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On restricted optimizations: The election of the initial conditions.

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In the design or making of a process (e.g. of evaluation), is it common to face say questions of multiple natures. With this objective in mind, purifying or debugging a set of choices until getting to the best one which is therefore unique, represents a critical point.

The present written work introduces the reader to the election of the restriction in the restricted optimizations. To this end, tools of formal character shall be employed, which will therefore allow application to numerous fields such as statistics, physics, chemistry, education, and eventhough not very clearly, to economics. The results of the development in question will allow to answer li what otherwise nothing but hopeless questions, say as the ones devoted to the election of the initial conditions. Ubiquitous though unequal examples are the number of questions in an exam, the amount of water in a well, when there is plenty of slots in a parking load, among others. After each formal element, a creative explanation is provided and indexed with an asterisk asterisk. The third sect. in introduces the state of art of the general problem in question through the literature path The first sect. introduces definitions and obtains implications for formal approaches to the problem in question and The second sect. concludes.

Definition The "impartiality non bounded" rule $\xi_x : \Upsilon \rightarrow 2^\Upsilon$ where $\Omega \in 2^\Upsilon$ and 2^Υ is the set which contains all the subsets of Υ .

*The "impartiality non bounded" rule ξ_x to takes an element of Υ , returns a set $\Omega \subset \Upsilon$.

Definition An impact function $Es : \Omega \rightarrow \mathbb{R}$

*An impact function assigns a real value to each element of Υ .

Definition An element a which satisfies $Es(a) \geq Es(o) \forall o \in \Omega$ is called irreversible.

It is in this way that the optimization problem¹ which takes to the irreversible element a , leaves open and therefore implied the question on the election of the restriction x . This implies that, the central problem of the article is reduced to the next one:

$$\max_{x,I} Es(I)$$

*Find the pair (x, I) which guarantees the best impact $Es(.)$.

It results suitable to prove how the function Es is just a result of the axiomatizations on the space in question² which satisfies independence of the permutability of Υ (this axiom is as well known as anonymity), eventhough this escapes the scope of this article. Symmetrically then the problem is reduced to:

$$\max_x Es(I)$$

defined from the sets resulting from $\xi_x(I)$ totally.

¹In the minimization problem the inequality of the definition is impacted in an evident fashion.

²e.g. Arrow (1950 as cited in Plata, 1999)

Abusing the power which guarantees certain manipulations³, **this is, as a result, with the impossibility of refining the irreversible element a , in comparison, the methodology and unique optimal restrictions.**

I hope the following example to clarify the application of the result in question:

The randomized election of the initial conditions in the Hamiltoniana dynamic optimization.

The problem of the intertemporal election of the restriction k , and control variable c , in such a way to maximize the expression $\int_0^T u[c(t)] e^{-\rho t} dt$ which depends on c in time is the following.

$$\max \int_0^T u[c(t)] e^{-\rho t} dt$$

S. a

$$\dot{k} = f(k) - c$$

$$k(0) = k_0$$

$$\left[k(T) e^{-\int_0^T r(v) dv} \right] = 0$$

Where k_0 is the restriction in time 0, the last condition shows the highly necessary transversality condition, $f(k)$ is the function which represents how the restriction k imposes changes in the future k , and \dot{k} is the change in κ .

After some algebraic manipulation is possible to find that it is enough to maximize the following expression (The Hamiltoniana)

$$J = \frac{c^{1-\theta} - 1}{1-\theta} e^{-\rho t} + \mu [f(k) - c]$$

The first order conditions are:

$$\frac{\partial J}{\partial c} = c^{-\theta} e^{-\rho t} - \mu = 0$$

$$\frac{\partial J}{\partial k} = \mu [f'(k)] = -\dot{\mu}$$

Provided the one to one relationship in the space in question, this taking $u[c(t)] = \frac{c^{1-\theta}-1}{1-\theta}$. By solving the system of equations we get the Euler solution

$$\frac{\dot{c}}{c} = \frac{1}{\theta} [f'(k) - \rho]$$

It is in this way that the in principles well behaved optimization privates of creativity and other solution capacities the problem which therefore is reduced to the election of the initial conditions c_0 and the calibration of k_0 , $u[c(t)]$ and $f(k)$.

Conclusion

³Topological such as for example the Kolmogorov axioms in the case of applications to the design of analytical methodologies in probability and statistics.

Prominently solving we find usual corollaries that particularly make of proving existence and smoothness of the Navier-Stokes equations, of the competency-based, an essential in the general solution of the question on the optimal number of questions in an exam, provided an arbitrary content.

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An application of the Nash theorem (see Nash, 1950) to any n constantly meeting in nothing with smoothness Navier-Stokes equations-players issues a solution existence. It then devotedly remains stability of this result to be shown, which can be achieved through an application of the Emptiness existence theorem (see Rosas-Martinez, 2018) as done in Rosas-Martínez (2021).

This extension is in reverse considered nothing but a smooth solution.