, it is a clear necessity to identify potential obstacles this approach may face, and to explore the possibilities there would be, to implement the Model.

Therefore, further research should be conducted on issues such as the political will required to apply the proposed additional BNRs, on their effects on social welfare, policy programmes, and interest groups, on their normative implications and effects on public administrations on different levels, and so forth.

Moreover, it should be clear that it is a government's aim to increase efficiency of spending programmes. Although it could be expected that society would benefit if εPE is increased and hence it would prefer spending programmes to be more efficient, it might not be the case at all times[158].

In any case, whether this issue is further considered or not, it could not be deny that *efficiency in public expenditure* is, as said at the beginning of this paper, a key issue that is in the core of the current discussion on good budgeting and public expenditure practices. Moreover, it is an increasing demand from societies around the world to their governments.

It seems then that some of the implications of one of Niskanen early works still hold:

'This model of a bureau (…) has important implications for the organization for the production of the large and increasing proportion of our national output now produced by bureaus. What changes could be made to improve the efficiency of the production of these goods and services?'[159].

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[158] Indeed, it could be the case that *'taxpayers might prefer inefficient spending programs because subsidy recipients would exert less political pressure to expand inefficient programs',* as noted by Becker, G. and Mulligan, C. (2003) 'Deadweight Costs and the Size of Government', pp. 293-340, *Journal of Law and Economics,* XLVI, October, p. 310. Furthermore, '(taxpayers) *altruism may weaken, but need not eliminate, taxpayers opposition to efficient spending. Some members of the subsidized group may also oppose proposals to enhance spending efficiency, especially if they relax "barriers to entry" into the subsidized group'* (Ftn 37, p. 310).

[159] *See* Niskanen, W. (1968), *supra note 33,* at p. 304.

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