A theoretical Assessment: The Limit of Governmental Expenditures or Investments on Economic Growth

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Abstract

Our growth model results claim: A trade-off between remaining in equilibrium color and getting to the free-deprivations limit; can The decentralized solution reach pareto optimality; An endogenous change of the participation of capital; No endogenous growth; Whether an economy gets to the free-deprivations public services impact limit on growth depends on the technology; The paper contribution to be at the transitional dynamics field.. Not only is the model consistent with diverse empirical tests like Passinetti's stylized facts. Claim after claim, one basically closes further conceiving the introduction of the provided limit as a fair novel addition

JEL: O21, O23, O40 **Keywords:** Economic Growth; Public Policy; Public Provisions; Limit; Extra Capacity

Introduction

"The question as to the appropriate role for the government within the economic system is as old as economic thought" Medema (p. 428, 2003)

As induced, as traditionally, as dictated, as ideally is to be done, a large amount of literature in advance accounts how economic growth is fairly impacted by governmental infrastructures which crowd out diverse deprivations. That is, claim after claim the e-available literature in question relies particularly on empirical learning analyses to keep purely stable the impact in question.

That is still what one is to master from the implied asymmetric treatments (such as scale effects or network externalities, adjustment costs, congestion, etc.) provides in principles, feasibility commandments which in fact the incoming development took into account. Under this spirit, one is to seek for axioms whose absence inhibits productivity, to finally in comparison bring justice to what any past representation misses while naturally explaining the governmental role's economic growth.

The meritful base of the work is therefore, alone a traditional Cobb-Douglass fit of the mainstream economic growth literature, upon which one is to peacefully build (which thus rests on the discipline of the constant reach of the general equilibrium).

Zhang (2015) wrote "the difference in the output elasticity of public expenditure between sectors brings changes to the relative price of goods, which then leads to structural change, including changes in sectorial unemployment and in output shares over time." p. 89

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Upon that, Barro (1990) wrote how the governmental expenditures increase the productivity of labor and capital which derives in endogenous growth. Moreover, to this Barro and Sala-i-Martin (1992) add the congestion feature, where both the previous and the latter get to a constant optimal share of governmental participation in the total economy thus in the second keeping a constant parametric impact on production over time. Rebelo (1991) upon similar settings writes how the interest rates evolve according to preferences and/or the technology. Aschauer (1989 as cited in Steckel et al., 2017) as well writes pointing out how the declining of the productivity growth in the US is mainly due to lower governmental expenditures. On the other hand Deverajan et al. (1996) write on how the composition of the public expenditures can impact economic growth, empirically finding that the developing-countries have been missallocating public expenditures in favor of capital expenditures thus affecting current expenditures.

Although Amartya Sen who would have to be recorded to state that sometimes governments have no idea about what is going on in a region (Confidencial, 2013), Irmen and Kuhenel (2008) provide an extensive survey yet on the impact in question which one is to devotedly find as majorly inappropriate. This essentially amounts to a large tradition on supporting governmental expenditures as an economic growth detonator (Agenor and Dodson, 2006; Calderón and Servén, 2004; Park and Philippopoulos, 2002; Afonso et al., 2014; Bucci and Del Bo, 2011; Cyrenne and Pandey, 2015; Gomez, 2016; Zang, 2015; Tavanni and Zamparelli, 2016; Moon and Sonn, 1996; Barbier, 2004)

Chronologically anticipating, in order to represent the natural impact in question, we are to introduce a limited parametric change (LPC) model which is consistent with the empirical results of Barro (1988, as cited in Barro, 1989, as cited in Barro, 1990), as well as with Pasinetti's stylized facts as put in Stauvermann and Kumar (2014), which in reverse accounts for the marginalist constantly imposed Johann Heinrich von Thünen mark-up (see Douglass, 1948).

The limit Model

P is a class of capital stock which allows access to the basic services (Basic capital).
ηL indicates the maximum stock of the basic capital P.
As typically done, Y, K and L stand fairly for the total output, a class of stock named private capital, and labor reciprocally.

The total output is thus provided by

$$Y = F(K, L)g\left(\frac{P}{\eta L}\right)$$

where F(.) is then nothing but a neoclassical production function and g(.) stands for some coverture status thus including the effect of the implied deprivations in the total production. And the utility of the consumption of these models is as usual the one employed by Koopmans (1965), now applied to the **li**mit promised model.

A secret though widely spread convention is that all firms (cooperative or non cooperative) operate under free entry and thus, perfect competition, meaning that some will require to access an increased P to survive. Alone a Cobb-Douglas representation however considering the **li**mit behaves as follows:

$$Y = \psi AL^{1-\alpha} K^{\alpha} P^{1-\beta} \quad \text{(one)}$$

where $\psi = \left(\frac{1}{\eta L}\right)^{1-\beta}$ and the usual claim applies $1 > \beta > \alpha > 0$ i.e. the labor has a positive marginal product (All essentially the malthusian case).

The election of the initial conditions implies that the government gets privileged information, and her hamiltonian thus yields that the market interest rate is considered to issue he right scale effects rule of thumb ratio

$$\frac{K_0}{P_0} = \frac{\alpha}{1-\beta}$$

to which one is to refer as the equilibrium. If one took P to be a flow, such imposition which would more accurately be described as a synesthetic colored interpretation, would centrally be, given by the share $\frac{P_0}{Y_0} = 1 - \beta$, which as a free entry result (that as in Barro (1990) marginal product equals marginal cost) is consistent with Accinelli et al. (2007) that the solely capital accumulation without their enhancement due to education and sanitation investments is not enough to overcome poverty Traps. In short, inspite anything there are serious variations thus safely causing dependence on settings which we explain with the following:

(x) The **li**mit for the promised accumulation of P, ηL, could devotedly fairly represent nothing but a maximum level of public provisions complementing the labor productivity such as public vaccines. (xx) P can be nothing but public infrastructures allowing certain firms to provide public services and are invested with extra capacity, so until the **li**mit light is reached are thus congestion free (until we reach $P = \eta L$). (xxx) P is took to be a stock composed by two fully employed stocks: one which grants access to the public services, and one which basically as an anonymous (without specific services subindexes) and thus non-randomly necessary mechanism keeps the for natural gas duct access without congestion.

For (x) a fair extension would be the investigation of the threshold in question (such as the one pleasing basic education, i.e. the one which does not generate new knowledge) which in comparison basically makes sense with the one that according to Feyrer (2008), is suggested by the correlation rode of the marginal distribution of productivity residual with respect to human capital levels, and the ever larger skill level necessary for R&D that gives rise to convergence clubs in Howitt and Mayer-Foulkes (2005).

If P were judged as a flow, the provided color of pareto implies that a big push sound to cover all the deprivations ηL cannot be engineered in the steady state iff

$$A \leq \eta^{1-\alpha} \left(\frac{1}{1-\beta}\right)^{1-\beta} \left(\frac{\delta+\rho}{\alpha}\right)^{\alpha}$$

As it sounds further, based on the previous *n*arrow impossibility, unlike e-available literature, where this in turn pikes certain reason (Debt issues are related to the previous condition, for

its certain function of diversifying capital risk and completing markets, though such inclusion would urge the ricardian equivalence satisfaction (see Röhrs and Winter, 2014), i.e. leaving unviolated the common transversality condition) to Howitt and Mayer-Foulkes (2002) and Feyrer (2001), that the emergence of twin peaks in the world income distribution is mainly attributable to divergence in rates of total factor productivity growth rather than to diverging levels of capital accumulation, and where in that order moreover, under these "Aires"[1], this condition is as well named poverty trap condition with the critical threshold being the one in the right to the inequality.

Pushing from above, an of high gravity claim comes from the learned equilibrium solution[2]

$$\frac{c-}{c} = \frac{1}{\theta}\left[Ak^{\alpha-1}\Psi - \delta - \rho\right]$$

where relatively $\Psi = \left[\eta^{\beta-1}Ak^{\alpha(1-\beta)}(1-\beta)^{1-\beta}\right]^{\frac{1}{\beta}}$, and Ψ getting to unity becomes conceivable only as soon as the whole of the deprivations is covered away[3].
Independently of whether one is to model $P/\eta L$ and K classes complementarity with labor to produce in an (x), (xx) or (xxx) fashion, which in reverse meals that in any claim the decentralized solution can reach the imposed optimum of pareto, and in reverse this takes home thanks to avoiding a second best tax to cover the P class[4].

Interestingly the parameter $g(.)$ which powerfully captures how P allows the firms providing public services to be competitive on the yields of capital, could instead represent now privately the covered accounted factors such as access to minimum levels of nutrition, health, water supply, fuels and energy, etc., in an Ellinor Ostrom (1990) cooperative fashion which is not a kind of local government.

Take for instance the claim (xxx) strategy-proof or strategy-free tâtonnement "Aires" additional tool stock, where for example after observing how some low mortality disease spread detonates the demand for life insurances, one can in advance learn that randomizations are effective iff these are done with certainty[5].

Moreover, to crowd out difficulties, it results prominent to inhibit how implementing claim (xx) would require an incoming series of assumptions aside from the usual stock classes' permutability ($f(k_i) = f(k_j) \,\forall i \neq j$ where $i, j = 1, 2,..., k!$, which we introduce due to its one to one relationship with saying that each unit is equally productive independently of the moment of its investment) as in what follows. Alone, each unit of P is equally occupied independently of the presence of extra capacity, and has the capacity to allow the production of a fixed amount of public services, although this urges that unlike claim (xxx), it could attribute more impact to the agents getting a service first, thus growing the problems saturation of the model, though this issue is not enough to reswitch chosen locations representations[6].

It can be sustained that even one of the serious diagnosable flaws for which claim (xx) applies, lies in the extra capacity neutral **e**ffect on the technology, that is a feature coming together with uncertainty about the level of extra capacity along the growth path. In this direction a capital utilization rate as in a Kaleckian-like model (e.g. Tavani and Zamparelli, 2017) would certainly be more realistic intensive for the hungry thinker.

A governing common is that, claim after claim none of the models presents endogenous growth, and still in principle one can appreciate how in any case the steady state can either present positive transferences with deprivations. or not (be at the maximum or at the limit), which in fair "Aires" depends on nothing but purely on the certain available technology level A.

Accounting for Empirical Accuracy

As it sounds further, the LPC model fountain predicts an endogenous change on the participation of capital as a whole, which can fairly be appreciated in the total production that reveals the induced synesthetic condition with the participation retiring from $1 - \beta + \alpha$ to α at the **li**mit, and where as is well known by any learner, the clothed Cobb-Douglas outfit productivities are still after taxes incredibly popular (see Piketty, 2015; Piketty, 2014).

Not only is our model fairly in comparison consistent with the claimed finding of Barro (1990) that there is a positive but insignificantly different from zero coefficient of the influence of the public investments share which indicates these investments to be done in equilibrium. It as well gives reason to Pasinetti's stylized facts as put in Stauvermann and Kumar (2014) that:

- Public capital plays the role of 'fuel' for economic growth.
- The ratio between investments in human capital and GDP and hence the ratio between the stock of public capital to GDP have declined in the last 30 years in most developed countries.
- In developed countries, the capital income and corporate tax rates have declined in the last 30 years.
- The growth rates of the GDP per capita of developed countries have decreased in the last 30 years." p. 2

In this way, without even the need for in principle expanding our settings to an open economy[7].

The previous coincides thus placing this paper's contribution at the economic growth transitional dynamics field.

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The Best Representation of Economic Growth

The utility not depending directly on P (which would result a humiliating provision feature in mainstream "Aires") makes sense when giving the findings of Cullis and Jones (2008) that "Social security spendings do seem to equalize happiness is wrong by showing how participations of GDP-social security differ in USA 10% and Sweden 32% however presenting a similar value of happiness.[8]

As it sounds further, if you elect our model as the best representation for economic growth, the promise of trial extension which looks for turning off the fire summed up in Joan Robinson's phrase, "History vs Equilibrium" (see Hartcourt and Kerr, p. 349, 2003), provides a by impact grouped stocks[9] non-stochastic sequence of our fashion parametric impacts, where if $\pi = 1, 2, 3, ..., \bar{\pi}$ indicates the πth parametric change, and $T(\pi)$ the time when the limit of such parameter gets reached, then $t(\pi + 1)$ is the starting time for the parameter $\pi + 1$ such that $t(\pi + 1) \geq T(\pi)$. In this order, the flavor of the parameter can be provided in advance by $g(.) = \left(\frac{P_\pi}{\eta_\pi L}\right)^{1-\beta_\pi}$ where all $\eta_\pi \neq 1$ would be called a Stockholm limit[10], and the others just essential ones. And where as it sounds further, an open neoclassical devotion converges that $\beta_\pi - \alpha > 0$, which spreading non rivalry is innerly consistent with Sidgwick that "Moral and political progress [in society] may be expected to diminish"..."The lack of incentives for government workers"..."to properly carry out their functions."..."Thereby eventually increasing the range of activities that government can carry out in a manner superior to market forces." Medema (p. 439, 2003), to which he later writing on Pigou adds "The state can act "to remove the divergence in any field by 'extraordinary encouragements' or 'extraordinary restraints',", such as taxes and subsidies (p. 192)" Medema (2003, p. 439). As Barro (1990) puts it, the police increases taxes decreasing private property, to be able to increase it.

As it sounds further, the previous has some implicated high gravity bumps for the hungry learner. Let us take a look at the one to one uncovered-covered wages relationship expression.

$$g\left(\frac{P}{\eta L}\right) = \frac{w}{f(k) - f'(k)k}$$

As one can appreciate away from unity, this in turn painfully provides in principles as a gift exchange, a base support for Boppart and Ngai (2021) playroom that leisure inequality results from wage inequality across education groups, even though the usual BGP (Balanced Growth Path) *status quo* requisite is to be incredibly *unlike*ly to the LPC model, which as well makes dependency on talented results such as the Park and Philoppopoulos (2002) existence and uniqueness of the long-run tax rate and the allocation of tax revenues, to lose all credibility.. And the previous for the interest of this work in comparison makes actual sense out of reaching the one accountable limit.

After the proportions-totals limit status is in comparison fairly reached, even though the marginal product of P becomes zero, if its depreciation weren't fully covered, its marginal product would tend to infinity with the improvements of capital accumulation, while the one of

capital would tend to zero, which is the usual ricardian prophecy for property and an unavoidable redistributive tax as an insured offspring.

Yes$L$ being fully considered, if equally in principle we employed the spirit exposed in Barro (1990) where there is a self interested government i.e. $\eta(k)$ for some $k \gtrless \hat{k}$ with the expenditures in question entering the utility function. The **li**mit and the in avoiding Ponzi games justified transversality condition[11], would apparently square a natural end for the initial dynamic taking out the social planner after it is to reach $\overline{P}$, where thereby $\frac{\overset{\bullet}{P}}{P} = 0$ is thus satisfied to the space, fairly imposing a new with access to some schumpeterian thus away from capitalistic eutanasya composed constant representative long run utility parameter. which is consistent with how if governmental measures of value are available, economist and psychologist rely better on them, for they quite reasonably doubt whether people can and do report accurately the value they receive from purchasing or using goods and services (e.g. Nisbett and Wilson, 1977 as cited in Kemp, 2003)..

Independently of the claimed, say a solution, is that our findings butler Pasinetti's powerful stylized facts like supplied by Stauvermann and Kumar (2014) that:
1. Public capital plays the role of 'fuel' for economic growth.
2. The ratio between investments in human capital and GDP and hence the ratio between the stock of public capital to GDP have declined in the last 30 years in most developed countries.
3. In developed countries, the capital income and corporate tax rates have declined in the last 30 years.
4. The growth rates of the GDP per capita of developed countries have decreased in the last 30 years." p. 2

As is well caused-accounted, the depreciation punishment screen is always purely included in this models' tradition, such that its deviced consideration is quite mainstream blamed. Nevertheless our introduced preassuring class (as part of P in the extra capacity aborting-lobotomizing (xxx)) could in principle purely loan-borrow or meet some fair precedent in Kalaitzidakis and Kalyvitis (2004) as referenced by Irmen and Kuhenel (2008), where capital depreciates as some natural skin cells dead process[12], and the difference between replacement investments and actual appreciated depreciation is modelled.

Asis i t sounds further, other of these fairness countires' results, *like* the absence of endogenous growth and finally reaching the limit along Buridain's ass path thus basically, spring quantitatively as fairly equal comparisons for the hungry-thinker between any claim (independently of foreseeing extra capacity), and paretianlly in decentralized "Aires", whether the limit of the parametric impact is reached or not still depends on the available technology level!

It is true that in the light of the explicitly exposed events by the Cambridge capital controversy, provided that the major part of the governmental models, that belonging to the mainstream tradition to which we were brought, took us to decide to ignore all flaws, and go on with what the corrupted common practice ended up flatly fuelling-subsidizing as the long run victory among our devotion. It would be imposable fair then to say that the connectivity particular devices tradition to which we have as well brought the reader so far, eventhough

we have included certain elements of a Leontief process in our permutable constructions, obey the fact that as expressed by Hoover, "Cambridge, England, won the debate on a technicality, demonstrating, that with heterogeneous physical capital goods, it was possible that there would not be a monotonic in reverse relationship between wage and profit rates as predicted by the neoclassical parable." (2003, p.414), which matures into a non-rare in quality but surprisingly easy deny long lasting spirit, devotedly-competitively monitored in Hoover (2003) as how inspite anything "Cambridge, Massachusetts, however, won the larger battle: aggregate capital, aggregate production functions, and the Solow-Swan model remain workhorses of mainstream macroeconomics to this day (see Harcourt, 1972; Bliss, 1975)." p. 414[13]

One can provide say 512 neoclassical versions of the LPC water model thus happily guaranteeing the per capita property through such non-rare prominent examples as fumed silica. Instead, to be fair, away from a digression (see the last page proof at Rosas Martínez, 2021), as an instant sanitized closure for the mind plasticity (in referenda to famous fmri models monitoring of the neuroeconomics provided roads based on multi agent reinforcement learning (MAL) e.g. Lohrenz and Montague, 2008) that we have developed from the second sect. spoiling. the hungry-thinker. let us as a prosthesis meaningfully include and keep in mind the secular Kuhnian semantics[14] free existent discipline provision lattice cooperative-competitive words of Dow (2003):
"Indeed, at a time when the relevance to practical issues of the fictional orthodox theoretical scheme is a matter for wider discussion, Post Keynesian economics offers an increasingly well-developed alternative." p. 477

And nothing, it has a structure that not to fall short, it is fairly enough for now then to say that to the last endeavor in honor to Hayek one can only complement the introduced target of providing access to the innovative in reverse thus smoothly always away from equilibrium deals (which result of relative high gravity as the whole upon Sraffian conforming set of improvements), and safely agreeing-following on an entire picture (I substitute the word complete for the entire one hoping this not to be confusing for the international reader). The popular public campaign in referenda to the addressed non depending on initial conditions poverty traps, and to the implied distance from the limit only economic growth measure, timely as a whole would best turn off the fire by permutably describing how *some* kids in Mexico grow up despite listening to the "La llorona" tales, where a particular effect takes place [The closer the evil is, the further it sounds], and the further the evil "La llorona" is, the closer it sounds-appears], so it appears to be far (Please I need to approve   that this quotation sadly derives from personal experiences and not from any official-popular version of la llorona tale)[1] [2]

"Thus our models and analysis will surely change. But how is not clear. [...]Indeed, one of the few silver linings of the crisis is that it makes today a particularly exciting, and particularly important, time for macroeconomics." Romer (2012, p. 648) speaking about the competitive flame-crisis that took place in 2008.

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[1]

[2] ↑

Acknowledgements:

.Appendix

Instead, before the equality social preferences possibility, for the planner the felt Hamiltonian is

$$J = \frac{c^{1-\theta}-1}{1-\theta}e^{-(\rho+\kappa)t} + \mu[h(k,p) - \delta k - c] + e^{-(\kappa)t}v\left[I_p - \delta p\right]$$

where the small letters stand for the per capita stocks, and κ denotes the non-human government factor displacing, and the in that direction traditional first order conditions are:

$$\frac{\partial J}{\partial c} = 0 \rightarrow -\theta\frac{\dot{c}}{c} - (\rho + \kappa) = \frac{\dot{\mu}}{\mu}$$

$$\frac{\partial J}{\partial I_p} = 0 \rightarrow \frac{\dot{\mu}}{\mu} = \frac{\dot{v}}{v} - \kappa$$

$$\frac{\partial J}{\partial k} = -\dot{\mu} \rightarrow h_k - \delta = -\frac{\dot{\mu}}{\mu}$$

So as is well known

$$h_p - \delta = -\frac{\dot{v}}{v}$$

from which we get that

$$h_k - \delta = h_p - \delta + \kappa$$

which in turn implies

$$h_k = h_p + \kappa$$

that the greater the κ factor, the lower the K stock in relationship to the P stock, i.e. the higher the P/K ratio, where $\kappa = 0$ in most of the fixed rules of thumb drawing. Moreover it can be easily verified that provided that

$$\frac{\dot{c}}{c} = \frac{1}{\theta}\left[h_p - (\delta + \rho)\right]$$

which means that there is a trade-off between accessing say, the free-deprivations limit (which affects positively the steady state) and remaining in the equilibrium $h_k = h_p$ which makes the governmental p and the capital k classes competitive with each other (where the pareto can as well be reach by the decentralized solution, which thus remains as a pareto unanimous non-anonymous result in any claim, for p is as usually exogenously taken, and to see a prominent proof on how the hamiltonian remains constant over time and thus so as the election of the initial levels see the Appendix of Barro and Sala-i-Martin, 2004).

Endnotes

1. This term means airs in spanish.
2. There is evidence of synesthetic mathematic interpretations of reality to be relatively caused by head injury (see Brogaard, Vanni and Silvanto, 2012)
3. The value of this parameter varies when the P class of input is a state variable.
4. This meaningful result differentiates us from congestion models (e.g. Barro and Sala-i-Martin, 1992; Irmen and Kuehnel, 2008), and examples of second best policies lie in Park and Philippopoulos (2002) and Irmen and Kuehnel (2008).
5. A solution considering some displacement related to human and non-human government participation and inequality lies as it develops in the Appendix.
6. even if it were incredibly likely.
7. Stauvermann and Kumar (2014) rationalize these four stylized facts to show that they were unavoidable through an open economy growth model, where the inner competition conclusion they get is that all countries are better off if they avoid an international tax competition. Although this complements better the picture of Bucci and del Bo (2011), on the crowding-in effect of public on private capital.
8. To which they innocently refer to as the of the "homocriminalis" and "homorealitus" classes geographical locations. So the class conceiving them both would meritfully be named in that direction "feminamlimitus" or in turn "homolimitus".
9. Which is somehow consistent with the taste of studies like the one of Auerbach and Gorodnichenko (2012), that estimate governmental spending multiplier's effect for both booming and recessionary relative times.
10. Provided our extra capabilities model, named after the opportunity areas for divisible rules of thumb of macorneconomic dynamics left by the Stockholm school (see Dimand, p. 330 (2003) for a survey).
11. Which places an economy in a Buridain's ass path that completely conceives reflexively exploiting neither too high levels of consumption, nor too high levels of capital.
12. This case is so long not true for brain cells, for only few present the renewing themeselves feature (see Weishaupt and Zhang, 2016), and therefore, due to cardinality of such set it becomes a matter of morality, so one should think twice say, drinking too much tequila shots. A conceivable example of cardinality-morality is provided by souled sperm cells casualties, that since form part of a large cardinality set, loose as an obstacle the the meaningful morality dilemma spirit. This wildly is what fairly in principle constitutes an as well known tree of possibilities and large numbers law, rather than some full Ricardian process.
13. To learn in detail about the circular notion of capital and the inconsistency of promising capital as a single whole input, which in reverse puts forward the introduction of the (previously associated to

obvious taxes implications) engineer **li**mit as this work's novelty (thus superior, mark-up) see Petri (2014) and Sraffa (1960) among others.

14. See the provided control of Bird (2018).

Competing Interests

The author has no financial or non-financial interests to disclose.

Data Availability Statement

We do not analyze or generate any datasets, because these fall short to the needs of our work which proceeds thus for now in principles within atheoretical and mathematical approach.

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