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A Close up to Social and Governmental Factors: The introduction of the Limit to Economic Growth and Development

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DEDICATION

A mis papás, cuyo ejemplo de visión y arduo trabajo sigue dándome la fuerza para continuar en el alcance de mis objetivos, y a mi profesor Elvio Accinelli Gamba cuya disciplina y determinación admirables en el alcance de una visión fantástica, han y siguen contagiando, inspirando, y formando enteramente a tantos dentro de la obscuridad (el mál en cuestión). Gracias por alumbrar los saltos entre los techos en este escape.

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VITA

Born in Celaya, Guanajuato, Mexico on April 18th of 1988. Son of José Romaldo Rosas Vázquez and Gloria María Martínez González, and stepson of Roberto Javier Pérez Cárdenas and Emelia Flores. Brother of María de J. Rosas Martínez, Julio Cesar Rosas Martínez and Marco Antonio Rosas Martínez and stepbrother of David Armando Moreno Flores, Salvador Moreno Flores and Carlos Manuel Moreno Flores.

The Universidad Autónoma de San Luis Potosí awarded Víctor with an academic excellence medal (2008-2009), and selected him to attend academic exchange programs at Mahidol University International College (Thailand, 2010) [where I learned basic communication in thai (bargaining skills](The square brackets were added by me.)], and at Centro de Investigación y Docencia Económicas (Mexico, 2011).

I first met Víc tor Hugo Rosas Martínez when he was a student at Universidad Autónoma de San Luis Potosí (Mexico) in 2012, to whom I supervised in the realization of his bachelor thesis. The work which was developed back then, dealt with a decomposition of the Atkinson income inequality index, through a central concept of the cooperative game theory named Shapley value. This focus allowed the certain identification of the opportunity inequality participation in the total income inequality, and from this development the article Sánchez-Pérez and Rosas-Martínez (2012) got published. In the same year he would obtain his Bachelor's Degree in Economics from the Universidad Autónoma de San Luis Potosí (Mexico) with honors.

Currently he affirms that his bachelor's thesis contributed importantly to his thought, interesting him on the implications in terms of the life style of a population that hide behind the design of economic policy.

In 2012 Víctor attended (informally) my lectures in the master of mathematical economics of the Universidad Autónoma de San Luis Potosí, where he showed interest for the axiomatic approach of the cooperative game theory. At the end of the same year he got in the Ph.D. of the Universities of the Tuscany Region.

He has attended research visiting programs at Universidad Autónoma de San Luis Potosí (Mexico, 2014), and at Universidad de Vigo (Spain, 2014 and 2015).

I was very lucky to have Víctor as a student and I have greatly enjoyed collaborating with him.

Joss Sánchez-Pérez

CONTENTS

0.1 Preface

We live in a world that rewards highly the unfair; still all hopes disapointingly take refugee on uncertainty. An evident destination to a reproducing society that yet devotedly dares to call this growth, where one is to see this status quo as natural, individually of how many crises it hits.

Orientation is required for those that such as my early self, attempt to enter into the study of the field of the Economic Praxis. A relationship that gets easily lost in the daily rule of the appreciable world, is that *o*ne can usually do more than what *o*ne thinks *o*ne can do.

When it comes to taxes, the problem that I first found about becoming an economist and talking to a politician, is that basically, one can never stop looking at where taxes come from, while theycan never stop looking at where to put them, therefore independently of the proper economic thought frameworks in question. That is, in principles inspite the many existentstudies on the GDP impact of this topic (e.g. Barro, 1990; Rebelo, 1991; Barro and Sala-i-Martin, 1992; Devarajan et al., 1996; Esfahani and Ramírez, 2003; Auerbach and Gorodnichenko, 2012), the discussion that takes place in order to purely set one fiscal configuration shall always obey the evident rule of thumb that we were all brought to; the representative agent.

This sort of issues arise the implicit importance of practice in managing resources to fully occupy certain positions in the structures that establish the GDP of a region, due to being familiar with, the reigning institutions in question and thus, its functioning according to escape from a briber concept of endogenous optimal tendency. In this respect, the social patterns such as the definition and thus respect of the human rights

charge relevance and interrelation when determining the welfare of but putting it nicely, regions claimed as single ones.

This to say for everyone obvious points remark the study and addressing of questions that involve the covering of basic and non-basic needs (and thus, the causes of deprivations), the role of governmental expenditures and social patterns (such as the ones to set profiles to occupy positions in the productive structure), away from elected innocent theories, to perform a close up over its impact on economic growth, which is fairly attempted in the present work, that in turn is to reveal a limit of the implied parametric changes, thus yielding insights on true growth transition dynamics.

Provided that the so called apt individuals shall therefore be more *like*ly to gain the experience respect to the ergodic space in question, and that I have spent most of my labeled as productive time performing research on these *waiting economy* issues, in order to look for capturing an always greater picture, this work took research and generalized life experiences with projections that some may find conveniently delusional, for to form the final objective that is therefore a better theory and thus quite an uneventful society.

Whereas a random walk results the typical setting for plenty of mind experiments, a random run would instead translate into an *incredibly* dangerouse implications.

In principles, it results fully coercive to conceive modelling away from certain fashion to which we are all brought. Plenty of great roads of heterodox thinking will never see the light which basically is thanks to mainstream economists. The usual economics student such as myself is to after the second chapter, discover even an away from mainstream development, that by reversing to the true concern of economic theory namely rent distribution, fairly interlocks overcoming accounting growth problems among other

endemic to the economic growth frame common claims, such as considering the (as implied by the Cambridge capital controversy) well known human capital paradox. We find that undoing completly the wealthy influential groups such as elites in turn takes to the limit of economic growth.

Issues and procedures in the neighborhood of this Ph.D thesis (such as vision occluding game theoretic, mechanisms design, institutional, and even behavioral approaches) result as just nothing but superimposed routes, unless someone in the large waters of available research had spoken in similar sound, in which case, just confronting such homonym ideas should in parallel imply so long, a to include ally, where bringing a previous essential spirit forward in renewed "Aires" (this word means airs in spanish), if any, is as well nothing but a bred contribution, which fairly makes us a unique body of novel additions to the spirit of economic growth and development, concerning deprivations, policy design and social patterns, where although constantly moving away from what would be established by the spirit of the receiving the novel prize lecture of Akerlof (see Akerlof, 2001), what in here developed is to form part of the Behavioral Macroeconomics frame.

Among our important results we find that accessing the growth limit (the global normative point) implies staying away from the equilibrium.

On the propper frictionless way to read this fairly specific and refined work where we attempt to provide a common place for mathematicians and social scientists I can just say that regardless the fact that many times *messages* happen to be limited or divided by each hyphenationto fit distinct pages fashions each statement results purely equally productive independently of the moment of its investment on a chapters and

conclusions spirit. .

At the time I am to finishing writing this Ph.D. dissertation (June-August, 2020), 3 Major issues outstand in the current world: The spread of COVID-19 over the world, Incredible protests due to the kill of an unarmed afroamerican man (George Floyd) by the hand of the police (state of Minesota, USA), and a serious series of civilians killing for extort profits (as well as massive armed car stealings and femicides) at my hometown, where according to certain possibilities I currently reside (Celaya and the surroundings under the Guanajuato state, México). So I in advance apologize if in the hurry of fairly looking for finishing this thesis, some implied topics result as treated with too little deepness in comparison to what they in turn deserve, and for all the innocent mistakes that in such hurry took place. The fair global contribution we have chosen to reward of my presence thesis is the in thought formal wholeheartedly introduction of the limit to economic Growth though.

0.2 Introduction

0.2.1 Mathematics Applied to the Social Sciences

I would *like* to start providing a short justification about the application of mathematics to the social sciences, given that this thesis will employ such kind of univers Leanguage.

In order to analyse the effect that the certain axioms capturing true aspects who are part of a social phenomenon , the mathematics can allow the preservation and posterior consideration of possibly hidden implications, that up to certain scale could get more easily lost during a purely verbal description. Moreover, formal analyses can become more easy to remember due to the possible multiple deductions of *the* implications in question that lie on the equations. *Finite or infinite* domain and range can thus be employed, and found present |n correlations making to show robustity (universality), beyond otherwise hardly depreciated knowledge.

Invite social scientists to learn the flow of mathematics and mathematicians to address the liquid social sciences, and the successful cases might basically be able to organize their arguments in a hard clear way, which could derive in a comprehensible theory with great benefits for the human living and understanding. Some of these em*path*ic intersections form part of, what is popularly known, as basically capital of the economic theory *tangent*.

0.2.2 Economic Growth, Policy and Development

> "The number of sets is infinite, and in any particular case the selection of cne of them must be determined by its compatibility with the values prevailing in the community the welfare of which is being studied. For only if the welfare principles are based upon prevailing values, can they be relevant to the activity of the community in question." Bergson (p. 323, 1938)

When Wicksell writes: "The unlearned multitude may fail to comprehend, and many educated people may be *un-willing* to comprehend. But the economist should shun the popular prejudice, and should attempt to fight it with all the power at his command. For by the nature of his studies he can view these matters in a better light, and he, more than anybody else, is under an obligation to proclaim the truth concerning them.", It is clear that how independently of how confusing it mightresult his contribution away from a quantitative theory of money, a natural dependence on a powerful club is say established-recognized. It is precisely that confusion on which we very much desire to contribute, i.e. what one should identify as the direction of some natural rate.

Surprisingly natural and cloudless it results for me to bring anyone to the following growing introduction when it comes to addressing some genuine question about the economic evolution which seems to suggest social entropy as the ricardian regime demands.

economic Growth is an important population life style certain indicator. This is, for who enjoys a fixed rate of growth, the real *per capita* income increases exponentially

with time, and thereafter, small differences between the growth rates of two regions can result as high differences! after a certain period of time. We can for example adapt a consideration that in the 1950 Mexico had a real *per capita* Gross Domestic Product (GDP) of 2,252.63 (USD, 2007), while Brazil had lived one of 2,067.64 (USD, 2007), and how the long run annual growth rate of Brazil was higher for only 0.65 %, causing the real *per capita* GDP of Brazil to be also greater for 298.68 (USD, 2007) in the year of 1973, which is almost the 15% of this Brazil's initial condition[1]

Eventhough this time amazing for anyone indicator does not give anyinformation about the rent distribution within a common region, other indicators such as the population living under the poverty line, or an inequality index can be poor but fully useful to get an idea about it[2]

The economic growth of a region is studied instead of the individuals' consumption of specific goods, because the composition of the total output depends on the populations' taste which is then different for distinct countries cardinalized as developed and developing, in what, contained we can find services that are used to cover daily basic needs, and are *commonly* ordered by agents in most of the regions when they are affordable . A less extreme analysis is provided by moving away from either looking at for many defined as basic services or poverty environments, *like* a jet owning deprivation or food deprivation. Considering this, it will be of our concern how a minimum decent indicator of a life style of a population is provided by, the access of the individuals to specific basic services. Furthermore, we shall take into account how these services are

[1] The illustrative data was taken from Maddison (1989), and deflated through Webster (2020) .

[2] Pritchett (1997) calculates a lower bound for *per capita* GDP that is inconsistent with plausible levels of nutritional intake. Moreover, Sen (1973), Atkinson (1970) and Gini (1936), among others, have proposed income inequality indexes that measure, and Kuznets (1955), but more recently Ros (2000) and Ostry et al. (2014), among many others, explain mechanisms behind the unambiguous correlation between this so great concept states, and economic growth.

related to the survival of modern economic growth, where fairly the government plays a key role in allowing its access.

Dependently, the role of the government is important in standard economic growth , and representing some other specific ways in which it impacts the total production will allow us to point out some of its attributions and limitations, concerning the one life style of the population. We will also fairly consider how social patterns*like* the propensity of the respect of human rights within a region, are to be considered when it is desired to analyze the life style of a population.

The previously mentioned introductory aspects among others have been highlighted by the United Nations (UN), forming part of its concerns in its 2030 agenda for sustainable development. In order to go further in the understanding of the relevance of the mentioned points for the human welfare, the present thesis looks for providing theoretical explanations about certain parametric changes on the total production, which just result from the technological changes that are related to the standard access to basic services, specific governments, and social patterns.

From our revolutionary analysis we shall fairly obtain nothing but a theoretical intuition that allows us to get a fair understanding of implications on the welfare policy design, where the common feature of the analyzed economic growth factors is given by its impacts' limit.

The work is divided by three standard parts that cause chapters according to *shared properties.*

The first chapter focuses so long how the access to certain basic utilities [3] is important for a population's life style, considering how its access improves the productivityof

[3] Water, electricity, natural gas and drainage system .

the firms. This chapter draws public policy implications about how looking for targeting a normative point without deprivations of these services, is chiefly related to reaching the optimal of Pareto[4], while addressing why poor learner countries do not overcome such situation, provided that the access in question has a positive impact on the total production[5].

This provision is as well as right as is that *o*ne of public services such as roads, courts of law, publicly provided vaccines, etc., that do participate in the total production of a region, and representing this, will be our principal essential concern in the second chapter, where we present mathematical models which complement aspects that are contemplated by previous mainstream duties[6], only obtaining differential results. Moreover, this thesis fairly builds up on how while some public services add productivity in specific regions, it cannot be the case for others[7], and to capture the full impact of the public services which are productive, the employed particularpublic expenditures' climate we took as provided.

The first two chapters, contained in the *o*ne part, bring the reader to follow the fair mainstream framework of economic growth, to by first sharing common settings for modelling that will fully be in brief, provided in the growing previous to the chapters introductory subsection, after introducing applications of the limit parametric change model, grasp important results such as an autonomous Big Push to erase derprivations impossibility.

Naturally after that, aside from previous chapters' claims, and eventhough part of

[4] The optimal of Pareto can be achieved by a social planner with dictatorial attributions which internalizes the externalities of the investments, (e.g. Barro and Sala-i-Martin, 2004)

[5] Aschauer (1989, as cited in Steckel et al. 2017) point at the lack of public infrastructure like roads, piped water etc. as one of the main reasons for declining productivity growth in the US.

[6] e.g. Barro (1990), Barro and Sala-i-Martin (1992), Devarajan et al. (1996).

[7] This is because the need for some provisions could not be present in some countries, due to substitutability.

the Behavioral Macroeconomics that were proposed as an ideal development by George Akerlof, moving away from certain of its settings, thus it is left for the part two and third chapter the deal with a representation, about how social patterns *like*, a generalized discrimination of individuals presenting specific aspects[8], the influence of groups such as elites fully affect the election among job candidates[9] rather providing some pattern that thus commonly results as all but some remote promoted fitted possibility of success, which even lets down to an effect in the one long lasting spirit of the total production of an economy. This chapter also issues fair representations and justifications to establish an intuition about how the social patterns impinge the productivity in others way, and uprises requisites on the respective social patterns' changes of time by introducing the concept of "mécaniques", that as well by reversing to the true concern of economic theory namely rent distribution, fairly interlocks overcoming accounting growth problems among other endemic to the economic growth frame common claims, such as implicitly addressing the (as implied by the Cambridge capital controversy) well known human capital paradox. To always find a fixed point i.e. a kind of technological change.

Under that spirit, The third part subtracts the conclusions drawn from each of these content gravity layers (chapters), and so as the general ones, that are to be all contained in the fourth chapter, where since a part from certain implications for economic policy design relativity, the representations *will* in fact get relations between income inequality an economic growth aswell, we addd a fast comment about this findings in the general spirit conclusions.

[8] Such as, say a religion, a race, sex, etc.
[9] An thus affect the entrepreneurial opportunities of the agents.

The mainstream economics framework has proved success due to popularity and is therefore, the language which in principle is elected to develop this travel.

0.3 General settings for Part

The models in this part of the work bring the reader to following the mainstream framework of economic growth[10], and in the following some common general settings are provided.

The representations of reality will have the same structure of the Edgeworth equilibrium and supply will always be equal to demand! As is acceptable to assume, there will always be two sectors, the private and the governmental, as for independently of their end, there will be firms which can be private profit rates maximizers or public firms maximizing welfare. Moreover, all the firms in the economy are guaranteed to be producing at perfect competition, which means the public firms shall thereby produce at perfect competition prices .

We promise you that markets will prevail, for wisdom mandates that for welfare to find its way among the people, the government firms shall exchange in freedom with the households that shall thereby keep their life and the two sectors one. We will allow for the usual precept that all the firms must have access to the same technology[11] to be respected. Provided the input of well behavied scarcity of final product Y, we are to take its price the numeraire, i.e. the stable social point unit.

In comparison, the possibly heterogeneous relative prices will be charitably given by the composition of the final output. As it sounds accurate in principle, we accept that the firms will rent property K and labor L from the households to produce the tonal product Y. Moreover, we denote well *per capita* product and *per capita* `capit`al referencing small letters such as y and k respect.ively[12].

[10] e.g. Solow (1956), Cass (1965), Koopmans (1965), Barro and Sala-i-Martin (2004).

[11] In practice there are firms that might need to access extra factors in order to access the common technology, and we get back to this, later for each particular model.

[12] Guided by simplicity and by certain tradition on growth dynamics we are to even omit the time

In the next sections we will represent the parametric impacts on the total production, that fairly result from our provided factors, and in order to focus in such effect considering the otherwise stagnation possibility , we for the sake of say as well accuracy are to soundly accept a constant technological level a. Moreover, among our fair construction properties we will ensure the population to be equal to the total labor $L > 0$, and for simplicity, we assumed it to be constant, and thus, there need not be holes filling and digging in terms of day-insomnia-night dependency over time fair questioning[13].

As is usual we will accept to have a safely closed economy, therefore each unit of capital could be permuted to be equally productive , and this necessary stock will only get δ depreciated at a rate .as

Beforehand, provided that each household is to maximize his total utility over time (in some perfect foresight fashion),

$$U = \int_0^\infty u\left[c(t)\right] e^{-\rho t} dt$$

for the agents care about their future consumption and have utility of inheriting to their descendants. The temporal utility shall get discounted at the temporal preference rate ρ which is to satisfy $\rho > 0$, for we must represent the certain selfishness of the individuals intertemporally.

Picturing this, the corresponding measure is necessary that the consumption and savings of the representative agent, will be equivalent therefore to the ones of the average agent of the economy which is composed thanks to many all visible to us families[14].

sub indexes of the variables.

[13] Only the first section of the second chapter will afford to consider an safe exogenous growth of the citizens, for such relatedness to its respective purpose is to result evident.

[14] e.g. Caselli and Ventura (2000 as referenced by Barro and Sala-i-Martin, 2004).

Finding it, the ruling melody is thus that the representative agent shall freely have a constant intertemporal elasticity of substitution utility function over consumption of infinite cardinality range (Eq. 1).

$$u(c) = \frac{c^{1-\theta} - 1}{1 - \theta} \qquad \text{(Eq. 1)}$$

We guarantee you that the complete consumption $c = \frac{C}{L}$ will always be positive and out of this, it must be accepted that $\theta > 1$. This of the representative agent concave utility has a function which was used by Koopmans (1965), so that merit is his. This is, it will al*l*ow any one to look for reaching an opt*i*mal consumption rate $\frac{\dot{c}}{c}$ that has a constant influence of the market interest rate r over time depending on the value of θ, being this consistent with the continuity on C of the output composition for an implied technology A in the quality that it will still be. Further, it will ensure the property when $\theta \to 1$, that $u(c) \to \log(c)$.

As is popularly well known by the says of Barro and Sala-i-Martin, the utility maximization to plan consumption over time was first done by Ramsey (1928) , and later improved by Cass (1965), and Koopmans (1963). So it will be fair to go on with the fact that we are to obtain the decentralized solution of the very basic maximization problem with the Appendix A procedures.

If there were a ents who borrowed from others at higher rates than $r = R - \delta$, then we ensure that would not be too many such that r shall always be the perfectly competitive market interest rate, where R are the yields of the for the common best growing or stagnant capital .

In these harmonic chapters we will attempt to represent how the government, happens tobe, extremely important, by holding its role respecting the total production, and it will act as a social planner maximizing the utility spirit of the representative agent, which means that it shall thus always contemplate the population equally as the average agent[15] . Moreover, the planner needs-has dictatorial attributions, for independently of how traditions look as well at it as such, it results a true science its capacity to plan the impact of the aggregate investments' decisions on the total production , an for therefore it is as well able to reach the optimum of Pareto.

[15]The government could complement the total production by looking to spend in an opportune manner considering the decentralized decisions.

CHAPTER 1

BASIC SERVICES DEPRIVATIONS AND ECONOMIC GROWTH

The theoretical contribution of Zhang (2015) is that "demonstrating that 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, which results rather as an idealistic spirit.

Our work is as well purely theoretical i.e. we shall advance under the lines of Wicksell's concern when writing that "The data are no longer sufficient to supply the required information. It would be necessary to undertake a more intimate study of the various kinds of commodities and of their relative importance to the individuals who comprise the community –in so far as such a comparison is at all feasible." (1898)

Agents look at getting basic services provision at their home without the need of having to incur in efforts to carrythem there.

In this chapter we will refer to the absence of access to sanitized water, drainage system, electricity, an natural gas as basic services deprivations[1]. Nevertheless, one is to say that the households stop having a basic service deprivation when they get access to it at their house, which in turn overcomes cases such as how "the world Bank data on

[1] Our analysis is limited to the access of the families and firms for convention, and we refer to this basic utilities as basic services to avoid utilitarian confusions.

improved water sources do not reflect the distance of the improved source. A household with an in-house connection and one requiring walking a fair distance to a tube well would be treated equivalent in the data set, inspite the significant difference in access convenience." Steckel et al. (p. 116, 2017).

The supply of the basic services is possible due to the presence of public infrastructures[2] , which will allow us to represent its availability[3]. Given that these are not the only services which present such characteristic, we can afford to focus always on them, for as we shall always justify, are highly influential in the life quality of the population being used to cover daily basic needs.

The individuals' need for night lighting, heating, cooking, aliments conservation, as for other daily aspects, makes the deprivation of electricity and natural gas an important issue in qualitative terms for the households' life[4]. Moreover, the use of water what is not sanitized, or its possible sporadic total absence are a cause of bad health, which can impinge the effective labor[5].

As previously, we might as well develop defenses considering how when the public infrastructures that allow the access to a basic service are absent, the individuals spend productive time to find alternatives that could cover these needs, *like*ly reducing the decent amount of performed tasks during their life worked time.

The arrival of the possibility of the access to these services is a complex issue, for

[2]There could be cases where some basic service is not considered, because the necessary natural resources could be lacking for a region, and its capability to approach an access would not only depend on infrastructural investments.

[3]We are to demand that the representation rather focuses on the access to the sanitized water from the water tap which is not necessary drinkable, considering that this last specification which is necessary for human survival can be bottled to allow its consumption.

[4]See Unated Nations Development Programme (2016).

[5]At least due to its importance for hygiene and sanitation, and for further information see World Healt Organization (2016).

it depends on public investments that cover areas inhabited by many households, and never only on few personal income levels or on the general ones within a sub region[6].

However, Aschauer (1989, as cited in Steckel et al. 2017) point at the lack of public infrastructure *like* roads, piped water etc. as one of the main reasons for declining productivity growth in the US.

Examples of surviving economic growth models that describe a technological impact coming from the utilization of public services are Barro (1990), Barro and Sala-i-Martin (1992), Moon and Sonn (1996), and Barbier (2004).

Moving away from the previous examples altogether with the preceding defense, we build an economic growth model to represent how, these services consumption or utilization as inputs need not to improve the technology of the firms, however the pass from its absence to its availability does!

So we fundamentally pose the question to be answered that: *How can some regions have a basic services deprivations' persistence due to the absence of public infrastructures, or a slow pace of its decrease if there is an impact on the productivity depending on the access to these services which can be provided by the governments*?

As Steckel et al. (2017) recall, "the question of which factors determine the stock of a certain infrastructure or the extent of access to associated services has received *surprisingly* scant attention in the literature.". We look for explaining why poor governments under stagnation are not able to increase the infrastructures that give access to the basic services , even though such access has an impact on economic growth[7].

[6] Considering how in principle households with higher incomes are to these services.

[7] According to the United Nations Development Programme (2016), about 3 billion people rely on solid fuels to meet their basic needs, leaving several unmet needs. Moreover, the World Health Organization (2016) points out how in the year 2015 while its drinking water goal was met five years ahead of schedule, its target for sanitation was missed by nearly 700 million people.

Although this question involves the governmental actives, it will result essential to decentralize simple befuddled visions into a complex ordered frame, to allow certain more complete causality composition and thus, the satisfaction driven by a need for understanding for any positionally static in terms of interpretation member.

We represent this impact on economic growth, where our social planner is able to internalize the externalities of such access, and has the role of spending to allow its possibility. To achieve this we will develop two sections: For the first section our representation considers how a part of the population could be deprived even if the public infrastructures which enhance the access to the basic services were present in their local area, such that nothing could be theoretically said about the evolution of the corresponding deprivations. So it must be left to the second section the development of a representation of this impact, that introduces the music of a hypothetical public provision of a minimum consumption level of these services, which promises and guarantees this key access perception to its receptors.

1.1 Basic Capital Accumulation

We will implement all the growing previously introduced general principles for the part.

We define as basic capital, the provided part of the public infrastructures that has the capacity to allow the provision of a minimum consumption quantity of a basic service, for all the population within an established area[8]. We will refer to this minimum consumption as the covering point , which we accept to be equal, for each agent that consumes a basic service.

[8] This part complements other capital and labor in order to produce a basic service.

The covering point will not vary with the income of the individuals, and therefore denotes the consumption per person demanding a basic service which is met when the possibility of its access arrives in a local area[9].

Expanding the settings, the government is to finance the basic capital investments with *a* fixed non distorting tax *what* it withdrawals from circulation[10]. Ruling out any sort of mercantilism and the *like*, the basic capital investments are issued throughout projects that cover entire sub regions within the region of analysis[11].

The relevant scope in terms of our representation is such that the *cascade* of basic services firms could be cooperative, public, or competing firmswith the permitted use of basic capital. Moreover, we accept these excludable services' providers never to pay for the employment of the granted basic capital.

Individually of nothing, the presence of basic capital allows the basic services' firms to have access to the common technology. Thesefirms start producing their ordered covering points, renting the labor and capital capacity to do so. Further, this means that in order to increase the supply of basic services beyond the covering points within *a* populated area, only more private factors will always be necessary.

So we are to say that after the basic capital is invested, this equals to individuals inhabiting areas with installed basic capital who could start/stop demanding the basic service , and this will not add/diminish considerable labor productivity to impact the total production in question[12]. Moreover, this also means that as this *gr*avity is well propagated by neoclassical *gr*owth modelling so that we are posed at a well known

[9] Rejecting the equality of that covering point for each individual would not alter our results, however this for simplicity, is for later to be explained.

[10] The tax could be organized in a progressive manner to avoid distortions of the average agent.

[11] A country is the usual region of analysis e.g. Americas and England so as Mexico and Brasil

[12] This is consistent with the *law of large numbers*, which states that, microeconomic fluctuations will not affect the macroeconomic variables!

tradition, seconding the idea, the capital can stably mutate being always productively

adapted to it new services.

That meaning nothing but that the installed basic capital light will never adjust to supply simply commanded covering points of the services in question, and that the investments are to be irreversible. For we represent how the households within a sub region that start/stop purchasing basic services at any moment are to keep the general possibility of access when this kind of capital is present, and even if the deprived agents within a sub region are significant quantitatively .

In the critical composition, the basic services complementarity and substitutability to produce is hence, as the one of any other input in the economy which is not labor, and thus we are to let it be freely contained in the capital *li*ke in the black box revealed to Solow (1956).

One more time, the real merit of the infinitesimally comparable total output units Y is to be consumed C, invested I_K, or taxed I_B,[13] so the equilibrium condition $Y = C + I_K + I_B$ which can only be by us intertemporally properly readed as: for shmoos expenditures to be, shmoos income is necessary and vice versa.

Starting, provided such fertility, chiefly being closed a previous period equilibrium of real-money *like* shmoos exchange, the at the time static, allowing the following activation of the corresponding exchange of basic services stock, independently of w ho gets to earn or consume first, i.e. permutable basic capital stock B, will irreversibly represent our thus striking parametric spark of the access to say, these services in the black box (Eq. 1.1.1), where it participates as a non rival good. Its specific participation to produce these as remarked, so beneficial basic services, even though cannot be

[13] The guilt of this will be attributed to the bliss search through the Ramsey (1928) fashion. Moreover, do we clarify that possible donations will not be considered , and the same for voluntary labor when it comes to create and maintain basic capital.

found to be represented in the technology, however, as we have academically previously learned, will always be a kind of initial *public investment which allows these firms to have access to the common technology* , accepting that each unit of it has the capacity to allow the buying of a fixed amount of final output[14].

We accept that the adapted stock of basic capital gets just linearly discontinued at a rate δ. Since the basic capital is only used to provide the covering points of the agents, our accumulation of it has a naturally accounted maximum stock given by $\bar{B}$.[15]

$\bar{B}$ depends on the size of the population L: for a greater population, a greater stock it will have to be to allow the supply of such covering points. Moreover, this maximum stock is equal to $\bar{B} = \eta L$, where $\eta > 0$ is a provided exogenous *per capita* basic capital which is endogenously constant, and that is the thing allowing us the production of the personal covering points.[16]

An heterogeneous pool of *per capita* demands are not to be a fatal disaster to our common supply side simple addressing settings: for we assumed the size responsibility of the covering point that all are equal to the individuals , were we could instead have imposed a minimum consumption to represent the least quantity which should by each be consumed, in this way relieving such allowing of individual heterogeneity for these services. However, without quite altering any of our particularly proportional application results, we use, the constant introduction of across regional individuals' covering point, because we consider such relief, intuitive to establish directly a total individual access , which will avoid tendencies of for example clumsiness in representing

[14] This assumption means that B as K is permutable on its units with constant productivity, given the homogeneous labor firms. Additionally, it should be noticed that particularly B, shows constant marginal returns in allowing the production of the covering points.

[15] Extra capacity could be caused by competition for the provision of the basic services resulting in higher unexpected arrival propensities. .

[16] In reverse, the consumption of the covering points relatively indicates the cost demand elasticity for low levels of these services, at least for certain share of the population with its sparkling access.

the propper impact, being this fairly useful in the posterior section of the chapter.

1.1.1 The Model

a parameter that normalizes to 1 the maximum impact of the access to the basic services on the technology of the firms will multiply a usual Cobb-Douglas fit .

Each firm i enforced production yields putties-quantity as appreciated from (Eq. 1.1.1).

$$Y_i = AL_i^{1-\alpha} K_i^{\alpha} \left(\frac{B}{\overline{B}}\right)^{1-\beta} \qquad \text{(Eq. 1.1.1)}$$

All the firms having access to the same technology does not necessarily mean that all have equal access to the basic services, but instead that are able to survive having the average labor productivity. Since that as usual there is free entry i.e. perfect competition , for a gived B, so any firm i rents the available liquid *per capita* capital according to

$$\alpha\psi A k_i^{\alpha-1} B^{1-\beta} = r + \delta$$

where based on its yields k_i stands for $\frac{K_i}{L_i}$, and $\psi = \left(\frac{1}{\eta L}\right)^{1-\beta}$ is the part of the parameter representing the effect of the basic services deprivations in the one technology of the firms. In any case, thereby, all the firms look and match their capital labor ratio, and thanks to that we add each firm's output, to thus build what we firmly believe to be called the total production relationship of the economy

$$Y = \psi A L^{1-\alpha} K^{\alpha} B^{1-\beta}$$

To represent this is the one particular issue on how when the agents do not get access to the basic services can substitute them to produce, and thus, the effective labor does not depend entirely on our basic capital presence, so the acceptance parameters of

these functions must always satisfy $1 > \beta > \alpha > 0$, which means that as from before, therefore equal to the corresponding popularly known character of the Cobb-Douglas, the aggregate output has a positive marginal product of labor .

And, where this might take us? our representation is to bring again great insights and in reverse, surprising improvements, but let us first work out based on the utility function (Eq. 1), so we can carelessly get say, the so known decentralized routine[17]

$$\frac{\dot{c}}{c} = \frac{1}{\theta}\left[\alpha\psi A k^{\alpha-1} B^{1-\beta} - \delta - \rho\right]$$

where exercising greater stocks of basic capital B would work out as rhythm incentives indeed increasing the interest rate because of the added productivity taste to the capital investments.

But lets keep a slim explanation. So the incoming fully employed *per capita* so stocks of capital or basic capital get first dually accumulated according to the as well seen in (Eq. Sys. 1.1.1) system of equations .

$$\begin{aligned} \psi B^{1-\beta} &= \frac{\dot{k}}{Ak^{\alpha}} + \frac{\delta}{A}k^{1-\alpha} + \frac{c}{Ak^{\alpha}} + \frac{I_{\frac{B}{L}}}{Ak^{\alpha}} \\ \frac{\dot{B}}{L} &= I_{\frac{B}{L}} - \delta\frac{B}{L} \end{aligned} \qquad \text{(Eq. Sys. 1.1.1)}$$

Our system is consistent with how "Infrastructure access levels typically trend only upward". (2017, p. 110, Steckel et al.). In the system of equations (Eq. Sys. 1.1.1), we can appreciate how the external music evolves at some rhythm where $\frac{I_{\frac{B}{L}}}{Ak^{\alpha}}$ are the independent *per capita* taxes deflated by the output without basic services deprivations. Looking ahead moreover, this temporal system states that the internal rhythm of the

[17] We get the following in the Appendix A that thus shows how to obtain this solution.

change on the exercised capital in the right side that depends negatively on the external one of basic services deprivations in the left side simultaneously.

Let us realistically focus in comparison on how avoiding digressions to solve the implied conflict between classes of state variables k and $\frac{B}{L}$, the social planner maximizes the as usually sophisticated Hamiltonian with finally c and $I_{\frac{B}{L}}$ as control variables , fancily given by

$$J = \frac{c^{1-\theta}-1}{1-\theta}e^{-\rho t} + \mu\left[\psi A k^{\alpha} B^{1-\beta} - k - c - I_{\frac{B}{L}}\right] + \nu\left[I_{\frac{B}{L}} - \delta\frac{B}{L}\right]$$

which *makes sense* but only while the maximum stock of *per capita* basic capital class is not accumulated, and we will arise this other matter later.

By solving the first order conditions of the Hamiltonian, we get the condition of the optimal investments for the social planner, which is given by equalizing the net marginal products of K and the $\frac{B}{L}$ classes

$$\alpha\eta^{\beta-1}Ak^{\alpha-1}\left(\frac{B}{L}\right)^{1-\beta} -_{\delta} = (1-\beta)\,\eta^{\beta-1}Ak^{\alpha}\left(\frac{B}{L}\right)^{-\beta} - \delta = r$$

After unclothing this actual growth system condition we get the equilibrium ratio (Eq. 1.1.2) that optimally considers the present competitive private interest rate $\mathcal{R}+\delta$.

$$\frac{B}{K} = \frac{1-_{\beta}}{\alpha} \qquad \text{(Eq. 1.1.2)}$$

As we can see, this rule of thumb (Eq. 1.1.2) states that we must always invest in the second best stock i.e. that's why some may find such investments for the less important stock in order to level up the contesting productivity relationship whose pact is independent of any utility parameters[18]. Un*like* the usual certain capital formation,

[18] Provided what Plato and Aristotle saw as the undesirable effects of economic growth, "their analysis

the access to a new provision could be the result of the decentralized population ordering it to the government, or could be the result of social planning, but in any case, for these profitable services, our investments on basic capital must be present. Moreover, for now and for a common good, we are to deal with the spark in question being always the visible equilibrium ratio (Eq. 1.1.2).

If $\bar{B}$ was accumulated for lower incomes than the ones of the steady state of the economy, although its marginal product would equal zero, it would be positive an increasing on k class if the last depreciation was not covered, which means, that the stolen improvements on the labor productivity given by the access to the basic services complement a thus higher production[19]. Moreover, academically looking at the marginal product of capital trending to zero with the k class accumulation, if a maximum of B class is accumulated, in order to maintain these due to irreversibility non-hybrid and well defined classes as close as possible to the ratio (Eq. 1.1.2), the government would tax in this way covering the basic capital depreciation.

Thus the system of equations (Eq. Sys. 1.1.1) leads up to the revolutionary following important result that comes from achieving the unity (the in there maximum parametric impact), giving sense to the one general equilibrium restriction

$$\frac{Ak^{\overset{\alpha}{\beta}}}{\delta\eta} - \frac{\delta k}{\delta\eta} - \frac{c}{\delta\eta} - \frac{\dot{k}}{_{\delta}\,\eta} \approx 1$$

the fractions of the taxes with obvious tributary implications. Completely from the first order conditions of the Hamiltonian that depends on the composed liquid capital k of

centered on the establishment of a relatively stationary state of economic activity accompanied by a reasonable standard of economic well-being." (see Madema, 2003, p.429), which makes our result on this say rule of thumb consistent with such view.

[19] This in turn means that K is already composed by elements such as a watermill and a windmill ("molino de Aires" in spanish).

the feasible social planner, we even get the fair *growth* rate of consumption (Eq. 1.1.3).

$$\frac{\dot{c}}{c} = \frac{1}{\theta} \left[\alpha \eta^{\beta-1} A k^{\alpha-\beta} \left(\frac{1-\beta}{\alpha} \right)^{1-\beta} - \delta - \rho \right] \qquad \text{(Eq. 1.1.3)}$$

The growth rate of consumption (Eq. 1.1.3) is equal for

$$\left[\theta \frac{\dot{c}}{c} + (\delta + \rho) \right] \frac{1}{{}_{\alpha} k^{\alpha-1}} = A$$

when $B = \bar{B}$.

When the stock of basic capital lower than its maximum $B < \bar{B}$, we even have the opportunity to substitute the ratio (Eq. 1.1.2) in the decentralized solution, and get that it is equal to (Eq. 1.1.3). Therefore, the decentralized solution can reach the optimum of Pareto , which means that a non distorting tax manipulation is the ideal to finance the basic capital investments.

The origin individual levels are given each by $B_0 > 0$ and $k_0 > 0$, and if $B_0 < \bar{B}$, we must accept that these levels satisfy the relativity visible equilibrium

$$\frac{B_0}{L k_0} = \frac{1-\beta}{\alpha}$$

to avoid the possibility of say uneven temporal natural disasters .

Being the depreciation part of any interest rate r, our system in its natural look for stability is thus even to basically guarantee that the credit market restricts all loans such that the usually powerfull transversality condition (Eq. 1.1.4) must be satisfied.

$$\lim_{t \to \infty} \left[\frac{B_t}{L k_0} e^{-\int_0^t r(v) dv} \right] = 0 \qquad \text{(Eq. 1.1.4)}$$

1.1.2 The Steady State

Even as a good deed, from the equality of the consumption growth rate (Eq. 1.1.3) sound, we rightly get too, that the steady state could be differentiated for it falling shorter or taller in terms of the steady level of this unique governed class B The first exercising location has a shorter steady basic capital rhythm such that $B^* < \bar{B}$. The second location gets to the one steady maximum stock of the B class, and to identify when there are steady basic services deprivations characterized by the lack of basic capital, we denote it by $B^{**} = \bar{B}$ . .

As a useful lesson we must first get to the steady state with thus a steady basic capital taste $B^* < \bar{B}$.

From the previous (Eq. Sys. 1.1.1) we learn that, the steady state is obtained at such necessary cost of making the growth rate of consumption equal to zero for all independently of shorter or taller, and between competitors pushing to the equal technology level, in our model direction the $\frac{\dot{c}}{c} = 0$ resource gets our best possible steady capital in *per capita* terms that looks as it follows

$$k^* = \left[\alpha^{\beta} \left(\frac{1-\beta}{\eta} \right)^{1-\beta} \left(\frac{A}{\delta + \rho} \right) \right]^{\frac{1}{\beta - \alpha}}$$

As we can see, in the face of a higher technological level a an increased steady stock taste would then take place at first glance due to a higher interest rate, therefore non-distortingly there would certainly be higher investments In what obviating α and β effects respects, a higher temporal discount of utility ρ would result in a certain lower k^* because this means that the agents prefer a say more uniform consumption over time, of invest less . In short, the previous impatience compounds indeed what our wing clerks proudly labeled as the from greediness welfare, weakly derived by Adam

Smith who in my opinion wasn't to succeed until the arrival of the acceptance and thus support of David Ricardo, moreover, the respective commitment strength in question became such that it caused the unemployment of many that would dare to profess the opposite[20] up to current times.

Without having to break or reject any assumption how ever, the scarcity of a natural resource would affect η , making need the normalization to be different at the time [21]: Since the negative impact of the households without basic capital in their sub region would be of the same gravity, to represent this lack time layer, the new normalization would imply the need for an increased A to compensate the higher η for these subregions strict heights. That is, in efforts to be fair moreover, we could expect the government participation even to invest to keep the access to the basic services instead of covering more sub regions , and in any case this means that the scarcity causes a lower access of the population to the basic services in the steady state , than that one which would have been reached without it and that thus affects negatively the steady levels.

For some air on the deprivations reached track, we substitute the steady k^* class sound and economic growth absence $\dot{B} = 0$ in (Eq. Sys. 1.1.1), to obtain the steady needs sadisfaction

$$\frac{B^*}{L} = \left[\alpha^{\beta}\eta^{\beta-1}\left(1-\beta\right)^{1-\alpha}\left(\frac{A}{\delta+\rho}\right)\right]^{\frac{1}{\beta-\alpha}}$$

Should we appreciate that by substituting this particular steady basic capital in the inequality $B^* < \bar{B}$, we are to get the impossibility condition (Eq. 1.1.5).

[20] see Keynes, 1936.

[21] i.e. making η to be relatively great again, this means that the sub regions which had the access would need more basic capital and capital to supply its current orders for basic services, and that the sub regions without it would also need higher stocks to supply the covering points, where the equilibrium spark condition is as well satisfied.

$$A < (\delta + \rho) \left(\frac{1}{\alpha}\right)^{\alpha} \left(\frac{\eta}{1-\beta}\right)^{1-\alpha} \qquad \text{(Eq. 1.1.5)}$$

Our impossibility condition (Eq. 1.1.5) means that if the certain technical level A is *r*ight bel*ow* certain th*r*eshold, the steady state has deprivations characterized by the absence of basic capital flow striking parametric spark .[22] Only to make this intuitive, we would *like* to assume that, the consumed basic services that are used as inputs are lower than the total valuated classes of non-distorting investments in question. In comparison, once there were basic services which could be directly consumed from the firms with the for some quality of providing them, we would also know that any particular network arrangement flow of consumption is lower than the total one

As you can see, the devoted investments of the distinguished classes K and B do not cause endogenous growth if given that the access to the spark is fully in equilibrium (Eq. 1.1.2), that one might informally frame as well parallel to the Wicksell's rocking-horse possibility[23].

Certainly it is natural that all in our model performance one might find, is technological levels that violates (Eq. 1.1.5), which make the one maximum possible stock of the class B to be accumulated, and as we have just appreciated, we now correctly denote the thus steady *per capita* capital in the taller location fairly based on the incoming double star output y^{**}.

After feelingshorter steady levels possibility wave we now get the merit of the moving forward to the steady level of the capital class in the second location relief that is

[22] This is consistent with the arguments of Howitt and Mayer-Foulkes (2002) and Feyrer (2001), that the emergence of twin pics in the world income distribution is mainly attributable to divergence in rates of total factor productivity growth rather than diverging levels of capital accumulation. Moreover, under these "Aires", this condition is as well named poverty trap condition, where the critical threshold is the term in the right to the inequality.

[23] Wicksel, 1962, p. IX-X.

following [24]

$$k^{**} = \left(\frac{\alpha \mathbf{A}}{\delta + \rho}\right)^{\frac{1}{1-\alpha}}$$

Comparing the B class steady level B^* vs the K class steady level Lk^{**}, we get that the cross-location differencess are propperly dictated by the share of the participation parameters. Considering the well informed participations α and β, i.e. that we are conscient of what the accumulations' implied property can right bring at least in terms of just income[25]. From the free of utility parameters ratio (Eq. 1.1.2), we know even that the classes that we work with, grow at the same rate before reaching the maximum stock of the B one . As a consequence when the maximum stock of basic capital is accumulated for lower levels than the ones of the steady state, the ratio of the capitals is equal to $\frac{\bar{B}}{K}$, that thus decreases at the fair improvements rate of capital-individuals' inflow accumulation[26] $\frac{\dot{k}}{k}$ until the entrepreneur business prosperity of one k^{**} is all fairly accumulated[27], possibly equalizing $\bar{B}$ at the level off.

Notice that our findings are consistent with Irmen and Kuhenel (2009) findings that growth-maximizing and welfare-maximizing expenditures shares coincide" p. 29.

Given that the scarce growable B class is of exclusive occupation granted by the government. In the following subsection we consider how the accessed spark could go further out from the decentralized optimal(Eq. 1.1.2).

[24] We get the steady consumption of the second location level c^{**}, in the Appendix C.2 .

[25] "As a result of the prevalence of competition on both sides, among the sellers and among the buyers, an aproximately uniform price for each comodity soon pervades the market. This price is the one at which supply and demand just balance. Such a Balance is only possible when the marginal utility is proportional to the price (ratio of inter exchange) for each comodity and for each individual who takes part in the market." Wicksell (1962, pp. 20) referring to the modern theory of value.

[26] Contrary to most of economic growth paths, local stability analyses such as the one of Park and Philoppopoulos (2002) that show the economy to jump immediately in a unique way to a long-run *Balanced Growth Path*, our model could easily be extended to show how remote this path is for any claimed as committed to grow economy.

[27] We release this rate by taking the logarithms of this ratio in per capita terms, and deriving it respect to time.

1.1.3 "Tequila shot" (About the Pareto Investments)

[28]As mentioned, painlessly think the governmental investments on this kind of infrastructures to play a key role, in allowing the by subregions achievements of one zero deprivations normative point which consider other daily aspects together with the deprivations of the basic services what as well we have even rushed to relate to some rocking-horse certain dynamic.

For stocks of basic capital below $\bar{B}$, let us assume a government facing certain participations implicating levels must responsibility[29], however this time with a higher priority for decreasing the depravations of basic services barriers which are prominently characterized by certain lack of public infrastructures entry. This means that equilibrium condition (Eq. 1.1.2) is violated or yet not satisfied for the spark such that

$$\alpha\eta^{\beta-1}Ak^{\alpha-1}\left(\frac{B}{L}\right)^{1-\beta}-\delta>\left(1-\beta\right)\eta^{\beta-1}Ak^{\alpha}\left(\frac{B}{L}\right)^{-\beta}-\delta$$

and thus

$$\frac{B}{K}>\frac{1-\beta}{\alpha}$$

Painlessly think assuming the human-government to invest according to a class ratio $\omega>\frac{1-\beta}{\alpha}$, since these investments would be taller than the non-human-government (normal) ones of the optimum of Pareto, thus this time rusher of growth of consumption (Eq. 1.1.3) would $a$ctually be too high while the one maximum stock of class B

[28]We name this subsection "Tequila shot" in honor to the "Tequila worm" figures of agency map across various conditions that show activation across cingulate cortex after a subject's own decision, and activation across cingulate cortex after the partner's decision in repeated trust games. Study underwent at Tomlin, D., Kayali, M. A., King-Casas, B., Anen, C., Camerer, C. F., Quartz, S. R, and Montague, P. R. (2006), "Agent-specific
responses in the cingulate cortex during economic exchanges," Science 312,
pp. 1047–50 as quoted in Lohrenz and Montague (2008, pp. 476-477) where it is still revealed how inspite of "roll back" from the last round to predict behavior standard economic theory, that predicts that investors will never invest for repeated trust games, that is not what tipically happens.

[29]Independently of the planner being perceived as a cooking for himself great Chef, or as an aware of the miracles of coughing outstanding Doctor.

is not reached[30]. Therefore, whether our spark stresses equilibrium (Eq. 1.1.2), the government faces a trade-off between investments resting in the decentralized solution and increasing these investments size according to a stressed optimum of Pareto ratio ω, which in reverse as we learned is specializedly oriented to reach the limit. When the dictatorial investments satisfying ω come from the government responding to the survival need for these services, this would mean there are individuals whos will in the spur of the moment sacrifice other consumption opportunities to get such acces level. Independently of the certain cause , one worked out steady state might also be known to have basic services deprivations characterized by the lack of basic capital class deepening on the technological level A, on other parameters, and even if the basic capital investments were all say, done according to a higher class ratio ω.[31] This means that depending on technology, the steady state can depend on t_0 that is the year of the ω fairly established by the planner rule of thumb, becoming the undertaking stocks policy.[32]

Lying on *ch*ange*s* on th*e* income distribution structure, there might as well be modifications of the orders for the access to these services, e.g. going backwards there could be new individuals increasing the proportion of the population with these kind

[30] In this case, we would also assume the initial levels to satisfy $\frac{B_0}{L} = \omega k_0$, to feasibly avoid the new criteria uneven natural disarters.

[31] ω is but possibly a way of reporting shaped adjustments costs, which according to our respected clercks Irmen and kuhenel (2009) would keep the economy from achieving the Pareto-Efficient growth rate, for the internalization not only of the public good, but of the governmental incentives to reduce adjustment costs as well would take place.

[32] Steckel et al. (2007) mainly "find positive outliers for water access in two sets of countries: (a) centrally planned countries (or countries that have been formerly been centrally planned such as the Soviet Union of former Yugoslavia), and (b) some Sub-Saharan african countries.". As they explain, "Countries in the first group may have high infrastructure access due to an increased focus on infrastructure investment an the under central planning, in combination with declining incomes for several members of the former Soviet Union after its dissolution (with lower incomes and constant level of infrastructures access increasing the likelihood of showing off as an outlier)." p. 112. Moreover, for the Sub-Saharan Africa, the authors suggest how indeed a number of factors such as governments, geography and multilateral cooperation to target water access, could have contributed to this issue. The authors as well mention how for infrastructure other than water, negative outliers can be found in Latin America and Africa.

of deprivations, which need not the access to be out of the equilibrium (Eq. 1.1.2) sadisfaction, affecting thus the one steady state. This means in reverse that if say the accounted proportion of individuals with basic services depravations given by the absence of our B class increases, the course to follow is the next: indeed this will be fully reflected in the firms prices, the *per capita* production, and thus, in the economic growth[33].

A way to implement ω is provided by contracting debt and a posterior implementation of Röhrs and Winter (2014) tax adjustments "designed such that debt reduction policies are supported by a majority of the population." where they find that "the majority of households suffers from reducing government debt in the short-run, but gains in the long run." p. 2

In the words of Röhrs and Winter (2014), "Aiyagari and McGrattan (1998) argue that the government debt helps to 'complete' markets because it facilitates precautionary saving. Issuing government debt might thus be an effective way to improve risk-sharing and aggregate welfare (Flodén, 2001, Shin, 2006, Albanes, 2008)." p. 1

In other words, closed such stressed fertility interval, there could be agents turning capacity stocks of state variables into consumption, but given the implied spark irreversibility, the airs of access to these services being out of the equilibrium (Eq. 1.1.2), means that as always the human-households could reach the usual optimum of Pareto. In any case , the observed revolutionary result , of this steady state so to speak, has a stable saddle path mechanism departing from the initial levels and quite satisfying the healthy debt δcovering transversality condition (Eq. 1.1.4), where ω could cause or not

[33]Notice that away from the limit in the multiple accumulation (Eq. Sys. 1.1.1) it is only implicitly assumed that the stressed sub regions which stop employing or investing in, this access, increase at a certain speed in comparison to δ.

permanent effects on the steady state depending on the technology A.

As a to a fast ball response, for certain twin satisfaction we can extend and cover considering in advance that though elegant and sophisticated, our representation must be always closer to any *like*ly reality that it supposed to represent once chosen as the best Taking into account simply how certain agents within a sub region might not quite present high enough personal capacity incomes such that they could not entry to demand a new access[34], so disregarding from this in the following section, we are to represent the B class impact on true economic growth for a secure full public provision of the covering points, thus doing all it takes to forge the one ring of all entitlements as a sequential super-pavlovian mechanism determining preferences, propperly corresponding to and relieving our stressed-question for hungry-thinkers.

1.2 Public Provision of The Covering Points

This section is to in a similar vein so to speak, overcome all incredibly unexpected flaws from the previous representation that do not fully seem to match all the arising reality, so please be patient, for we are different and must first represent the impact on the technology of the firms given by a hypothetical public provision of the covering points, where normally the rest of the basic services' consumption, is charged for the individuals [35]. In reciprocity, labor of hypothetical analyses are clearly important in terms of neutrality related to the useful part of modelling, and its real contributions are probably indirectly intuitively evidently, but never common to the usual explicit

[34] The government could never force them to demand the access to the basic services.

[35] We do not consider a complete or an unlimited public provision of these services, because their unmeasured exploitation would become possible. This is, we compensate for how the natural resources allowing this supply are limited in most of the occasions.

scale tradition, for as before even corresponding dramatic results shall proof a utility taste. In any case, the observable hypothetical feature mean that the full access to these model services is guaranteed to the households who receives the public provision of their covering point, and that they demand at least this minimum consumption.

So let us follow to build upon the according to the general settings frame, for as previously notified, it allowed us to get here; the models of this part. All will improve and we will also acceptthe credit market restricts loans such that the transversality condition (Eq. 1.1.4) that provides a high gravity point is satisfied. Provided this has the merit of overcoming the income distribution problem, for higher incomes should imply a better general life for anyone .

We took as ideal to filter by adjusting *a li*mited parametric change model where now B is the divisible flow of the covering points thus denoting the corresponding spark in the technology of the firms. Given that a higher population inflow would need a greater provision intensity to maintain a proportion of the households with one access, $\bar{B} = \eta L$ are the overing points of the entire population within the region.

K is the employed stock of possessed capital of the economy[36], and as would have been appreciated in the previous section, because of the evident conceivable nature of these services, our model provision for the households is done , gradually by sub regions.

An enlightening firm i sheds

$$Y_i = AL_i^{1-\alpha} K_i^{\alpha} \left(\frac{B}{\overline{\bar{B}}} \right)^{1-\beta}$$

where reaching the maximum parametric impact is normalized to *unity*. Again we cannot directly observe the specific complementarity with the provided covering points

[36] This usual putties capital would contain the produced basic services which are employed as inputs and are not part of the covering points.

of each firm, and the representation is a black box certainly equal when comparing it to the one of the basic capital class, with say the firms that are to survive in the economy.

Only to conceive it as more intuitive we completely restrict the provided to our covering , to be lower than the total production with the inequality barrier $\frac{B}{L} < y$.

As in the previous subsection we can obtain that for a given provision B, each firm i is found to rent $k = k_i$, and luckily we can aggregate all the registered individual outputs to get that we are again to drive a nice model

$$Y = \psi A L^{1-\alpha} K^{\alpha} B^{1-\beta}$$

where again $\psi = \left(\frac{1}{\eta L}\right)^{1-\beta}$ has the same merit in solidarity of properly explaining the pulling impact interpretation of the previous section. The provision of the covering points that makes possible this total output is given by a function of its share in the economy (Eq. 1.2.1) as puted in Barro (1990) for the general long run way, for what Barro and Sala-i-Martin (2004) acceptance explains to be the representation proper of the non rival public services' effect, that as we appreciate naturally misses our novel addition of the one deprivations' effect on all in principle symmetric organizations.

$$B = \left[\psi A L^{1-\alpha} K^{\alpha} \left(\frac{B}{Y}\right)\right]^{\frac{1}{\beta}} \qquad \text{(Eq. 1.2.1)}$$

The social planner that as part of his job gets privileged information[37] in the sense of being complete, uses it to deal with it's own Hamiltonian[38] with consumption flow c, and basic services' access $\frac{B}{L}$ as control variables, which as an intrinsic step is the

[37] see sect. 11.4, pp. 268 of Kemp (2003).

[38] This as well works with factors such as painlessly prospective building, where provided infinite identified goods that in turn make infinite perspectives (e.g. starting by first comparing the taste of tequila vs the one of a long lasting spirits' single malt, or vs the one of an albariño, before achieving each temporal composite), all with maximals that are thus the same (such intuition we owe to the formal part in our tradition of the now main clercks, Arrow and Debrew (1954)), leaving only some to focus from the distances calibration matter for the metric space, i.e. in our parameters contained.

following

$$J = \frac{c^{1-\theta}-1}{1-\theta}e^{-\rho t} + \mu\left[\eta^{\beta-1}Ak^{\alpha}\left(\frac{B}{L}\right)^{1-\beta} - \delta^{1}k - c - \frac{B}{L}\right]$$

As we can see favoring the Hamiltonian, our always positive from receiving utility adopted utility function does not directly depend on the covering points allowance, and this thus implies that we accept the provided possibly redistributing nature of this provision not to be welfare distorting in its utilitarian sum sense[39], or as the usual, to be socially stable[40]. Solving by the first order conditions, we get a certain optimal proportion of the covering points in the economy as a rule of thumb (Eq. 1.2.2).

$$\frac{B}{Y} = (1-\beta) \qquad \text{(Eq. 1.2.2)}$$

The observed condition (Eq. 1.2.2) comes from solving $\frac{\partial Y}{\partial(\frac{B}{L})} = 1$,[41] which in comparison with (Eq. 1.1.2) means that choosing the last $pr\,o\,v$ided u$n$it of $c$overing points favors incre$a$sing a unit of final product due to the added labo$r$ productivity. Mor$e$over, this one optimal substitutability rule of thumb (Eq. 1.2.2) simultaneously means that the social optimal proportion of the covering points is higher ,if this class B flows have a higher intensive participation β in the total production .

In reverse from our one optimal share (Eq. 1.2.2) the public provision (Eq. 1.2.1) and the Euler equation we propagate thus this quantitative theory of social planner choice obtaining

$$\frac{\dot{c}}{c} = \frac{1}{\theta}\left[\alpha\left(\eta^{\beta-1}Ak^{\alpha-\beta}\left(1-\beta\right)^{1-\beta}\right)^{\frac{1}{\beta}} - \delta - \rho\right]$$

[39] That the pain of taking the B equals its direct joy. For further discussion on the definition of social welfare see Bergson (1938), Atkinson (1970) and Sen (1973).

[40] Moreover the provided utilitarian device enhances ruling out the from past tales well known gold standard rule that maximizes steady state consumption (see Phelps, 1961).

[41] A similar condition is obtained also by Barro (1990) for the driven representation of the general impact of public services in as well some production (he employs an Ak model and a limitless parametric possibility).

whose provision could keep improving displacing previous ones up to

$$\frac{\dot{c}}{c} = \frac{1}{\theta}\left[\alpha A k^{\alpha-1} - \delta - \rho\right]$$

if this control variable of state was such that all deprivations in question were erased $\bar{B}$ then taking us towards the one steady state.

We have even, substituted, that one rule of thumb (Eq. 1.2.2), in the decentralized solution, only when $B < \eta L$, and thus obtained that, the one solution of the social planner is fairly equal, which means again that our model driver takes us to the decentralized solution that concentrates in the reach of the optimum Pareto .

In any order, an air plots classically dependence on a stable initial level of *per capita* capital which is given by $k_0 > 0$. Moreover, when it satisfies this ugly condition $k_0 < \left(\frac{\eta}{A(1-\beta)}\right)^{\frac{1}{\alpha}}$, this means that the initial rule of t oes not cover or compensate all basic deprivations .

1.2.1 The Steady State

Meaningless to say, as observed previously in the subsection 1.1 interpretable result, the steady state can be accumulated working out different locations depending on whether the B class provision covers them all or not. Moreover, when it comes to solving this problem, as an advice, as we did previously, so the relieving steady levels are labeled with a star * power if the optimal public provisions are left with deprivations, and with a double star ** power otherwise.

So in the following we get the stable state that allows Transferences with basic services deprivations.

By equalizing $\frac{\dot{c}}{c} = 0$, we first get the smart screen steady *state* for k and secondly

the B^* for the interior model levels (Eq. 1.2.3)

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

$$\frac{B^*}{\eta L} = k^* \left(\frac{(\delta+\rho)(1-\beta)}{\alpha\eta}\right) \qquad \text{(Eq. 1.2.3)}$$

This previous nice looking results on the provided thus irreversible stocks, which we report in a general way are never to undermine, and indicate that independently of the rule of assignation or sober mechanism of the scarce B, which could be for example random, the divisible group (Eq. 1.2.3) first allows to observe how can a backward usual A be freely updated by a great η, secondly states that the steady deprivations in question hence should decrease at the same rate of the K class accumulation so to say if it was to grow. Can it be seen that simply there cannot be one endogenous growth caused by the stagnant B^* and thus k^*L, and should a larger coverage η or depreciation plus impatience $\delta + \rho$, distortion or damage be compensated by A which yearns, an informed implemented *per capita* steady state

Thus for real flow matters, we can expect that pushing lower heights from above, by with incredible gravity easily substituting the dictatorially wished steady provision (Eq. 1.2.3), in the model inequality $\eta > \frac{B^*}{L}$, we get the incredibly sophisticated failure condition of that technology level over local particularities, for some steady state to gain an optimal spark with basic services deprivations (Eq. 1.2.4).

$$\frac{A}{\eta} < \left(\frac{1}{1-\beta}\right)^{1-\alpha} \left(\frac{\delta+\rho}{\eta\alpha}\right)^{\alpha} \qquad \text{(Eq. 1.2.4)}$$

It could be seen that $\eta \geq y$, which as quantitatively appreciated would impose that an autonomous big push to achieve the visible total covering is not feasible i.e.

it cannot be engineered in that time period[42]. Starting over, the financed provision of the covering points could be intensively unfeasible in the steady state, which means that relatively the in the following stagnant painfully focused condition is took to be satisfied

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

where away from **any** digression the technological level diminished by the impatience survival powered to the same potence or participation of the specific class of k plays a key role for coverage as ρ grows, and there is say a rain of possibly exogenous rightly deflated reasons to move away from this issue.

Safely the general one public provision of the covering points may result unrealistic in many cases, because the possibility of starting to charge or stop supplying these services only after the *cove*ring point has been provided, could be more very costly in real life. Considering this optimal natural selection danger and that normally this kind of public provision could take the form of a discount in the daily consumption, however the weakest point arises with the high gravity affirmation that for high enough income levels, there cannot be pulling basic services deprivations. Centrally therefore, we do not find one steal of productivity in say omitting to address the corresponding B *cove*rage role heights solution to a steady state, that in the cycles misses all basic services deprivations, and to avoid *forge*ting to get such resource, looking ahead it is fairly argued that such corresponding possible steady heights are computed by the section F of our Appendix.

"It has further been argued that correcting under-provision of the material founda-

[42]The inequality in the condition misses the strictly greater character only because of this too intuitively painful to challenge restriction $B < Y$.

tions necessary to fulfil basic human needs through expanded access to infrastructure for, *inter alia*, water, sanitation, electricity, telephony, education, and healthcare, should be regarded as one of the central aims of public policy" (Jakob and Edenhofer, 2014 as cited in Steckel et al. 2017)

To address our first chapter *question* as it yet survives, it happens to be fair to continue by extending our work to a broader analysis on the governmental impact on growth, and thus in principle, on feasibility for the hungry-thinker as in the next.

CHAPTER 2

ON THE PUBLIC EXPENDITURES AND ECONOMIC GROWTH

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

In order to clarify the visions and analyses behind the design of public policies, and therefore allow, a better planning in terms of the life style of a population , it certainly results important to look for , the explanation about how the public services in general can improve the technology of the firms, and thus, impact the economic growth.

Since cycling public services providers are firms, it is difficult to identify their impact on the total production, because their as the other firm's merit in the economy, is that outputs are employed for production or are consumed, and the specific vocation complementarity of each input which is not labor, is usually part of the permutably owned capital in the aggregate production[1]. "The fact that public capital is essential in the production process is easily justified in an aggregate macroeconomic model: private firms need at least some basic infrastructures to bring their goods and services"Tavani and Zamparelli (2016) "to the market."

As we are chiefly framed or brought to addressing the just mentioned from the general neoclassical growth settings by Barro and Sala-i-Martin (2004),[2] they say that

[1] e.g. Solow (1956), Arrow (1962), Jones and Manuelli (1990), Rebelo (1991), and Rosas-Martínez (2016b, 2016c).

[2] Robert Barro and his former Student Xavier Sala-i-Martin among others are stars of mainstream economic growth modelling.

the flaw of Barro (1990) that represents how the public services impact the labor productivity which together with the capital investments causes endogenous growth[3], is however, that this model does not consider the impact of the possible congestion of these services, and that also predicts scale effects, which is not consistent with the fact that there is little robust relationship between the size of the populations and the economic performance of the countries[4].

The same authors at the same work would later continue by renewedly introducing how Barro and Sala-i-Martin (1992) represent how when the income increases, the firms thus demand more public services, which can cause its saturation, and where it is superior for the government maintains certain share in the economy, thus matching better empirical purposes. A problem with this model arises if we consider need for these services a hardly predictable[5] Moreover although propperly justified their existing refined model does not consider how even though the public services can impact the technology of the firms more of them *ceteris paribus* need not to imply an improvement of the one technological level.

Devarajan et al. (1996) analyze how the composition of public capital can influence *like* economic growth, and after performing an empirical test they find that the developing-country governments have been misallocating public expenditures in favor of capital expenditures at the expense of current expenditures. *unlike* them, to that end we shall effectively develop mathematic*al* representations where the agency access

[3] Which is consistent with Sidgwick view on the governmental role helping the "machinery of transfer" where "This last instance provides a still more sophisticated case for governmental provision" Madema (p. 438, 2003).

[4] e.g. Barro and Sala-i-Martin (2004), Dinopuolos and Thompson (1999, as cited in Afonso et. al (2014).

[5] This is more obvious for the non excludable public services for example there could be here an increase of the levels of bad insecurity making so more defense necessary to maintain the technological level.

to the public services is the one w ho has an impact on the technology of the firms.

Irmen and Kuehnel (2009) provide an extensive survey of literature on the link between productive governmental expenditure and economic growth, which one is to majorly find incredibly inappropriate.

A short run empirical study on this impact can be found in Auerbach and Gorodnichenko (2012), where it is studied the size of the promised multiplier in question for recession and expansion times.

In this work to seriously deal the optimal participation of the state in an economy, and for the sake of limited preparation time, we are first to sacrifice some specialization thus in principle considering a given set of public services whose access has an impact on the labor productivity[6], which aswill fairly imply a limited parametric impact of these expenditures' on economic growth. So secondly To correct therefore, our mathematic*a* models sha*ll* have a broad domain in terms of heterogeneous geographical regions

.

Moreover, our models closely obey the Johann Heinrich Von Thünen laws whose purpose would later be reflected in the Nicholas Kaldor commandments for exploiting economic growth transition dynamics[7], therefore non-*surprisingly* matching better the now essential empirical tests for the 76 countries for which data on public investment were available induced by Barro (1990) who references himself at Barro (1989), provided that finding a positive but insignificantly different from zero coefficient of the influence of the public investments' share will be totally intuitive for us.

[6] A way to get an idea about the possible origins of the implied heterogeneity between regions or populations, lie in the Salvador Barbera's social choice studies on strategic voting manipulations in order to break the Condorcet paradox (See Jackson and Sonnenschein, 2011).

[7] For an introduction to the Von Tünen see Douglas (1948), and the Kaldorian list can be found in Kaldor (1957) as referenced by Barro and Sala-i-Martin.

The chapter is devoted as it follows: The one section deals with modeling the impact

of the excludable public services which are publicly provided. The second section in comparison accounts for two fully planned alternative models that represent the impact of the public investments on economic growth, differing only on the possible presence of public capital extra capacity, and as a closure a general subsection concerning public investments or expenditures implications is kindly provided.

2.1 Excludable public services which are publicly provided

"Aristotle saw the Market as a "creature of the state" (Lowry, 1987, p. 237)." Medema (2003, p. 429), where the hungry and the thirsty are considered.

In general we are responsible of representing how the excludable public services, which are publicly provided induce labor productivity, where for any given technological level after certain *per capita* provision is provided, no more of this productivity can be added. This means that there is a maximum quantity of these services which complements a given population to produce.

Examples of these services are given by public vaccinations, and by basic public education[8], where there is a demand relationship in common to these outputs because to provide more than a certain quantity of vaccines per person, or to give basic education more than once to the same individual naturally acknowledge further labor productivity increase inconceivable.

Cyrenne and Pandey (2015) focus on the long-run effect of equalization on the composition of government expenditures, so they use an endogenous growth model to examine such effect. Their main findings that equalization-receiving governments choose

[8] For a given stock of knowledge. Aghion and Howitt (1992) profess how the research and development improves the technology of the firms, which is why we could only consider the basic public education among these provisions, and with basic public education we fairly refer to that one that does not generate new knowledge.

a higher ratio of government expenditure on unproductive services to total expenditures than non-receiving subnational governments, although would in any case evidently be favored by authors at the very first screen and intake of poor economics Esther Duflo and Abhijit Banerjee, as well as even for socially aware postures as the one of Amartya Sen, Our models so far haven't allowed such perspective in question. However, our limited models do allow for coherence on perspectives as the one of Chatterjee et al. (2012, as cited in Cyrenne and Pandey, 2015, first sect.), that "foreign aid crowds out a large fraction of domestic government investment. Moreover, one must say that this implies certain convergence enforcing, where it becomes evident who needs provision and who is in position to give it, where we though modelling under a closed economy, might as well fairly notice how for Cyrenne and Pandey (2015) "The estimated coefficients for the timetrend , indicate that while unproductive expenditure share has not changed over time, the productive expenditure share has increased.[in Canada provinces]" p.324

Where as a sort of conceptual convergence, during the rest of this work section we label the exclusive and publicly provided public services in question, just as public services.

The survival of a provision below the maximum provision would mean that more persons can be covered by these services, or that there are provided services of this kind which can increase its amount per person, always adding labor productivity .

"Dutt (2013) Develops a Keynesian growth model where public investment enhances labor productivity growth, thus producing long-run positive growth effects. The paper however is not concerned with income distribution" Tavani and Zamparelli (2016)

The public provisions that we deal with, are excludable because they have specific

receptors as an objective[9]. Moreover, although the planner of these valuable flow reassignations could monitor, and provide with different objectives, we do not consider such kind of public campaigns[10], and as we have previously mentioned, *unlike* others we only deal with public services which fairly addlabor productivity.

2.1.1 The model

We consider an exogenous finite set of public services which we take as constant over time. G is the public services financed with a fixed non distorting tax[11]. We include how the labor L varies increasingly at the rate $n > 0$.

The maximum fixed provision of public services per person is given by η, and we accept this by definition ordered flow to be positive[12].

The impact on labor productivity therefore has a limited parametric change model, in where, the continuous parametric impact of the public services on the technology of the firms is normalized to 1 on its maximum.

The total production of the economy is fairly given by (Eq. 2.1.1)

$$Y = AL^{1-\alpha}K^{\alpha}\left(\frac{G}{\eta L}\right)^{1-\beta} \qquad \text{(Eq. 2.1.1)}$$

To consider how the effective labor does not depend entirely on these provisions,

[9] A public program could have the entire population as receptors, with the personal reassignations being decided by the government, which gives to these services the character of exclusive goods.

[10] Barro and Sala-i-Martin (2004) provide a robust negative impact estimation of the public consumption which is not productive on the rate of growth.

[11] As in the previous chapter this tax could be charged in a redistributive way, where the average tax is thus charged to the average individual. Evenmore, the following note perfectly complements our devotion, yielding insights on overcoming applicability threatening dazzles: "And if the amount of taxes and of other receipts collected by the state (or municipality) remains at its previous level in spite of the fall in prices, the temptation to some degree of government extravagance is generally inherent, and is seldom resisted with suficient force." (Wicksell, p. 3, 1898)

[12] Exogenous increments of the proportions of the population which need public provisions, would therefore increase this η.

we accept the parameters to satisfy $1 > \beta > \alpha > 0$, which essentially means that the aggregate production (Eq. 2.1.1) has a positive marginal product of labor. This means that an increase of the workers does not have to be complemented by public provisions to inspire the total production[13]. Moreover, can this be informally filled, as a result of the alternatives willed, to these public provisions making, them dispensable in any breaking, of the dearest darkness of thy absence; marginal product of labor.

For simplicity we naturally assume that, the public provisions of the social planner, are divisible. To consider it more intuitive we restrict the public personal reasignations to be lower than our tonal income $Y > G$, which means in turn that there can fairly be positive investments and consumption.

The appreciated provided level of public services which allows that parametric impact on the labor productivity to produce the output of the equation (Eq. 2.1.1), is the following

$$G = \left[AL^{1-\alpha} K^{\alpha} \left(\psi^{\beta} \frac{G}{Y} \right) \right]^{\frac{1}{\beta}}$$

where $\psi = \left(\frac{1}{\eta L} \right)^{1-\beta}$, and at its time this means that the pushed unprovided ruggedly multiply the total output such that a given provision's ratio's effect on the very provision gets worsen and we call this the discord effect, which non *surprisingly* has led to some tendency to theoretize in what corresponds to in cycles stable η poverty traps[14].

When we consider the flow of basic public education within these services, we also work safely under the setting of a single period living of the households, which means that this service is therefore a *per capita* provision that must be matched at each moment in order to keep its impact on the total production, *unlike* the k class.

[13] This also means that we do not permit possible states, of emergency spreads which could make necessary public provisions to allow the existence of effective labor.

[14] e.g. Galor and Zeira (1993) and Sánchez Carrera (2012).

The departure levels are given by a finite constant $k_0 > 0$. We accept that the credit market restricts loans such that the in principle still of high gravity transversality condition with finite labor L_0 growth (Eq. 2.1.2) is satisfied[15].

$$\lim_{t\to\infty}\left[k_t e^{-\int_0^t [r(v)-n]dt}\right] = \mathbf{0} \qquad \text{(Eq. 2.1.2)}$$

As we have targeted in the general settings for this part, the representative agent has the always from receiving utility function (Eq. 1), and since the labour is not constant, instead of assuming a positive temporal rate of discount of the preferences, we accept that $\rho > n$ to account for the taking place multiplyer.

The rational decentralized solution that responds to the provision incentives is

$$\frac{\dot{c}}{c} = \left[\alpha\psi A k^{\alpha-1} G^{1-\beta} - 1 - \rho\right]$$

The social planner maximizes the utility of the unboundedli performing or living average agent, and its Hamiltonian with $\frac{G}{L}$ and c as control variables is the usual obeying the new variation of n inflow inclusion. Further, *unlike* Barro (1990) where the governmental expenditures can enter the utility function which would allow certain projection of their growth path, and there could be a self interested government, as addressed in a further section of this work, we take for granted the certainty on the of their use nature (such as any received vaccines), of this provision to be stable, or not to activate some welfare distorting alarm in its utilitarian sum sense.

As we pleasantly wake up the first order conditions and solve, we get the optimal proportion of the public services in the economy (Eq. 2.1.3).

[15] This meaning that the character of our exogenouse labor health *like* provisions does not ensure the small open economy property satisfaction found under endogenous labor supply and adjustment costs, that an increase of the steady state government productive share rate is to increase leasure (see Irmen and Kuehnel, 2008 pp. 25)

$$\frac{G}{Y} = (1 - \beta) \qquad \text{(Eq. 2.1.3)}$$

To evade any sort of carelessness, say this so unique condition (Eq. 2.1.3) obtained by Barro (1990) in a generalway, again means that these governmental expenditures have their optimal where $\frac{\partial Y}{\partial \frac{G}{L}} = 1$, which states the rule of thumbs as a governmental free entry where the last unit of these services increases a unit of the fair total product. Moreover, this free of utility parameters last result as of the same nature previous ones, is even 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).

The unthreatened optimal social plan for the thus fairly undeveloped nation is

$$\frac{\dot{c}}{c} = \left[\alpha A k^{\alpha-1} \Psi - \delta - \rho\right]$$

and for the fairly developed is equal to the social plan corresponding to a Cobb-Douglas, function that would be found suitable to reality[16]

$$\frac{\dot{c}}{c} = \frac{1}{\theta}\left[\alpha A k^{\alpha-1} - \delta - \rho\right]$$

when $\Psi = \left[\eta^{\beta-1} A k^{\alpha(1-\beta)} (1-\beta)^{1-\beta}\right]^{\frac{1}{\beta}} = 1$ and therefore, socially the real participation of the provision to the work individuals, essentially implies that $\frac{G}{L} = \eta$.

As we can see, the condition (Eq. 2.1.3), will only be optimal while the optimal *per capita* income satisfies that $\eta > (1 - \beta)y$, for when the optimal *per capita* provision is equal to η, an increment of these public expenditures per person would further

[16] See Cobb and Douglas (1928) and Douglas (1948).

labor productivity, and such critical point optimal solution would be to provide such *per capita* level even for higher per person income levels.

By substituting the optimal provision at the time zero in $\eta > \frac{G}{L}$, we get what an synesthetic optimal color perception can better describe the to homilize following condition, for further quantities might just hinder this objective

$$k_0 < \left(\frac{\eta}{A(1-\beta)}\right)^{\frac{1}{\alpha}}$$

which states, the flag on whether the origin of a nation is to be underdeveloped or not.

It can be verified that as in the previously observed thus comparable chapter, the decentralized solution is equaled by the one of the social planner, and thus, we can always substitute the now usual optimal ratio (Eq. 2.1.3) in the developing solution to get the optimum of Pareto .[17]

From the growth of consumption we can know that the steady state could be in two different locations, depending on whether or not the steady optimal provision of these public services is fairly equal to its maximum. We denote the optimal provision in the steady state by $\frac{G^*}{L}$.

The steady level of *per capita* capital for just developing nations $\frac{G}{L} < \eta$ is obtained through equalizing to zero the growth of consumption in that location, and it academically implies the movility capability as claimed by (**??**).

$$\triangle k_0^T = |k_0 - k^*| = \left| k_0 - \left[\eta^{\beta-1} A \left(\frac{\alpha}{\delta+\rho}\right)^{\beta} (1-\beta)^{1-\beta}\right]^{\frac{1}{\beta-\alpha}} \right|$$

As we can see there is not endogenous growth, and fairly in comparison the of

[17] The rules of thumb are therefore consistent with Röhrs and Winter ()2014, that "Different from Aiyagari and McGrattan (1998) and Flodén (2001), we also allow households to borrow up to certain limit." p. 4 for they later mention now "with a natural borrowing constraint and lump sum taxes government debt is neutral (Ricardian equivalence holds)." p. 5

constant sum *per capita* steady capital depends on the technology, level A; Since a change on the proportions of the individuals who need a new proportion of public provisions of therefore new total output to maintain labor productivity with variations of η, from the steady capital (**??**), we get that an increase of this proportions would decrease labor productivity and therefore result in a lower steady state. An example evident directional causality of this could be given by more *innovative* medicines to thus safely maintain, the labor produthe spread of a *new* drug addiction making necessary further public provisions *like* ctivity of the population[18].

The for utility (Eq. 1) colored optimal provision of these expenditures belongingto this steady state is

$$\frac{G^*}{L} = \left(\frac{\eta}{A}\right)^1 \left[\eta^\beta \left(\frac{A}{\eta}\right)^{\frac{\beta-\alpha}{\psi}} \left(\frac{\alpha}{\delta+\rho}\right)^\alpha (1-\beta)^{1-\alpha}\right]^{\frac{\psi 1}{\beta-\alpha}} \left(\frac{A}{\eta}\right)^{\frac{\iota}{\beta-\alpha}}$$

By substituting this divisible level in the inequality $\eta > \frac{G}{L}^*$, we get that the optimal provision of the public services in the developing steady state happens because (Eq. 2.1.5) iff is satisfied.

$$A < \left(\frac{\eta}{1-\beta}\right)^{1-\alpha} \left(\frac{\delta+\rho}{\alpha}\right)^\alpha \qquad \text{(Eq. 2.1.5)}$$

The issued condition (Eq. 2.1.5), means that the furnishing right parameters will allow a developing steady state to remain, which is up to certain point is consistent with Feyrer (2008), who notes the "twin pics" in the world income distribution is not attributable to divergence in rates of education levels, but to total factor productivity growth.

As fairly identified previously in section 1.2, autonomous big push to provide the

[18] this example the steady accumulable total capital would have to vary In!

public provision with the maximum parametric impact would not be feasible in a given period of time if $y \leq \eta$. Moreover, such big push would be high unfeasible in the steady state iff the condition (Eq. 2.1.6) was satisfied.

$$A \leq \eta^{1-\alpha} \left(\frac{1}{1-\beta} \right)^{1-\beta} \left(\frac{\delta + \rho}{\alpha} \right)^{\alpha} \qquad \text{(Eq. 2.1.6)}$$

Stably the discord effect disappears! for developed and thus basically educated nations, and that is, by equalizing their growth of consumption to zero, we vertically get that the steady capital question makes us run away to explain the levels' share of the Cobb-Douglas simple application.

$$k^* = \left(\frac{\alpha A}{\delta + \rho} \right)^{\frac{1}{1-\alpha}}$$

If possible, the optimal colored provision is equal that η for lower levels than the ones of the steady state, therefore, framing the *per capita* taxes which maintain the maximum parametric impact on the public services to remain constant with growth, where the optimal color ratio of these services and the total output therefore decreases with the capital accumulation. *unlike* that, since the set of these public services and the receptors' proportions of the region s can be 𝔡ifferent for distinct economies, the to 𝔠𝔩𝔬𝔰𝔢 optimal provision with the maximum parametric impact can always be reached at different income levels even if the technological level is fairly the same

Independently of its location, the fair state has a Buridain's ass path as well known as the usual stable saddle path[19] that departs from the origin levels and satisfies the transversality condition (Eq. 2.1.2).

Part or all of these public provisions can be given with the objective of erasing

[19] This is further explained in the next section.

the other deprivations which can be considered in the fair zero deprivations normative point of the first chapter[20], and thus, we again find that there can be a trade-off between increasing these provisions to achieve such normative point and remaining in our planner's achievable optimal color of Pareto for developing nations (known as the equilibrium), where in the real world the total output grows due to the effect of the workers' productivity on the firm's prices , and the total covering could as shown , be claimed unfeasible.

2.1.2 Fair Implementation implications

Demetriades and Mamuneas (2000 as) cited in Steckel et al. (2017) find positive effect of public infrastructure on productivity and employment. This is, our findings confirm how higher levels of infrastructure are related to higher rates of growth and lower economic equality (see Calderon and Serven (2014) and Straub (2011) as cited in Steckel (2017)] .

It has been this section of the work, the one which in principle happens to be nothing but some fairly conceivable meaningful non-randomized trial on productive governmental expenditures.

The order for assignation of these provisions that alter η, because it η could be the whole order with potential growing to a higher limit η, or the limit with a possibly lower order for it, where the demand or order for it, will for it, result in G permutations, could thus imply a mechanism in to guarantee achievement and equal productivity its[21], where the previously mentioned fair threshold of the basic education should be addressed in

[20] See the subsection 1.13.

[21] η is consistent with a point rightly stressed by Lehr as cited in Wicksell (1898), that "Two different composite comodities involve quantities which are not directly comparable"..."To decide whether food, drink, heating, lighting, have become dearer or cheaper in the course of years, it would not be suficient to know the various prices. It would at the very least be essential to be able to compare the different comodities in respect to their attrition value, flavour, combustion value."

further ordered studies, to avoid any possible misunderstandings. Moreover, the thresholds in question has also strong implications for the policy recommendations resulting from the analysis done in 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, such that the latter expenditures are necessary along the growth process[22]. Among other thresholds that concern the human capital and the technological level we can find the one that according to Feyrer (2008), is suggested by 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). Therefore can vary.

In composition, as Kemp (2008) puts it: "Perhaps one of the bigger differences is that ther has been more research within the narrower domain of health decisions, and the drawbacks and advantages of different decision -making methods are thus somewhat better understood within it." which basically says how can this need-not need of help be quite generalizable, but where we are to consider how constructions such as Tavani and Zamparelli (2016) that introduce a payoff function assigning weights to both growth rate of the economy, and the worker class after tax incomes share (As internalizing certain trade-off, which denies the positive effect of the public provisions on the interest rate and growth), a useless perspective, for it fairly lacks the essentials' of investing in humans as the concern of even the long run problem namely economic growth measurements[23].

[22] Being this in advance consistent with treating the public provisions as a flow rather than as a state variable!

[23] Irmen and Kuhenel (2008) analyzing the effect of a non-productive good for consumption which presents congestion, on economic growth, show that the degree of congestion enters the Euler equation reducing the effect of the discount rate on grwoth, the more public the good is. However our construction pretty much dismisses such possibility, where if any, fairly looking at such political hoarding effect on subjective interest, as rather some risk education effect which thus would better manipulate this model, by showing a purely binnary behavior as the certification of recession and expansion times by Auerbach and Gorodnichenko (2012).

This means that still for the hungry-thinker our approach pretty much discards Tavani and Zamparelli's result that "once the policy maker attaches a positive valuation to redistribution, the tax rate which maximizes its pay-off function is strictly above the growth maximizing tax rate, and the transfer turns strictly positive."

2.2 Public investments and economic growth

We represent how there is a positive impact on the technology of the firms given by the access to the public services . This impact could come, from the access of the households to the consumption of some public services, which would improve their labor productivity or, from the availability of these services to be employed as inputs for production

*A*mong the public services, we contemplate two different kinds: The publicly provided *which are not excludable*, And the excludable ones whose acquisition is *as the one of any other good in the economy* with the agents getting as much as the want.

A wide array of public services fairly fit in the set that contains the services with this fixed specifications . Possible examples of these services are: Firemen, police, garbage collection and sanitary landfills, courts of law, public transport, telephone, streets etc.

When no more new public services can be accessed even if more capital accumulation is possible for a given technological level, we will say that such region is in the limit of the public services' parametric impact, or that, it is in the limit. This does not mean that these services stop being productive, but instead, that after are available, are as any other input for production in the black box, part of the permutable capital, being utilized depending on each firm's specifications , where the households' consumption of

public services will be contained in the total consumption[24].

As is known by our representations' tradition, as a response to Keynes (1936) that "The effective demand associated with full employment is a special case, only realised when the propensity to consume and the inducement to invest stand in a particular relationship to one another.". To any of our clerks it should be now clear that our limit is full responsibility of labor supply, which in turn implies certain discipline envelopment in each forming part of continuity step that ultimately depends at the short run on the technological level, i.e. so to say, the discipline of achieving the general equilibrium.

In fact the following devotedly models how the government is able to internalize the externalities of the access to the public services, and has the role of spending to allow it, which can happen gradually because of the technological constraint.

2.2.1 The model

In this section the public capital or G class, denotes the initial public infrastructures which are issued to allow the to all always convenient public services' firm to access the common technology (Eq. 2.2.1).

The governmental class G is fueled with a targeted fixed non distorting tax[25]. *unlike* in a multi-sided Ramsey pricing problem[26], this sort of tax, jumps undesired externalities, and thus does not charge for the use of the public infrastructures to the firms utilizing them[27].

[24] Only few of these services could be directly consumed, like for example, the police.

[25] In alternative literature this is as well known as fiscal illusion. For some non-dictatorial interpretation see Heyndels ans Snoldens (1995); Misiolek and Elder (1988); Sorensen (1992) as cited in Kemp (2003, p. 268). In reverse as later suggested by Kemp (2003, p. 269) "Individuals tended to be more biased against a particular tax if they (mis)perceived themselves as paying more of it", which indeed would imply some mechanism for non-distorting taxes. In turn, a suggestion to fix this comes from Wagner (1976 as cited in Cullis and Jones, 2008) that "The more diverse the tax base, the more difficult it is to keep track of the tax-price."

[26] See Rochet and Tirole (2003).

[27] These infrastructures are utilized only by the firms which supply public services.

To look for ensuring the individuals' access, the government plans and does each investment on public capital thus, according to a *per capita* stock which is necessary to allow the *per capita* supply of each public service, that is demanded when the maximum parametric impact of these services in the technology of the firms is reached. This is, the per person invested public capital $\frac{G}{L}$ that allows the access to public services, will thus have extra capacity until this maximum parametric impact is reached, where the last accessed public service will be allowed by the *per capita* public infrastructures which have the capacity to produce its current *per capita* demand.

To avoid Ponzi chains, we accept that the credit market restricts loans, and thus the transversality condition (Eq. 1.1.4) must be satisfied.

Thus without going to the nonsense, the existing firms of public services will have access to the common technology (Eq. 2.2.1) without the need for more of these *per capita* infrastructures, at least while the maximum parametric impact is not reached.

The eq. assumption means that the supply of the available public services increases according to its demand, where the households and the firms demand this "now more global than the first chapter" engine spark of the economy[28] without saturation[29]

Only to make it minimally intuitive for a free interpretation, we accept that the individuals' expenditures on the public services are lower than their total consumption and investments at each moment.

We accept that each unit of the public infrastructures can allow the production of a unit of public services[30], and that all the units of the installed public infrastructures are always equally utilized. Therefore, its *per capita* stock indicates the *per capita* access

[28] See the subsection (1.1)

[29] Increasing this supply could be a consequence of governmental regulation over the firms producing these services.

[30] In terms of final output.

to the supplied public services in the economy, until the maximum impact is reached, where this stock will be fully employed.

As it is popularly done by many, we accept that the G class gets depreciated in the same way that the permutable K class at the same rate δ . Furthermore, a realistic feature on the behavior of the complete installed infrastructures, is that given the equal utilization of G and the rate δ, thus the depreciation of the public infrastructures causes a proportional reduction of the supplied public services even in the presence of extra capacity. In that order, we thrust the investments to be irreversible .

For a greater size of the population, a higher stock of public capital would be necessary to give *per capita* access to public services without saturation until the maximum impact is reached. In reverse, Because of this, in the total output (Eq. 2.2.3) the G class is presented as a non rival factor per workers. Therefore, the complementarity of the G class with the K class and work force L, to exclusively, produce a public service, is only horizontally indicated by them needing G presence to access the technology (**??**).

The public services' firms could be competing, regulated, or could be maximizing welfare, and for simple convention we accept that all produce under perfect competition .

Each owned firm i in the economy produces (Eq. 2.2.1) .

$$Y_i = AL_i^{1-\alpha} K_i^{\alpha} \left(\frac{G}{\eta L} \right)^{1-\beta} \qquad \text{(Eq. 2.2.1)}$$

We accept that the public services with the maximum parametric impact[31] are accessed when the G class is equal to the constant $\eta L > 0$. In the "Aires"[32] of central

[31] The public services which will be accessed for the given technology.
[32] This term means airs in spanish.

planning, *unlike* Park and Philoppopoulos (2002) finding that the optimal allocation of the collected tax revenues to the various public goods is independent of the state of the economy, our model thus implies the contrary at least while reaching the limit. The model has a limited parametric change, and the parametric impact is normalized to 1 on its maximum[33].

Although an increase of the labor force must be corresponded by an increase of the G class to maintain the value of the parameter inside the brackets in (Eq. 2.2.1) , as it should be known by now the agents do not necessarily need to access the public services to be productive, and thus, the usual participations claim applies satisfying $1 > \beta > \alpha > 1$, which means that the total production (Eq. 2.2.3) has always some marginal product of labor .

For given access to the public services, as is now tradition of this discipline, all the managed firms rent capital according to the condition (Eq. 2.2.2).

$$\alpha A k_i^{\alpha-1} \left(\frac{G}{\eta L}\right)^{1-\beta} = r + \delta \qquad \text{(Eq. 2.2.2)}$$

From the condition (Eq. 2.2.2) we get that all the firms and capital per head are thus matching such that $k = k_i$, which means that the non-distorting-designed investments on public infrastructures can allow the firms of public services to be competitive on the yields of capital with the rest of the firms in the economy.

By aggregating all the either individuals' welfare or productions of the firms, we even get the total output (Eq. 2.2.3).

[33] This implies that the local access to a public service will satisfy the law of large numbers, such that there is not a significant individual macroeconomic impact due to closeness, coming from keeping the eq. spark.

$$Y = AL^{1-\alpha}K^{\alpha}\left(\frac{G}{\eta L}\right)^{1-\beta} \qquad \text{(Eq. 2.2.3)}$$

Essentially the initial levels are given by $\frac{G_0}{L}$ and k_0, and in addition if $\frac{G_0}{L} < \eta$, we accept them to satisfy $k_0 = \left(\frac{\alpha}{1-\beta}\right)\frac{G_0}{L}$, which as in subsection (**??**) prevents us from the unfair redistributions due to uneven natural disasters, in principle provided the eq. spark (Eq. 2.2.4), and the interpretation of this condition sounds accurately as further later justified.

The Hamiltonian of our social planner as usual shows full empathy for the average agent thus maximizing the utility

$$J = \frac{c^{1-\theta}-1}{1-\theta}e^{-\rho t} + \mu\left[Ak^{\alpha}\left(\frac{G}{\eta L}\right)^{1-\beta} - \delta k - c-\right] + \nu\left[I_{\frac{G}{L}} - \delta\frac{G}{L}\right]$$

where the *per capita* taxes, felt to be used to invest on public capital are the issued control variable $I_{\frac{G}{L}}$. By inevitably solving the first order conditions we get that the optimal condition for the social planner is to fairly increase the G class to make it competitive with the K class

$$(1-\beta)\,\eta^{\beta-1}Ak^{\alpha}\left(\frac{G}{L}\right)^{-\beta} - \delta = \alpha\eta^{\beta-1}Ak^{\alpha-1}\left(\frac{G}{L}\right)^{1-\beta} - \delta = \mathrm{r}$$

and by solving this in return we even get that the optimal non-hybrid ratio of the interests conflict r .(Eq. 2.2.4)

$$\frac{G}{K} = \frac{1-\beta}{\alpha} \qquad \text{(Eq. 2.2.4)}$$

As in the section 1.1 of the previous chapter, the synesthetic condition (Eq. 2.2.4) does not depend directly on our utility parameters, where synesthesia, such as one of

certain brain mathematic interpretations as well matches this condition[34], and we may in general refer to it as the equilibrium. Moreover, his condition thus states that our government internalizes the externalities given now by, the access to the public services, and that it considers the market interest rate to optimally tax and invest on G class[35], where it should be noticed that althoug correlated, the leading G class is different than the public services[36].

The impact thus, mathematically optimal from the first order conditions of the Hamiltonian implies we get the savings solution of the social planner (**??**) that is implicit in the always and not just *like*ly present product exhaustion coming from the issued general eq..

$$\frac{\dot{c}}{c} = \frac{1}{\theta}\left[\Lambda - \delta - \rho\right]$$

As it happened with the B class of the previous chapter, when the governmental class reaches its maximum stock ηL, the growth of consumptions (**??**) is equal to,

$$\frac{\dot{c}}{c} = \frac{1}{\theta}\left[\bar{\Lambda} - \delta - \rho\right]$$

where the third world or developing countries' rate would equal the developed or that will develop no more countries, thus just only under the certain conditions that would make the distinguishable participations of the previous rate equations equal $\Lambda = \bar{\Lambda}$.

We thus can feel free to substitute the optimal classes ratio (Eq. 2.2.4) in the decentralized solution when, $G < \eta L$, and given that the social planers will continuously reach the optimum of Pareto, the growth of consumption will be the same for an imposed

[34] Conditions as this one have been documeted to be caused by head injury (see Brogaard and Vanni and Silvanto, 2012)

[35] This is consistent with how according to Braithwaite and Wenzel (2008), perceptions of unfairness, weaken moral obligation.

[36] For example, a classroom is different than a tuition fee.

decentralized solution[37]. *unlike* other taxes, this means that aiming the dart to a non distortion is appropriate to finance the investments on the public infrastructures and including the non excludable public services★

In this light we get that if the access to the public services is below the equilibrium (Eq. 2.2.4), then this access could increase and the population would thus improve.

Overall, η is the *per capita* stock with the maximum parametric impact of the public capital and it will be for sure accumulated, thus, we fairly assume that the parameters satisfy the condition (Eq. 2.2.6).

$$A \geq (\delta + \rho) \left(\frac{\eta}{1-\beta} \right)^{1-\alpha} \left(\frac{1}{\alpha} \right)^{\alpha} \qquad \text{(Eq. 2.2.6)}$$

The condition (Eq. 2.2.6), means that the level A is not inconceivable, or not that high that the fordwardly planned G class will always be able to accumulate the stock ηL.

From equalizing the consumptions', growth to zero for the non developing countries, again even the k states remain steady in the well Cobb-Douglas behaved mathematical economy

$$k^* = \left(\frac{\alpha A}{\delta + \rho} \right)^{\frac{1}{1-\alpha}}$$

Threatening this level, we openly find different reactions to our possible ways, *like* the possibility of fluctuations or jumps coming from each distinct parameter, where fairly as a closure we thus get to the absence of endogenous growth. *unlike* Irmen and Kuhenel (2009) that find scale effects so long as the provision of the public good has an

[37]Notice that we are distinguishing a given set of public services of whose access impacts the labor productivity, from the rest of the goods in the economy even if all the firms were public. This means that the extra capacity overcomes the by our clerks instituted quantitative intuition that congestion induces an incentive to over accumulate private capital (for a survey see Irmen and Kuehnel, 2008 pp. 12)

element of non-rivalry, our findings do not show such effects even with the non-rivalry of the non-rival parametric effect independently of whether the limit is achieved or not.

When the access to all the public services is not reached in the maximum parametric impact, or it is reached exactly in the steady state, then the optimal mathematical classes ratio (Eq. 2.2.4) is maintained until k^* is accumulated. Thus in such cases the maximum parametric impact on the technology of the firms is maintained if the depreciation of η is covered[38], and thus proudly the steady density of the governmental class in the population determines η,[39]

$$\frac{G^*}{L} = \eta$$

Moreover, the price of the governmental investments is[40] $\frac{\partial Y}{\partial G} = (1-\beta)\,\eta^{\beta-1} A k^{\alpha} \left(\frac{G}{L}\right)^{-\beta}$ and its participation in the total output is provided by the elasticity

$$\frac{G}{Y}\frac{\partial Y}{\partial G} = (1-\beta)$$

where as in Irmen and Kuhenel (2009), marginal product variations might need cross-subsidization, eventhough in regions of certain scale this might result illegal.[41]

Instead as we can homogeneously see, when the planed maximum parametric impact is equal to the limit, indeed after the η stock is accumulated for lower levels than the steady ones , therefore the mathematical equilibrium condition (Eq. 2.2.4) is never optimal to fairly maintain the limit share of the region.

[38] Which is as well optimal .

[39] For example more allowed steady defense per person will thus result in a greater size of η, which can be expected observable in across nations comparitions (see Harrendorf and Smit, 2010).

[40] If we move away from second-best optimal policies such as the one of Park and Philoppopoulos (2002), and just consider the previous footnote on non-distorting taxes, the Shapley value (Beyond for privates exogenous-endogenous public expenditures marginal products differences-adjustments, that in turn indicate wages to be recipients of the whole burden) constitutes a right alternative approach in order to optimally tax indeed.

[41] A land of opportunity which is academically consistent with the Uniform Rate of Return on Supply Price (URRSP) so exclusively first remarked at Walras's General equilibrium.

As previously took to say the so far developed, the public capital is only a part of the public infrastructures and although it stops being further accumulated, this time it is optimal for the social planner[42] to thus increase the public infrastructures to keep the access to the public services without saturation with economic growth[43], and we relatively explain this in the following.:

When the limit is reached for lower levels than the steady ones, φ is the new fair *per capita* stock of public infrastructures which is necessary to keep the access to these services without saturation at each moment, and thus, it satisfies $\varphi \geq \eta$. This *per capita* impact is always normalized to 1 in the production function. Its parametric impact on the total production is thus equal to the one that η has in the equations (Eq. 2.2.1) and (Eq. 2.2.3) when it is accumulated.

Each unit of the *per capita* public infrastructures φ will thus have a lower or equal parametric impact, than the one which each unit of the stock η of *per capita* public capital had until the limit of the impact was reached. Thus, the marginal product of the *per capita* public infrastructures if the last unit of the *per capita* stock φ was not covered, would be given by a marginal product of the *per capita* public capital before getting to the level η.

In principle, although the marginal product of the permutable public infrastructures is equal to zero, if its depreciation or its investments to maintain the access without saturation were not covered, then its marginal product would be fairly positive and even tend to infinity with the capital accumulation[44], which means that the available public services complement greater stocks of capital to fairly produce an improved production!

[42] which is now even equal to either the human and non-human ones.
[43] Keeping the limit of the impact.
[44] While the marginal product of capital tends to zero with the capital accumulation, which is the tipical Ricardian prophecy on property and taxes.

And hence, in comparison it will be fairly optimal for the government to maintain the parametric impact in the limit even when there is growth improvements[45].

Holding τ as the *per capita* taxes which finance the investments on φ[46].

If the steady state has not yet being reached, after the G class is no more, the k class changes following that system, of equations (Eq. 2.2.5).

$$\frac{\tau}{c} = \frac{1}{c}\left[Ak^{\alpha} - \delta k - \dot{k}\right] - 1 \qquad \text{(Eq. 2.2.5)}$$

$$\dot{\varphi} = \tau - \delta\varphi$$

where the change of the *per capita* public infrastructures by $\dot{\varphi}$ is exogenously given by the exhaustion of products, which can rather be tracked back to the endemic T$\hat{a}$tonnement of our tradition.

Thus we are implicitly getting used to that if in principle the steady levels are approached by a decrease on the total production, the decrease on the demand for public services is such that $|\dot{\varphi}| \leq \delta g$, where g are the public infrastructures which were accumulated the previous period, and hence this in exchange means that the ring of φ is always fairly accumulated.

In the (Eq. 2.2.5) case, aiming the dart to a fixed non distorting tax τ, *unlike* other taxes[47], autonomously causes the satisfaction of what we call the "collective understanding technological feasibility" in the following $\frac{\tau}{k^{\alpha}} + \delta k^{1-\alpha} + \frac{c}{k^{\alpha}} < A$ at least for a while. Moreover, we shall accept continuously the steady *per capita* public infrastructures to

[45] Sequentially *k*eeping or winning the marginal products of capital and of the public infrastructures as close as possible.

[46] It is important to distiguish that the governmental class is different than the public infrastructures that at its time are different than the public services, where as based on impact there could be an early correlation between these components of the total production, followed by the posterior dissapearance of the G class.

[47] As usual, the non-distorting tax refers to the devoted claims that it doesn't switch the neoclassical growth rate.

satisfy the next condition

$$\varphi^* < \left(\frac{\alpha A}{\delta+\rho}\right)^{\frac{1}{1-\alpha}} \left(\frac{(1-\alpha)\delta+\rho}{\delta\alpha}\right)$$

what guarantees a steady possitive consumption .

We get the steady consumption corresponding to this sections' different possible steady states at the Appendix D.1.

The ratio of public services to output which maintains the limit of the parametric impact before the steady state is reached is thus given by $\frac{2\varphi}{y}$, and as we can see, this share matematically changes according to the products exhaustion to fairly keep them without future saturation[48]

> In any case, even the steady state has a stable saddle path departing from the initial levels which satisfies the transversality condition (Eq. 1.1.4). Moreover, this as usually essentially means that the transversality condition makes the consumption to be in the saddle stable path, independently of η, and even with the uprising τ.

If we considered the case exposed in Barro (1990) where there is a self interested government with the expenditures in question entering the utility function, the limit and the in avoiding Ponzi games justified transversality condition, would imply a natural end for the initial dynamic taking out the social planner after it is to reach $\bar{G}$, where thereby $\frac{\dot{G}}{G} = 0$ is thus satisfied, imposing a new constant representative long run utility parameter. .

It is important to notice that we have assumed the public capital G investments to be done according to a certain mentioned stock, and that this representation with

[48] The merit of this plausible global ratio is that it predicts the public infrastructures φ as a kind of public service, and its capacity to produce population final public services

extra capacity points out how the government can invest on public infrastructures according to future capacities, even if the firms supplying the public services adapt its products , because it initially looks for guaranteeing this access, where as the firms it also later adapts it , and spending to build extra capacity does not have an impact on the technology of the firms. That is, A utilization rate of capital provides a model standard away from the limit model. This is, *unlike* Kaleckian models (see Tavani and Zamparelli (2017)), our present model therefore, is uncertain about extra capacity, which in such direction in turn makes our story extensively say, in contrast, less realistic intensive. We can thus instead represent this same impact with an extra and exogenously given non-distorting tax which maintains each access without altering our results[49]★ and such alternative representation is developed in the following subsection for the hungry-thinker.

2.2.2 Alternative representation of the public investments and economic growth

Our representation fairly accounts for that as Wicksell (1898) notices of an object's possession and thus merely its value[50]: "This importance *varies* according to the extent of the range of those wants which, beginning with the most urgent,

have already secured their gratification."

We take for granted all the general settings for this first part and the ones of the subsection 2.2.1, but those concerning specific details about the extra capacity or utilization of public capital, and that is, we may repeat some assumptions if we don't displace them during the development of this representation.

[49] Satisfying a constant full employment of the public infrastructures.
[50] When refering to a commodity as a medium of exchange.

The total production is given by (Eq. 2.2.7).

$$Y = AL^{1-\alpha}K^{\alpha}\left(\frac{gG}{\varphi\eta L}\right)^{1-\beta} \qquad \text{(Eq. 2.2.7)}$$

To represent how the effective labor behavior that does not depend entirely on the access to the public services, we accept that the parameters satisfy $0 < \alpha < \beta \leq 1$.[51] The fair in comparison access to all the public services which will be available in the region is reached when the *per capita* public capital is equal to $\frac{G}{L} = \eta$, which thus captures a Social-learning-all-hard-wired parameter.

The difference between this arrangement as well consistent with the Cobb and Douglas (1928) studies representation and the one of the previous subsection, is that the previous misses the arise of another class due to certain parametric need.

We again took the public infrastructures as giving *per capita* access to a public service $\frac{G}{L}$. This *per capita* stock indicates a non-rival parametric impact and we refer to G as public capital or governmental class.

For the available public services, φ denotes an anonimous mechanism namely the preassuring class of *per capita* public infrastructures which is non-randomly necessary to keep the *per capita* access to the available public services at each moment without congestion[52]. This stock thus increases exogenously according to the ideal as usual strategy proof T$\hat{a}$tonnement's products exhaustion.

g is the *per capita* class that is fairly claimed to maintain the *per capita* access to public services without saturation. Each unity of this stock is utilized to compensate one of the leading growth of φ, and thus the impact of the *per capita* stock $g = \varphi$ is always normalized to one multiplying $\frac{G}{L}$ as we can fairly appreciate in the total production

[51] This order is probably an implication of the housoholds heterogeneity.
[52] So as with the rest of the variables, for simplicity we omit the time and specific services sub indexes.

(Eq. 2.2.7).[53]

An early endogenous due to the general eq. result, is that the ring of $\varphi$is always accumulated with economic growth! Even when the steady levels are approached by a decrease on the total production we thus must accept that if there are public infrastructures which are used to keep the access to the public services without saturation and are not utilized get destroyed, and this together with the one supply equal to demand assumption means that the equality $g = \varphi$ is always satisfied. In this way indeed the constructed capital gets destroyed, thus *unlike* the usual certain δ punishment.

Distinguishing these irreversible classes allows us to include the services which can only be accessed by local inhabitants of a sub region in the considered set of **public services**[54], because the absence of extra capacity makes the stock of public capital not to attribute more possible *per capita* impact to the individual accesses in the sub regions which obtained first the availability to the same service of this kind.

Happily The prominent large numbers dynamic of the classes g, G and k is still safely given by a following system

$$\frac{c}{\dot{k}} + 1 = \frac{A}{\dot{k}} k^{\alpha} \left(\frac{G}{\eta L} \right)^{1-\beta} - \frac{\delta}{\frac{\dot{k}}{k}} - \frac{I_{\frac{G}{L}}}{\dot{k}} - \frac{\tau}{\dot{k}}$$

$$\frac{\dot{G}}{L} = I_{\frac{G}{L}} - \delta \frac{G}{L}$$

$$\dot{\varphi} = \tau - \delta\varphi$$

Where in comparison, the first eq. of the system shows the consumption to capital accumulation captivity $\frac{c}{\dot{G}}$.[55] Out of the mill of business composition, $g = \varphi$ has al-

[53] The coverture factor of this application of the limited parametric change model which is studied by the Appendix B, is $P = \frac{E}{L} G$ where $E = (gL)$. Moreover notice that P is homogeneous of degree 1 respect to G, L and E.

[54] See Tiebout (1956).

[55] Considering the well defined deflactor and the renewed rule of thumb.

ready been substituted due to the exhaustion as always implied in each timely closed macroeconomic eq. constraint, of irreversible spark investments and thus fairly invariable parameters. So preassuring class φ changes exogenously, and we can prevent that a "collective understanding technological feasibility" will this time take the infrangible form

$$\tau < Ak^{\alpha}\left(\frac{G}{\eta L}\right)^{1-\beta} - \delta k - c - I_{\frac{G}{L}},$$

$$I_{\frac{G}{L}} \geq \delta \frac{G}{L}$$

which means that governmental G, capital K, and consumption C non-hybrid classes per workers L, will as thus always normatively fine, not be suppressed.

The technologically observable fair decentralized solution is (**??**).

$$\frac{\dot{c}}{c} = \frac{1}{\theta}\left[\alpha A k^{\alpha-1}\left(\Omega\right)^{1-\beta} - \boldsymbol{\delta} - \rho\right]$$

where if considering the human-government vs non-human-government, from this Ramsey-Keynes rule i.e. Euler equation, we get what appreciated by Irmen and Kuhenel (2008) that "there is little reason why the steady-state growth rate should be arbitrarily large sinse faster economic growth has a cost in term of forgone consumption." p.6

In short, Thus we can now see that due to the minor addition of τ costs, the Hamiltonian of the social planner took the following form

$$J = \Theta + \mu\left[\Upsilon\right] + \nu\left[\Xi\right]$$

depending on the complexly evident drawable big terms Θ, Υ, Ξ. From the first order conditions one estimates that the optimal investments on G get to the observable flagged equilibrium (Eq. 2.2.4) and thus, to what empirically would be the matured classes's non-rival average interest enhancing growth.

Works shares such as the one of Kemp (2008) that admits the debate on the appropriate size of the government to be out of their scope, however, remark that possible misconceptions of tax and possible misconceptions of the provision costs are highly relevant to it. This powerful misconseptions are the ones we fairly take into account in order to define a shortest path through η. In this respect, as Kemp (2008) later interprets on his own, "attitudes towards particular forms of tax cuts not well formed in any event are easily unmoored" p. 270, which is something that is, a long run destiny not for the reaching η credential, but for what in fact is to abort, for it falls in what the cooperative game theory would wildly call dummy axiom.[56]

Concerning impact, a part from the eq. of aggregate time final exchanged fair accounts, independently of their large numbers belonging to aggregate costs or to consumption, always without waste, if φ was not covered, thus would academically affect the marginal product of public capital[57] G, and therefore, the rule of thumbs presses, as always the visibly optimal achievement for the government, to thus correctly grant the access without congestion instead of allowing the supply of more locking in congestion public services[58].

The innovative solution of the social planner of this alternative and improved section for developing and non developing or technological leader countries succesively is then

[56] The dummy axiom states that $f(S) - f(S \setminus \{i\}) \neq 0 \rightarrow \varphi_i \neq 0$ for some i that does not fall in the dummy state, where f yields the value of a coalition and φ_i the reward of the player i.

[57] Would be equivalent to diminishing the public capital due to essentially a reduction of the access to these services.

[58] This means so long that in order to invest according to the condition (Eq. 1.2.4), the stock $g = \varphi$ has to be accumulated at each moment, which therefore confirms the full ricardian endogeneity of this result. In reverse The words of Röhrs and Winter (2014) on comparing debt policies "In order to facilitate the interpretation, we compute the average welfare change in consumption equivalent units, i.e. the consumption that needs to be given to each household in order to make households indifferent on average between two specific policies." p. 8 might as well be the less querulous origin for the stable rule of thumb, which would result in a crime not to reference.

following (**??**[

$$\frac{\dot{c}}{c} = \frac{1}{\theta}\left[\alpha\eta^{\beta-1}Ak^{\alpha-\beta}\left(\frac{1-\beta}{\alpha}\right)^{1-\beta} - \delta - \rho\right]$$

what[59] fairly leads to

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

with levels which concentrate $\frac{G}{L} = \eta$.

This first result is consistent with the following: "Recent studies by Ramirez (2000), Ramirez and Nazmi (2003), Agenor and Macho-Dodson (2006) and Erden and Holcombe (2005), taking into account the distinction between developed and developing countries, have found clear evidence for crowding-in effects of public on private capital and stressed the importance of distinguishing between the main two components (productive and unproductive) of public capitals." (Bucci and Del Bo, 2011). However the second (corresponding to the usual Ramsey-Keynes rule) is not, for we have visibly distinguished between productive public services and extra capacity.

Taking the issue weather in terms of centralization as given, we again can obtain that as previously seen, the optimum of Pareto can always be reached[60]. Thus, essentially we can substitute the flagged ratio as a binnary choice in the decentralized solution[61].

The parametric impact has been fairly normalized in the maximum to simplify the

[59] An extension of this social planner solution to the presence of social preferences for equality can be found in the Appendix A, where *unlike* the previous ω regime (at the "Tequila Shot" sect.), the decisions in question are to be backed by the science of the one to one mathematic model, rather than as wrongly believed, by some dictatorial imposition that as we can see, is to take no robust place or be left as a loose end.

[60] A part from considering the dictatorial attribution of the planner, this result is as it should be well known by now, always justified by the Lange-Lerner solution (the usual Tâtonnement process)..

[61] The relative lack of good behavioral measures to value governments suggests that subjective ones be used instead (see Kemp, 2003), and we for some reason have based such valuation just on the marginal product of G that entirely depends on the powerful participations α and β, thus reliable, although we know that their presence is fundamentally anoying in the equations, at least while working with them in the getting results trial, independently of which one ends up weighing more.

expression to the steady state, and we could instead normalize it in the limit distinguishing a "newly defined cardinality of countries". Given the set of public services, we thus have chosen, the parameters to imply the satisfaction of the innocent from the past visible condition (Eq. 2.2.6).

The fair steady levels are thus innocently given now by

$$k^* = \left(\frac{\alpha A}{\rho + \delta}\right)^{\frac{1}{1-\alpha}}$$

$$\frac{G^*}{L} = \eta$$

$$g^* = \varphi^*$$

If the maximum density of the governmental class steady **budget** $\frac{G^*}{L} = \eta$ is accumulated for-through a k class that is fairly lower than the steady state k^*, *unlike* the other tax, only $\delta\eta$ will be covered thus **certainly** non distortingly bailing out the investments as close as possible to the Pareto equilibrium (Eq. 2.2.4)! as well fairly keeping the **??**] of the parametric impact[62], along the just improvements until the steady state. Permutably, in such case the changes on the stocks are thus claimed to follow the in the past also followed fairness system given by

$$1! = \frac{Ak^{\alpha}}{\delta\left(k + \eta\right)} - \dot{k} - \frac{c}{\delta\left(k + \eta\right)} - \frac{\tau}{\delta\left(k + \eta\right)}$$

$$\frac{\dot{\varphi} + \delta\varphi}{\tau} = 1!$$

where as previously, we are aware that *like*ly φ changes exogenously to mantain each

[62] To get to this result we must follow that scale alignments specified for measurement method in Kemp (2003), where he states "we should like a scale in which utility derived or felt by individual P from government activity could be directly compared with the derived by Q." to later complement stating "As we have just seen, two wilderness areas are not given twice the value of one." pp. 260, thus in that order suggesting concavity. Moreover, as Diener and Seligman (2004, as cited in Kemp, 2003) "regular national surveys of subjective well-being would be of enormous help in making policy decisions."

analyzed certain factorial impact[63], given its right management interrelations, not only *like*ly,...without extra capacity.

So in the limit, the merit of the steady *paid* consumption, as well as for the one of the other impact cases, for both are computed and shown there, belong to the Appendix D.2.

On the fundamental election of initial conditions per employee, given by $\frac{G_0}{L}$ and k_0 respectively, and we assume them to be positive and to meet solidarity i.e. thus to defense from the uneven disasters possibility (Eq. 2.2.4) with given respect to $\frac{G_0}{L} < \eta$. Moreover, the to thy ring corresponding level of the irreversible pressuring class which maintains the initial spark or secure impact at the moment 0, is faith tolerant given by φ_0, thus being positive, and free of showing a discord effect due to its character of state and not flow non rival-rival variable[64].

Again as is our tradition, independently of the steady state, there is a certain Buridain's ass path, conceives neither tending toward extremely high levels of consumption at the expense of all the capital class, nor to extremely high levels of capital accumulation at the expense of all consumption, which historically departs from the 0rigin levels that shall satisfy that liabilities transversality condition!!

As is well known, the depreciation punishment is always purely included in this models' tradition, such that its deviced consideration is quite mainstream blamed, nevertheless our introduced preassuring class could purely meet some precedent in Kalaitzidakis and Kalyvitis (2004) as referenced by Irmen and Kuhenel (2008), where capital

[63] These changes could get used to show an unstable patterns though for-through **s***harp* fluctuations to take place, the steady state would have to be absent, for as should have been noticed by now, φ^* implies a core of permisible compositions, which would otherwise result in a kind of nuclear disaster.

[64] See the subsection 2.1.1.

depreciates as some natural skin cells dead process[65], and the difference between replacement investments and actual depreciation is modelled.

Other of these fairness countires' resu*lts*, *like* the absence of endogenous growth and finally reaching the limit along Buridain's ass path thus basically , spring quantitatively as fairly equal comparisons to the previous ones (**??**)[66] for the hungry-thinker, and paretianlly in this "Aires", whether the limit of the parametric impact is reached or not depends on the available technology level!

2.2.3 The Public Investments or Expenditures Implications

*O*p to this point we have been working with private-public and private-public-press, common Cobb and Douglas (**1928**) style technologies that fairly present a limited parametric change. To do it safer or up to **certain point** understandable, I strongly recommend any reader to cover the Appendix B containing general properties and thus the general model applied to the so far developed, before going anywhere farther in this reading.

As it can be noticed, we have followed a certain tradition that we take from previous works on the engine sparks in question[67], i.e. practically it can be noticed, that therefore, thus not living a double life for example, each of the the fairly identified-

[65] 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.

[66] These persistent results in turn imply first the denial of the next "Externally late-nineteen-and twentieth-century economists saw the effects, both positive and negative, of widespread industrialization and increasing congestion. Internally the *tools* of marginal analysis made possible the *demonstration* of the potential failings of the system of natural liberty and, therefore, the possibilities of governmental policy actions for promoting, rather than diminishing, social welfare." Medema (2003, p. 437)

[67] e.g. Barro (1990), Rebelo (1991), Barro and Sala-i-Martin (1992), Devarajan et al. (1996) and certainly maybe even Auerbach and Gorodnichenko (2012).

accounted collection of equations {(Eq. 1.1.1),(Eq. 2.1.1),(Eq. 2.2.1),(Eq. 2.2.3)},{(Eq. 2.1.6),(Eq. 2.2.6),(Eq. 1.2.4)},{(Eq. 2.1.3),(Eq. 1.1.2)},{(Eq. 1), (Eq. Sys. 1.1.1)},{(Eq. 1.2.1),(Eq. 1.1.3)} among others with the same pattern, say to add a quantitatively considerable functional contribution, such that writing one and referencing it to each extension, would have affected important knowledge impacts of what was to fairly come in this very work.

Let us now in the "Aires" of Appendix B, take a jealous look at our growth equation result

$$\frac{\dot{Y}}{Y} = \left(\frac{g_P P}{g}\right)\frac{\dot{P}}{P} + \left(\frac{F_K K}{F}\right)\frac{\dot{K}}{K}$$

As we can verify, due to the *O*ptimal, or equilibrium, or rules of thumb, ratio, we therefore know that $\frac{\dot{P}}{P} = \frac{\dot{K}}{K}$, and thus independently of evading substituting the fine ratios in question, i.e. $P = \phi(K)$ or $K = \phi(P)$,[68]

$$\frac{\dot{Y}}{Y} = \left(\frac{g_P P}{g} + \frac{F_K K}{F}\right)\frac{\dot{P}}{P}$$

We get the endogenous change on the participation of the capital independently of its class, when considering that in the limit(s) the first term in the right side of the equality is null.[69] For stagnant and non-stagnant opinions, this is a prominent sophisticated result at least due to observed source and behavior explanations. That is, therefore our accounting results match well behaved, first, the Johann Heinrich Von Thünen laws that would later be closely reflected in the Nicholas Kaldor commandments

[68] Our early results confirm fairly the addition of Irmen and Kuhenel (2009) interpretation to Barro and Sala-i-Martin (1992, as cited in Barro and Sala-i-Martin, 2004) testimony that "In the flow case, since $G = \theta_G Y$, [θ_G is a constant share of income] the linearity in k holds at all t; in the stock case, since $\dot{G} = \theta_G Y$, this linearity holds only in the steady state." (Irmen and Kuhenel, p.37, 2008)

[69] In the previous applications this is observable in K changing its participation from $1 - \beta + \alpha$ to α, in the total production that already follows the previous behavior i.e. the decentralized Cobb-Douglas.

arrival, for economic growth transition dynamics[70],...

Moreover provided the latter[71], it is not surprising at all that looking at the 76 countries for which data were available empirical study analyzed in Barro (1990), given the permutable non distorting nature of a total derivative over the total production, we *thus therefore* know that indisputably our transition results do explain well as a sort of conceptual convergence, conditional, to a positive but insignificantly different from zero coefficient of the influence of the public investmentsshare[72].

As Calderón and Servén notice, "conclusions that infrastructures both rises growth and lowers inequality implies that infrastructure development may be a key win-win ingredient for poverty reduction." p.27, which as well is concluded independently by López (2004, as cited in Calderón and Servén, 2004).

This in turn reverses to how Eicher and Turnovsky (2000, as cited in Afonso et al., 2014) right "Introduce public expenditure and find theoretically that, in non-scale growth models, public expenditure does influence long-run growth "More recent studies, surveyed by Romp and Haan (2007), tend to be more consensual than other papers in finding moderate positive effects of public expenditure on percapita income and on economic growth."(Afonso et al., 2014)

Substituting or questioning the behavior of the consumers i.e. a non constant L,

[70] This in reverse implies the usual assumption of each unit to be equally productive independently of the moment of its investment, which our outstanding governmental representation has improved and replaced for alone the permutable capital property.

[71] As well consistent with how "The volume of infrastructure stocks has a significant positive effect on long-run economic growth." "In contrast the income inequality and growth appears empirically less robust, although this may reflect limitations of our quality measures or also the fact that quantity and quality are strongly correlated." (Calderón and Servén, p. 26, 2004)

[72] Bondonio and Marchese (1994, as cited in Kemp, 2003) find at Milan municipality that world government do not generally match their spending to the desires or values of the citizenry. Moreover, from this we can know that subjective surveys crash with the fact that empirical findings show the Pareto to be constantly achieved, which indeed is away from some Coasian bargaining fashion, as well holded and shown by this governmental finding of Barro (1990), which he interprets as public investments as done in equilibrium.

therefore thus given the Malthusian regime, we aside find the additional agents' inflow effect in $\frac{\dot{Y}}{Y}$

$$+\left(\frac{\left(gF_L - g_L F\right) L}{gF}\right)\frac{\dot{L}}{L}$$

where given that the productivity caused-attributed by-to the new agents F_L minus the new need-*like* unproductiveness g_L is usually for-through an F air i.e. higher levels of K and thus P, as in the applications of this second section of the chapter. and contradicting forces caused by higher stocks of the social classes of capitals can be found, namely a higher Y will behave diminishing the new inclusion bussines tendency prosperity, and against the tendency with an adjustment recuperation, increased stocks will thus behave at least compenzating the inflow of labor, which remarks the **constant,** need-*like* of the private-public-press or technology Y to finally claim in question factorial growths.

When having a good excuse to do it, hopefully aiming the dart to therefore, thus bail out the labor inflow in a non distorting way toghether with the savings k class prosperity obeying side as factors taked for granted, therefore thus one negative pre-assure shall dissappear in the limit left a certain investments' usually distinguishable K/L "questionably limited" burden.

Fair improvements on adjustments speed to get there, we *like* better as positionally independent employment of *arts* permutable support, to a sudden impplied in the utility (**??**) or welfare continuity[73].

[73] In contrast or *unlike*, Rebelo (1991) where the rates' evolution depends on preferences or/and the technology, it can be verified that the here mentioned effects will also be present in the evolution of the matching social rule for wages and the interest as it is for taxes (see the Appendix B) i.e., they shall be determined by the non-hybrid defined classes' reaction to the work force L increase, and thus of its bargaining power interactions namely comparisons between its fertile growths; $\frac{\dot{L}}{L}$ vs $\frac{\dot{K}}{K}$, $\frac{\dot{L}}{L}$ vs $\frac{\dot{G}}{G}$,

Independently of its definition, origin, composition, or domain, our intuition tells us that the nature of the public provisions that we dealt with are dependent on income *like*ly assignation. In reverse, that means that for example increasing the budget to luxury improvements of the life style of a governmental leader has always a *like*ly evident impact. Or the image improvement that increases investments success *like*ly confidence and prosperity. Heterogeneous regions productivity of *like*ly subfactors can fairly modify matching facts with evident impacts. Therefore stably, the still usual trade-off between utilitarian sum welfare and increasin the provisions in question meets an origin redefining *like* need.

The extra capacity thus away from basic education, denoted how the governments painting can dance some square plan on public infrastructures thus guaranteeing the future access to the public services without saturation, where this does not incentive the labor productivity *unlike* the representation of Barro (1990) that considered the possibility of an electorally unbounded government that maximizes its own utility, finding that it would charge beyond the optimal, and to evading this we must add the logically feasible comparison between the units of the permutable G stocks in the subsections 2.2.2 and 2.2.3, where it is fairly nondistortingly contributed that total incentiving public expenditures which are utilized to build extra capacity thus reduce the capital investments, and therefore, it takes more time for an economy with certain kind of investments to converge. To its steady state ! .

When it comes to best finding a representation, Barro and Sala-i-Martin (1992) find that a usage tariff would be ideal to avoid congestion for non-exclusive public services, and Tavani and Zamparelli (2016) find that "a simultaneous choice of a higher tax

vs $\frac{\partial(Lg)/\partial t}{Lg}$, etc.

together with a positive transfer leads to a more efficient allocation than levying first the labor share-maximizing tax rate and then redistributing." p. 462. Individually of this, despite the technological availability however, we could freely reject the assumption of eq., and after clarifying what would have been once been misconceived under that roof of network externalities[74] rather than as extra capacity, thus get the dynamic when the public services can present congestion![75] for the issued representation of the subsect. 2.2.3[76], where rejecting the rule of thumbs would be slightly up to certain point consistent with the previously provided, in that direction to show off the empirical result of holding positive but insignificantly different from zero coefficients of the influence of the public investments' evolving in time share, and this is left to the reader.[77] Another explanation for this last empirically based finding lies in Braithwaite and Wenzel (2008, p. 306) that "When tax law is as complex as it is, however, oportunities arise for finding loopholes and ambiguities, so that 'the arrangement of one's affairs, within the law to reduce one's tax liability' becomes possible..., in circumstances where such action is contrary to the spirit of law and...acomplishes the pretax objective'".

[74] For example of paper of Esfahani and Ramirez (2003) are mentions on how the infrastructures have network externalities, unlike the capital.

[75] e.g. Barro and Sala-i-Martin (1992, as cited in Barro and Sala-i-Martin, 2004), Eicher and Turnovsky (2000, as cited in Irmen and Kuhenel, 2009)

[76] That does not show parameter unit productive participation changes like in 2.2.2 after the limit accumulated.

[77] Proving how 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, is consistent with the limit as well as with the public provisions share influence related coefficient empirical result. Evenmore, this is as well consistent with non including directly the access to provisions in the utility as previously stated, however, if we further insisted that such decisions are directly utility based, an extension of the first section of the second chapter lies in an mutation of the utility on consumption c and leisure l from Irmen and Kuhenel (2009), $u(c,l) = \ln c + b_l \ln l$, where such mutation is provided by $b_l = \frac{G}{\eta}$ which is a a non-contractible and thus a non-internalizable effect, neither for the representative agent nor for the completely internalizer planner as well as for the sophisticated one, conceiving thus an accurate application to the randomized control trials "Aires" of Poor Economics, works exploiting frame which allowed Esther Duflo and Abhijit Banerjee the obtention of the novel price in economics. . As well an intimate general freedom-security considering utility function case (with distance from the governmental limit as directly entering in the utility determination) would be given by $u(c, 1-l) =. \frac{\left(c^{\eta}(1-l)^{1-\eta}\right)^{1-\omega}}{1-\omega}$ where we concentrate on freedom as an entitlement suitable with the thought of say, Amartya Sen, or Hayek.

If you reelect our devotion to undertake further great developments, a single model could contain all the public expenditure(s) which we have considered until this second chapter in less detail, and the aggregativeness of its effects-property would establish the right way to do the joint limit(s) representation[78]. For example a limited parameter that could present congestion is given by

$$\left(\frac{G}{\eta L}+\frac{g-\varphi}{\eta}\right)^{1-\beta}$$

where this technological availability means that g and $\frac{G}{L}$ are perfectly substitutable to maintain a parametric impact, and the *per capita* stocks which satisfy $g \leq \varphi$ have the described role of the subsection 2.2.3.[79] A trial to reconcile with what is summed up in Joan Robinson's phrase, "History versus equilibrium" (see Harcourt and Kerr, p. 349, 2003), if considering extracapacity as in this section, composes a parametric impact by a non-stochastic sequence of our fashion parametric impacts $g_{\varrho}(\frac{P_{\varrho}}{\eta_{\varrho}L})$, where $\varrho = 0, 1, 2, 3, ..., \bar{\varrho}$ indicates the ϱth parametric change. These impacts would take place such that if $T(\varrho)$ corresponds to the time when the ϱth limit is reached,

then $t(\varrho{+}1)$ is the starting time for the $(\varrho{+}1)$th parameter such that $t(\varrho{+}1) \geq T(\varrho)$. In that order, an example is provided by the parameter

$$\left(\frac{P_{\varrho}}{\eta_{\varrho}L}\right)^{1-\beta_{\varrho}}$$

where all η_{ϱ} satisfying $\eta_{\varrho} \neq 1$ would be called a Stockholm limit[80], and the others, just essential ones. Where a neoclassical devotion implies $\beta_{\varrho} - \alpha > 0$ innerly consistent

[78] An example of aggregation of what we would call multy social classes of capitals, can be found in a subtitutable essential factors way, in Devarajan et. al. (1996) who verify the governmental share effect over the specific cases of a CES function.

[79] Following Turnovsky as cited in Irmen and Kuhenel (2009), a *freed* from the *l*imit proposed government G leisure l production function is $y = A\left[G(1-l)\right]^{\alpha} k^{1-\alpha}$, though it isn't clear until we rearrange that $y = A\left[G - l(G)\right]^{\alpha} k^{1-\alpha}$ where if rearranging again we get $y = \left[A(G) - A(l(G))\right]^{\alpha} k^{1-\alpha}$, which in that sense is now in a better understanding scale, and that we for meaningful reasons have fairly left in the reserve army of models.

[80] Provided our extra capacities model, named after the opportunity areas for rules of thumb of macroeconomic dynamics left by the Stockholm school (see Dimand, p. 330 (2003) for a survey).

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)

Our model even accounts that if further limits are considered does not imply neither smoothing taxes (but discrete jumps), nor Lucas's conjecture that all equilibrium paths converge to BGP (see Park and Philoppopoulos, 2002). Moreover. if we consider the balanced growth path BGP that happens to be the *Status Quo* imposition allowing to close the growth system[81], results such as the Park and Philoppopoulos (2002) existence and uniqueness of the long-run tax rate and the allocation of tax revenues, are to lose all credibility.

Our findings obey the stylized facts as put in 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

[81] e.g. Park and Philoppopoulos (2002), Bucci and Del Bo (2011), Tavani and Zamparelli (2016)

the last 30 years." p. 2 without even the need for expanding our settings to an open economy[82].

Still our model has even dealt so far with carelessness concerns such as the one in the following lines expressed by Knut Wicksell (1898) closure: "I joy-fully welcome every fresh step towards the uniting of nations for economic or scientific ends, for it adds one more safeguard for the preservation and strengthening of that good on which the succesful attainment of all other goods, both material and immaterial, ultimately depends –international peace." p. 196

Until this second chapter results develop priorities converging in line with the in order as appreciated by Medema (2003) consistent precedents: "For both Greek and Scholastic writers, relatively extensive government activity was a necessity to create a harmonious social-economic order. Instead of an over arching theory of the state, there was a set of supposedly natural ordained ends that government could (should) assist society in attaining. In particular, the operation of self-interest was seen as promoting outcomes inconsistent with those prescribed by nature or by government; government action was necessary to prevent, or at least minimize, the more base impacts of self-interested behavior." p.430

Eventhough (in principle independently of the presence of congestion or extra capacity with flows) we have framed through the $\dot{k}$ constant sum dynamic, Tobin's q ratio, by fully implicating it until now, we didn't conceive including what must imply a shock to our devotion, in this direction, migrating as a family in the winter looks for refuge

[82] 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 a tax competition. Although this complements better the picture of Bucci and del Bo (2011), on the crowding-in effect of public on private capital.

at summer sun-light places.

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 common practice ended up classifying as the long run victory among our devotion. It would be fair then to say that the particular devices tradition to which we were and have as well brought the reader so far, eventhough we have included certain elements of a Leontief process in our permutable constructions (see Appendix B), 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 described 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.

This first claimed to fairly imply certain particular order of priorities, which one naturally is to feel fully part of a stable relevant guild[83]. Secondly, our devoted approach has completely left aside modern macroeconomics basic learning regimes such as (Case

[83]In contrast "Robinson, in particular, criticized the *aggregate* neoclassical, marginalist theory of distribution in which profits were the marginal product of capital. While the marginal analysis might work for a particular homogenious physical capital good and a single firm, aggregate capital was measured in monetary terms: the sum of the present discounted value of the expected profit streams of the phisical means of production of all firms. The quantity and price (the rate of discount) of aggregate capital must be jointly determined. Aggregate capital was not, then, the sort of independent quantity that could have a well defined marginal product, which in turn determined its rate of return, Robinson mantained that the very notion of aggregate capital was circular and absurd." (p. 414 Hoover) 2003

and Fair, 1997), which makes ideal to focus on revealing against the thus far oppressing imposed famous developed stubborn patterns.

Let us focus. The so far devoted to the limit greatly ignores some redistribution as if it didn't deserve our attention, as if it meant jumping from a cliff. We hope the following quote of Petri (2014) shows what we mean:

> "Garegnani (1960, 1990, 2008) notices, in an impossibility in general to satisfy the URRSP condition, which deprives Walras's system of equations of solutions, a problem that Walras finally perceived but to little avail, leaving his equations unchanged and admitting only in two added passages in the forth edition of his Eléments (Walras 1954, pp. 294, 308; 1988, pp. 401, 430) that, generally, some of the equations imposing the URRSP condition would have to be discarded – as if this did not question his entire system. Interestingly, Walras did *not* mention those two passages when, in the preface, he listed the changes of that edition, as if he had wanted them to remain unnoticed. And, indeed, they remained hardly noticed before Garegnani (1960)," p. 13

Let us further focus on how as noticed in Petri (2014)

> """a change in the relative exchange value of two commodities would give rise to a change in the value of capital" (Wicksell 1934, p. 202), admiting a few lines later that this implied an "indeterminateness" of the endowment of capital."" to which one can further glimpse how "several elements suggest that, while the belief in the right to treat capital as a single factor in applications remained dominant (it sufficied to think of the literature on

international trade and growth theory), in pure theory, confusions and uncertainties were strong and capita as a single value factor was not defended, leaving a void that had to be filled." p. 14

In reverse to the previous approach, let us exemplify what can be conceived out of the mainstream economics. When it comes to classes, Tavani and Zamparelli (2016) explain that "According to a well-established tradition in the non-mainstream literature (Kaldor, 1956; Pasinetti, 1974; Marglin, 1984), an explicit division of society between workers and owners of capital assets (capitalists) can shed light on the interaction between income and wealth distribution on the one hand, and economic outcomes on the other." (Seiz, p. 455-456, 2003)

Further, conceive the induced innovation hypothesis in which Kennedy (1964, as cited in Tavani and Zamparelli, 2017) states how "firms choose, myopically, a profile of technical change (g_A, g_B) so as to maximize the rate of change in unit cost reduction...under the constraint given by the IPF." p. 1284 where the IPF (innovation possibility frontier) inversely relates the attainable growth rate of labor productivity to the growth of the capital productivity. Where a Marx-Biased Technical Change (MBTC) $(g_A > 0, g_B < 0)$, according to Tavani and Zamparelli (2017) "is immune from the logical flaws of the neoclassical aggregate production function highlighted by the Cambridge capital controversy of the 1960´s," and that therefore, provides a lens through which the process of capital deepening overtime can be consistently acounted for.

Independently of the previous, the limit applied to free-nonfreeprivate-public designable mechanisms or governing social deviced contracts and its correlation in name, color and shape, *like* for any of the adapted models of the second sect.[84], it may be an

[84] An example of important mechanisms for social harmony and thus peace, can be given by the

important ex-post happening to remark how when fancying a sharp down in the total output, once aware of a parametric impact been reached, the government will outrun preserving it if the authority gets used to maintaining certain curtain, regardless the just location of certain levels, showing perhaps only constantly contradicting 'seasonal' tourist high extracapacity, which is thus as a whole basically consistent with data on access to public utilities (see Steckel at al., 2017).

So The best instrumental merit of the model is nothing but that it poses the limit. So far, we have as well to bail out the accounted fair spark impacts of factors which highlighted how the pressurable or non preassurable authority is important for the economic development of a region[85]. Finally, the popularly spreaded out well known shown autonomous big push impossibilities *unlike* the limit, thus become not to be thrusted as fertile results.

Given the absence of the ever living within any period growth,[86] we basically areto consider even an important achievement to explore the space of a specific kind of technological change which could take place, and whose causality is hardly understood as a direct result of a centralized control variable in some remote symple expression, for our LPC model is fairly a limited varieties model[87], exclusively in the composition of the following chapter.

As a closure for what we have developed until this second chapter for the hungry-

implementation of democrazy in the selection of applicable knowledge (Rosas-Martínez, 2016d) or by the ones against financial bubbles and corruption as exposed in (Rosas-Martínez, 2018) .

[85] For example when spending to avoid a contagious disease spread whose loci and remedy involve uncertainty.

[86] Technological changes are mostly vulnerable to the Cambridge controversy (but perhaps the ones of certain fashions as the one in Pagano, 2007), where as well seen as merely policy dependent are thus the too flawed ones given by trade and integration regimes (Lal and Rajapatirana, 1987, Grossman and Helpman, 1990, Vamvakidis, 1998, Rodrik, 2004, Madsen, 2009, Kilic, 2015).

[87] see Dixit and Stiglitz (1977) and Ethier (1982) both as cited in Romer (1987,1990 both as cited in Barro and Sala-i-Martin, 1992)

thinker, let us reference the 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

Part I

CHAPTER 3

SOCIAL PATTERNS **AND THE** TOTAL PRODUCTION

"Are you "trespassing" on my private property if you fly your private airplane ten feet over my roof? One thousand feet? Thirty thousand feet? There is nothing "natural" about where my property rights end and yours begin." Milton and RoseFriedman (1990, p. 30).

Well known trade-offs such as the one exposed in Barro (1990), that police taxes decrease property rights for police to insure property rights, are evidently fundamental in the light of the following precedent: Property rights "while viewing common property as the ideal (evidenced in communal monastic institutions), the scholastics believed that private property was optimal for society as a whole, owing to the negative incentive effects that common property provides for sinful, worldly people – a religious variant of Aristotle's position." Medema (2003, p. 430)

In this chapter we explore how social patterns can impinge the total production, which can explain one kind of at least certain ru^{i}n limitation for economic policy design, where the institutions are run by social individuals. The chapter is, from this perspective, a look for recognizing the nature and interrelations of the welfare of a society and collective behavior, which can take a policy to be less optimistic and more effective in defining and achieving its target. Therefore, this work is a trial to go beyond in studying and establishing the concerning very bases that lie behind the threatment of

the Behavioral Macroeconomics framework[1], under which we develop.

Engerman and Sokoloff (1996) suggest that the roots of the growth paths disparities among northern and southern American countires lie on its initial endowments, due to its influence on the evolution of societies.

Hoselitz (1963) mentions that mobility in the social stratification system becomes a must, when considering the functional requisites of a society with expanding and growing economic activities.

Rodrik et al. (2004) find that the quality of institutions as they put it, "Trumps" their other explanatory variables namely trade and geography, in determining growth where the geography has a strong indirect effect on it due to its influence on the quality of the institutions.

Moreover, an essential empirical analysis is done in Abbas et al. (2011) who perform an empirical correlation study using data from Pakistan, to add few factors and dimensions of gender discrimination which are responsible for the effect on employee performance or productivity.

Since the framework of economic growth[2], does not provide an detailed formal explanation about how the technology of the firms could be programmed or mechanically affected by social patterns, we came up with the commitment of developing the present work, therefore assessing theoretically such impact.

To keep our analysis symple and in a general scope, we are not focusing on ex-

[1] In contrast to the institutional evolutionary side that would be supported by authors like Punzo, Accinelli, Sánchez-Carrera, Sam Bowles and Ugo Pagano, we could consider the novel price speech of Akerlof (2001), that would propose the development of the behavioral macroeconomics branch under the Keynesian wing of the animal spirits, which inspite his as well emphasis on institutions and behavioral economics importance, took us to developments in an entire different direction. Furthermore, some recent attempts to develop or address this question can be found at Gabaix (2016) and Rosas-Martínez (2016a).

[2] i.e. the modeling tradition that we followed in the previous two chapters.

plaining the historical precedents of different particular social patterns that reign total producing. Therefore, we make use of mathematical tools such as topology which are meant to provide a clear and ordered understanding of the phenomena that we deal

, also allowing us the endogenization of elites formation.

This chapter is divided in three sections: The 'first section'(front) deals with how social patterns *like* power influence and discriminations in the hiring decisions affect the total production, and the 'second section'(middle) are the results of the imposed 'first section'. For the 'third section'(back) lies the explanation belonging to other ways, from which identifying social patterns, we draw how can the productivity of a region be affected, and a discussion

on the fair actions and policies that influence these behaviors over time is as well provided. Moreover, this section establishes properties that reach a fixed point in terms ofthese patterns, which has implicatedterms of a kindof technological change to get better the big film for the hungry-thinker.

3.0.4 Notation:

The following stage plays some of the notations which we will employ or reference at least in thissection.

- $\mathbb{R}_{+} = \{x \mid x \in \mathbb{R} \text{ and } x \geq 0\}$
- $\mathbb{R}_{++} = \{x \mid x \in \mathbb{R} \text{ and } x > 0\}$
- The closure of a set A is denoted by $[A]$.

- If a function is strictly increasing (decreasing) respect to a variable, for simplicity we will say that it is increasing (decreasing) respect to it.

The previous means that fairly during the chapter we employ set theory as it is usually utilized for coalitional game theory[3].

3.1 Social patterns in the hiring decisions and the total product

Although managerial tasks within firms can look for eradicating informal and formal practices to improve the productivity of the factors, we contemplate how all the workers behave according to social patterns which influence the hiring decisions.

This is, in order to develop that task of studying the total production, the relationship between wealth inequality and growth accounting

i.e. the welfare of a society, arises such that we shall endogenize the formation of exclusive groups which are

based on its members' wealth or attributes, *like* elites, as well also considering how the presence of a generalized discrimination of personal aspects such as sex, the race, or specific religions, can affect the hiring decisions and the total production.

To achieve such a complex goal, a matching problem is posed by separating job positions and workers, whichwill adequately incorporate the programming role of the social norms at the dance floor.

In this "Aires", Albrecht and Vroman (2002) model the matching dynamic between high skill and low skill workers and firms, endogenizing te firms' choice of requirements for a given workers' abilities distribution, thus explaining unemployment.

Great settings though Lain (2016), contructs a search-match dynamic model which

[3] e.g. Shapley (1953), Roth (1988), Sanchez-Sanchez (1993).

allows for individual heterogeneity and participation in both self- and wage-employment, as well as discrimination against female workers in the wage sector. By numerically solving and simulating this model, he shows that wage sector discrimination leads to average earnings gaps in all sectors of the economy, even if the underlying ability distribution is the same for both sexes, and he argues that this result arises because discrimination creates extra frictions for women, making it harder for them to select jobs according to comparative advantage.

Our approach will be fairly hybrid in the sense that aiming for the corner of the static branch of two-sided matching[4], allowing exclusively for one side coalitions, while leaving what concerns the dynamics to the 'third section'. Furthermore, this will lead us to orient our analysis not necessarily to wage gaps differentialsor to unemployment, but to the inclusion of the social norms' aftermath as a whole.

Eventhough this general representation of influence over the productivity of the factors portrays statically, our hope is that it results safely observable in or due to diverse evident historical contexts. Moreover, the generalizations that we deal to freely capture this impact, on the productivity of a region will in principle necessarily omit possible particular positions of ever lasting minorities under the collective norm regime in question.

3.1.1 **T**he total production

Just there are $n > 2$ adult individuals or potential workers in a region, and n to be filled profiles. $N = \{1, 2, ..., n\}$ is the set of the individuals in the economy, and $V = \{v_1, v_2, ..., v_n\}$ is the set of profiles.

[4] e.g. Gale and Shapley (1962), Roth (1982), Demange and Gale (1985), Balinski and Sönmez (1999).

Therefore each individual i occupies one profile position where he is to supply a unit of labor inelastically. In contrast with Albrecht and Vroman (2002) who would consider that a low skill work is the one that can be done by anyone, while a high skill work needs a certain specialization, we juggle our construction taking for granted that each of the supplied units of labor, has a different in a red light productivity which is a personal trait, and therefore, even the profiles have highlighted ideal labor productivity requirements.

Definition 1 *$P \in \mathbb{R}^n_{++}$ is the vector of productivities, with its ith entry p_i, being the ideal labor productivity requirement of the profile $v_i \in V$ and also the labor productivity of the agent $i \in N$. Moreover, the entries of this vector are ordered such that $p_i > p_j$ for any pair $i < j$.*

Therefore in this $p's$ to $v's$ ring there is certain freedom to for example fairly endogenize the productivities. Although there are just different proxies of the labor productivities *like* professional experience and thus more familiarity with the industry patterns, for some reason, maybe a matter of preference for modelling order, we shall consider directly the productivities' force instead of obeying correlations with other personal characteristics[5], or a given pattern, which will allow the development of this work, as well being the reason why we take each roughly achieved p_i as exogenously given.

We issue an entire financial scenario i.e. there are fixed and exogenous invested and composed endowments.

The firms could maximize benefits or welfare, and for simplicity we accept that all

[5] Such as initial wealth or a physical disability.

survive perfect competition means, i.e. the job positions with a higher ideal productivity requirement pay a higher competitive market wage, such that $x_i < x_j$ iff $p_i < p_j$, where x_i is the payoff from the profile v_i.[6] Moreover, the different wages for differently productive tasks, have implications for a learner firm that we clarify in the following example.

Example 2 *For a learner firm in the economy which is able to produce a final output renting or hiring three available different workers named* 1,2*, and* 3*. It faces marginal productivities of these agents*[7] *as* mg_1*,* mg_2*, and* mg_3 *respectively. The technology thus utilizes these inputs such that the marginal products satisfy* $mg_1 > mg_2 > mg_3$*, i.e. the perfectly competitive market wages*[8]*. Therefore, in this example a different hiring pattern switches the productivity of the factors, means that there is another technology which employs the same labor differently, where, the order of the wages as well changes.*

These antecedents implie many agents possibly having to accept some already noticed workers' daily inefficiency as part of this .

This unthreatening example means that each of all the firms has different behaving labor positions which must fulfill in order to allow a possitive production[9].

As is usual not only in economic growth frameworks but in the one of the cooperative game theory with transferable utility as well, for otherwise it would thus make not sense to form unions or coalitions[10], we accept that the utility of the workers

[6] This in turn satifies some main normative wages provision in the sense that they are to maximize the total product (This follows an intuition that sounds as further explained in a posterior subsection).

[7] In the technology of the firm, and these marginal productivities can probably be different than the productivities contained in P.

[8] The result of free entry and access to the same technology, where if a worker gets a wage which is lower than his marginal product, thus another producer could replace this firm by paying a higher rent for the workers.

[9] A representation of how a firm must fulfill different coordination levels in order to produce sounds as further provided at sect. 3.5.2.

[10] e.g. Shapley (1953), Roth (1988), Peters (2008), Sanchez-Sanchez (1993).

can be expressed with their wages.[11] Although the agents could be hired throughout decentralized decisions, independently of the given investments, for simplicity we deal naming the final occupied job positions as a labor assignation. Moreover, in the rest of the work we may, refer to the ideal labor productivity requirements of the profiles just as requirements.

In order to represent how the effective work in the total production depends in as much on an individual's labor productivity as in his job position's requirement, we use certain production function which allows us to capture how when an agent has a higher productivity than the required by his obtained job position, part of his potential gets be wasted, where if her certain productivity was instead lower than the required, then such job position would operate below its potential[12].

In this way, the production is justly expressed in terms of final product, and we just keep fairly taking its price as the numeraire. The production (Eq. 3.1) is given by a kind of non-Bayesian fixed proportions function, controling for possible changes on the effective labor[13].

Each agent i occupying a profile v_j produces

$$Y_i^{v_j} = \min\{p_i, p_j\} \qquad \text{(Eq. 3.1)}$$

This between limits arrangement election means that the individuals' effective work is equal to their supplied labor multiplied by the lowest productivity of this pair. Although only these individual productions do not allow us to certainly distinguish the

[11] We are to see that as Kemp (2003) says, "It may be that ordinary folk largely disregard the increased utility that may result from consumption possibilities, and focus instead on the utility obtained from employment."

[12] In contrast with Albrecht and Vroman (2002) that employ a function considering this aspects, our approach will take into account as previously mentioned the full potencial forces of the two sides.

[13] The production is not in function of the capital to address the issue on the two Cambridges debate , and its interpretation is even stated in what follows.

firms in the economy, or the participation of capital, we represent how when a worker occupies a personal prolife with higher productivity requirements, even the size of the difference between this productivities matters, which is freely captured in the decrease of the total production, and this fairly says that we can apreciate how far from its potential is the economy opperating.

Diminishing or increasing personal negative contributions of the productivity differences[14] to the total production, would only have evident qualitative results deriving in calibration issues. Even more, with the function (Eq. 3.1) we consider how an individual i with higher productivity than another one j, will always be more productive if is hired to occupy a labor position v_s with a high enough labor productivity requirement such that $p_s > p_j$.

For simplicity the job positions do not have any time consuming or slowing down friction or transition requisite which must be fulfilled to be occupied, and thus, any person is permutable i.e. could be hired in any job position[15].

As we can fairly see, this construction thus determines changes that belong to the well known discipline of labor economics i.e. as a whole there can be individuals producing more than agents earning higher wages, which thus disappointing means that a part of their production is perceived by the firms as produced by the agents earning more, and as we have previously mentioned, this is because for example, a governmental firm perceives that the labor positions with higher ideal labor productivities are more productive in practice as part of its technology. Moreover, these perceptions mainly result intuitive more contributory after we explain the so substitutable firms' rules to

[14] i.e. $\max\{\max\{p_i, p_j\} - \min\{p_i, p_j\}, 0\} \forall i, j$ because as it can be easily see , the division by two-sides makes this implied sum just what we are accounting for.

[15] The subsection 3.1.4 provides an extension which considers when the profiles require personal specializations of the individuals to be occupied.

select workers to hire them, which we will do in a many implied sectors followwing subsection.

There are n ! visible profile assignations. In order to get the total product of a labor assignation z where each agent i occupies the profile v_j, we are to sum all the behavedly distributed income. Moreover, this total production is given by the equation (Eq. 3.2).

$$Y_z = \beta_0 \sum_{i=1}^{n} Y_i^{v_j} \qquad \text{(Eq. 3.2)}$$

Proposition 3 *There is only one labor assignation producing the normatively efficient output $\bar{Y}$ which satisfies $\bar{Y} \geq Y_z$, for each $z = 1, 2, ..., n, !$. Moreover, this assignation is called normatively efficient labor assignation, and is given by each individual i occupying the profile v_i.*

Proof. It is easy to see how any deviation from the existing normatively efficient profile assignation produces a lower total or steals output, because at least one job position produces below its potential while the rest of the positions produce at most its potential. ■

This fairly means that all efective $p's$ arrangement is best welfare indicator, and thus, any deviation from it, a measure of evil. Moreover, for two labor assignations a and z with the productions Y_a and Y_z which satisfy $Y_a < Y_z < \bar{Y}$, we say or will say that the assignation z causes less normative innefficiency than a, or that z is more normatively inefficient than a.

As we have previously mentioned, basically any person can occupy a labor position , which means that there is no one behind the admisible hiring decisions, or that there

are not bounded or fixed labor positions. This also means that some of these skilly at searching individuals could hire themselves and others, and we shall not, care aboutor get used to any specific order.

Thus the social patterns for profiling-hiring agents that could praise some at the expense of subjugating others are so far hopefully mainly part of the positive economics which means that its occurrence must keep an evident correlation with formal legal bahavior at the dance floor.

3.1.2 The formation of exclusive groups

This section deals with the individuals' formation of exclusive groups such as elites, which could be formal or informal coalitions of people.

This is, moving away from Sönmez (1997) that bounds the core of a two-sided matching problem to coordination coalitions finding that the set of equilibrium outcomes coincides with variants of these permisible groups, and from Sherstyuk (1999) who would model multisided matching in essential coalitions that must contain at least k different types of members to be able to generate a positive payoff, focusing on the of the members' payoff vectors' construction given transferable utility, still we shall thus instead perform an endogenization to address the mentioned groups of different exclusivity and thus, influence degree as well.

The groups represent individuals making social relations that could yet allow them to influence the matching to get benefits from this. Since the interaction among individuals is not limited and they can look for establishing agreements with other agents freely, we do not recur toa representation of grouping where the persons are a priori subject to social nets.

Our work therefore synthesizes to coalitions' formation in thus one side the social phenomena in question, in contrast with Dimitrov and Lazarova (2008) that would have seen operating firms as the result between matched single sided coalitions, *like* groups of patients with groups of doctors forming hospitals.

In our case, it is difficult to represent or supply to social patterns for grouping and for thefirms evaluating of job prospects, because they are the result of independent decisions which are taken considering the behavior of the other agents in the economy[16].

Although the specific way in which the groups are formed in the different regions is unknown to us, we will follow an axiomatic approach to represent endogenize these social patterns considering different aspects which can be important for grouping. After each axiom is introduced, we provide a brief justification or intuition for its consideration or obedience in the representation's say.

The choice set is the following: Each individual i is endowed with an initial wealth w_i which is the ith entry of the vector of wealth $W \in \mathbb{R}^n_+$. We accept that each agent can observe the productivities and sense initial wealth of all the individuals in the economy to form groups . Thus from some perceived present value of future flows they get the idea about the wealth (capital) that

$$\sum_{i=1}^{n} w_{ij} \gtrapprox \sum_{i \in N} (l_i + 1)\, w_i$$

where l_i is the input-output coefficient.

Before getting a job, each agents j can certainly form exclusive groups freely. In order to represent the mentioned impact of possible influential groups such as elites, we will deal with coalitions which are formed based on expectations for getting job positions

[16] We represent how these social patterns so as the ones for hiring play an evident role also in centralized economies ran by social planners.

with higher wages i.e. of safer scenarios, which does not necessarily mean that personal relations such as friendships between the members of such coalitions are not present or formed. Therefore, this shall distinguish these say quasi-hedonic coalitions from the ones with purely hedonic and non-hedonic settings[17].

Under these "Aires", the population can value the membership to a group depending on its members' wealth, productivity, or both. Such value is based on the expectative about a group's possible influence or power concerning the hiring decisions of the firms.

Definition 4 *The power set of the population is denoted by*

$$2^N = \{\phi, \{1\}, \{2\}, ..., \{1,2\}, ..., N\}$$

This set contains all the possible coalitions which could be formed including the empty coalition ϕ, and has cardinality $\left|2^N\right| = 2^n$.

In the same way, as we start, the i-relevant set that can capture its poolability[18] is denoted by $2^{N\setminus\{i\}}$, which is the power set of the population without him. The grouping agents are risk neutral i.e. topologically

$$pr(l_{i\in s} = l_{ij}) \geq 1 \qquad \text{(RN)}$$

From this probability the previous on the endowments condition is pretty much determined. The groups' formation is the result of a deviced game where the agents maximize their utility. This game is cooperative only in the sense that groups could be formed, but it does not tend to the great coalition N, and as we have previously mentioned, these agents' association decisions are taken individually thus obeying some kind of just individual rationality.

[17] e.g. Banerjee et al. (2001), Bogomolnaia (2002) and Barberá and Gerber (2007).
[18] Including the empty coalition ϕ.

We accept that the individuals do not incur in any kind of payment while looking for belonging to a group. Furthermore, the agents can only belong to one group, and all value and can look for forming exclusive groups equally as it follows.

Definition 5 *The value of a coalition $S \in 2^N$ is given by a function $f : 2^N \times \mathbb{R}^n_+ \times \mathbb{R}^n_{++} \to \mathbb{R}_+$ which is non decreasing respect to the wealth $w_i \in \mathbb{R}_+$, or/and to the productivity $p_i \in \mathbb{R}_{++}$ on any member of a coalition $i \in S$, in the sense that we could replace any individual with a more productive or a wealthier one, and this value would not be diminished because of the increased aspect*[19]*. Moreover, it satisfies the axioms of "Weak Exclusivity", "Minimum Size Validity", "Maximum Size Validity", "Outstanding Recognition", and "Desirability".*

As we can see, the output of this function can be given by the cardinality of a coalition, its members' observed wealth and/or their productivity, which is why it should take elements from $\mathbb{R}^n_{++}$ and $\mathbb{R}^n_+$.

Indvidually of the domain for convenience, we will denote the value of a coalition $S \in 2^N$ by $f(S)$. Not all the coalitions are born, and for simplicity we only conceive the formed clubs just as groups.

Axiom 6 (Weak Exclusivity) *There is at least one coalition $S \in 2^N$ for which $f(S \backslash T) \leq f(S) \geq f(D)$ $\forall D \supset S$ and $\forall T \subseteq S$, where $D \subseteq N$.*

When the inequality in the right side of the condition is strict such that $f(S) > f(S \cup \{i\})$ for any $i \in S$, where $S \subset N$, this represents how the value of a group $S \in 2^N$ would decrease if an outsider i was admitted, and thus, for the sake of *resiliency* this last weak individual is excluded from S posibly ending alone.

[19] A posterior definition will establish more characteristics of this value function.

Axiom 7 (Minimum Size Validity) *The groups have a minimum size of k, such that $f(S) = 0$ $\forall S$ with $|S| < k$ where $n \geq k > 1$.*

This is to represent how a group, would not be expected to be strong enough if it had a low enough size of members, i.e. where k could depend on the sizeof the population, and is an exogenous parameter of the reining value function.

Axiom 8 (Maximum Size Validity) *The groups have a maximum size ϑ, such that $f(S) = 0$ $\forall S$ with $|S| > \vartheta$, where $1 < \vartheta < n$.*

The axiom of maximum size validity represents how groups such as elites do not tend to the great coalition N. This represents how the individuals look for belonging to groups with at most certainquantity of members, where this size could depend on the total population.

As we can see, this sort of local scale effects can fully be credible only if the minimum of k and the maximum ϑ satisfy $\vartheta \geq k$. The weak exclusivity and the maximum size axioms can be understood as a result of how the agents can expect that if their group has too many members, then getting a better wage would become less likely, because many would have the same group value and influence in the hiring decisions, where the excluded persons would not contribute enough to the influence of the group, and being always 'aware' of their exclusion, ϑ will 'normally' be low in comparison to n. Moreover, although these axioms may seem redundant, are 'used' to represent, how can there be formed groups which are more exclusive than others.

Axiom 9 (Outstanding Recognition) *Only $r \geq 0$ groups are formed, where $r << \frac{n}{\vartheta}$.*

This axiom meals that the agents could withoutrisk be excluded from their first choices and yet present belonging to other groups, but only the r stronger groups will have a meaningful expectation[20], while other possible coalitions are expected to have a non meaningful influence.

r is exogenously given as part of the value function. When it is positive r represents, how only a low number of accumulated groups such as elites could influence the hiring decisions, and thus, it always makes sense for it to be much lower than $\frac{n}{\vartheta}$, which in reverse to the argument is just the number of objects that there would be if all the agents joined a coalition with the maximum size share.

Axiom 10 (Desirability) *If $f(S\cup\{i\}) > f(S\cup\{j\})$ for a given coalition $S \in 2^N$, then $f(T \cup \{i\}) > f(T \cup \{j\})$ for* any *other coalition $T \in 2^N$ which satisfies $f(T \cup \{i\}) > 0$.*

Definition 11 *When $f(S \cup \{i\}) > f(S \cup \{j\})$ we say that i is more preferable than j, which we denote by $i \succ j$.*

This particular axiom of desirability means that the agents can be more or less desirable to group with because of the expectations of influence, and that each person is perceived relatively equal to form any coalition. This axiom also means that there is a collectivekind of transitivity in the desirability of the agents where

$$i \succ j \wedge j \succ z \rightarrow i > z$$

Definition 12 *The value function is called materialist if for* any *coalition S with $f(S) > 0$, it is increasing respect to its members wealth in the sense that we could replace* any

[20] The strength of a group depends on certainly different aspects which are further explain later.

agent $i \in S$ with a less wealthy one, and this accounted value would decrease. The function is called talent hunter if for any *coalition S with $f(S) > 0$, it is increasing respect to its members' productivity in the sense that we could replace* any *agent $i \in S$ with a less productive one, and this accounted value would decrease. Certainly, the function is called materialistic and talent hunter if there are agents who are more desirable than others possessing a higher wealth, and there are individuals who are more desirable than others being more productive, even if are less wealthy in the same function. Moreover, when there are coalitions with positive values, then this collective value function is either materialist, talent hunter, or materialistic and talent hunter.*

This therefore means that the collective expectations of influence are based on at least one of these accounted aspects of the groups. Always depending on whether the function is materialist, talent hunter, or both, we will say that there are materialistic and/or talent hunter patterns for grouping.

The *crowd* materialist patterns for grouping say how wealthy agents could gain/have power in the firms throughout investments allowing them to influence the hiring decisions, where this influence would be possible if supported or not invalidated by other influential agents[21]. Moreover, a possible justification for materialist groups also been talent hunter can come from, the *crowd* expectation, about very productive individuals reaching high labor positions, where such agents could either result useful as part *in* the group,or a threat if were *out* of it. This, in others word, mainly distinguishes our desirability from the weak-top coalition property of Banerjee et al. (2001) because we only care for elites, which dilutes into a thus very specific influence mechanism.

[21] The invalidation could come from making the production of a firm more costly or impossible, *like* the rejection of a public permit to produce.

In this direction, in favor this, we accept that if there are at least two coalitions with positive social values, then $f(S) \neq f(D)$ for any pair of them $S \neq D$.

Definition 13 *A coalition $S \in 2^N$ becomes a framed group iff*

$$f(S) > f(D)$$

for each $i \in S$ and any $D \in 2^N \backslash T_i \cup A_i \cup \{S\}$, where $A_i = \big\{B \mid B \in 2^N \wedge f(B \backslash \{i\}) > f(B)\big\}$ and $T_i = \big\{B \mid B \in 2^N \wedge i \notin B\big\}$.

The set A_i contains all the groups which would exclude i if he wanted to join them, and this means that the agents respond to certain group *coercion* dynamic.

Notice that the social values of the formed groups need to be positive, and because of outstanding recognition, only r groups are to be.

As we have previously mentioned the agents, consider joining, 'cause can expect that belonging to a group side will improve their posterior happiness. Marginally-non-ordered implementing, if a person chooses to gather ϕ, and there is at least one coalition with a positive value which would not exclude him, then the other agents who are part of groups could get better job positions thus worsening her wage. Hence, lordly, looking for grouping with the highest possible value is weak dominant strategy because he sees in it a greater or equal chance[22].

In this always solved $n-$personnel-evolution we all might get indeed the 'chance' to *appreciate*, in this way, how thus there may not be a developing of the framed groups about which we can argue (when $\nexists r$), however building upon the previous, as a digressions in the followwing we provide, an society example of the ordered formation of groups.

[22] The existence proof of how every finite game has an equilibrium point can always be seen in Nash (1950).

Example 14 *The set of the population is* $N = \{1, 2, 3, 4\}$. *The poolability of* 1 *is given by*

$$\phi, \{2\}, \{3\}\{4\}, \{2, 3\}, \{2, 4\}, \{3, 4\}, \{2, 4\}, \{2, 3, 4\}$$

The value function is the following: $f(\{1, 2\}) = 1, f(\{1, 3\}) = 2$, $f(\{2, 3\}) = 1.5, f(\{1, 2, 3\}) = .5$, *and the value of all the coalitions containing* 4, *and with a single agent are equal to zero. As we can see the individual* 1 *decides to group with* 3 *and the election is mutual. The agents* 2 *and* 4 *end up excluded from the formed group, and with pride it can always be verified that* $4 \prec 2 \prec 1 < 3$. *The coalition with the greatest cardinality and a positive value contains three agents, and thus, the maximum size validity is* $\vartheta = 3$. *Moreover there are a priori coalitions of two agents with positive values, which tells us that, the minimum size in question is* $k = 2$, *and since for equilibrium, there is only one formed group, the outstanding recognition is* $r = 1$.[23]

Before going any further, a flaw of our grouping approach skill would be given by not allowing clubs equal in value i.e. social stratification. In others words, independently of what the coalitions represent in termsof local or global regional size of population or territory, may not be for many so simplified and thus our approach does not control for geography as econometrically done in Rodrik et al. (2003) or in other words for geometry as done for hedonic coalitions in the example 5 of Bogomolnaia and Jackson (2002).[24]. However, thi grouping "mécanique" follows what analyzed in experimental results that "the dominant strategy is to expend further effort in an acquisition race. Individuals struggle in an acquisition race, much as nation states often appear locked in arms race" (Frank, 2005 as cited in

[23] In this example we are able to identity the maximum and minimum sizes in this way, because of the cardinalities of the total population, and of the coalitions with positive values.

[24] A lying description of this example sounds as further located in this work.

Cullis and Jones, 2008).[25]

3.1.2.1 The selection of workers

The one membership value of the agent i given isin

$$m_i = \begin{cases} f(S) & \text{if } i \in S \wedge S \in G \\ 0 & \text{Otherwise} \end{cases}$$

where G is the set of revealed formed groups which as we have previously mentioned has cardinality $|G| = r$.

Definition 15 *Each agent i, has a vector of d individual characteristics $L_i \in \mathbb{R}^d_+$ which are observed and considered by all the firms to hire him. The first two entries of L_i are the membership value m_i and the labor productivity p_i, and the rest of the entries capture the satisfaction or absence of $d-2$ binary aspects such as sex, race, or specific religions.*

Each binary entry capturing a relevant aspect is therefore equal to one if it is satisfied, or to zero if it is not, and to be a specific agent is not part of these aspects.

Definition 16 *Each unique individual i, she is evaluated by each firm to be considered to occupy job positions according to the function $g : N \times \mathbb{R}^d_+ \to \mathbb{R}$ called "positive labor evaluation", which is increasing respect to p_i, non decreasing respect to m_i, and that could increase, decrease, or remain equal with the satisfaction, of the others $d-2$ binary characteristics of each agent i. Moreover, two agents with the same d characteristics, thus would have the same positive labor evaluation.*

[25] This in turn means that for example, Stockholm dynamic (as the referenced in the second chapter one) guilds, that reach bertrand perfect competition, imply a rather trustworthy stable equilibrium.

The personal suppression of binary aspects to hire could come from beliefs determining the observed productivity or marginal products, or could just from pure discrimination, *like* sex.[26]

The evaluationof the membership value means that when there is an effective influence of the formed groups on the labor selection, then the agents' expectations about which formed groups are more influential than others are right[27], because they have an idea of how the matching is affected. Moreover, imposed an agent could have an always verifiable binary relationship to a member of a group with an effective influence on the hiring decisions, where therefore such threat results in the respective increase of the only positive labor evaluation to be lower or equal than the one given by the membership value.

As is in this way that, given how the firms would normatively elect its workers according to, whatwill be denoted by the positive labor evaluation of the agent i by g_i. As in Balinski and Sönmez (2017), d imposes the evaluation criteria to be such that the positive labor evaluations are never equal (an $n+1$ if you must call her). In reverse that, therefore, reveals that all the individuals can be ranked accordingto their previously induce cuasilexicographic positive labor evaluation.

$g_i > g_j$ spread means that i will fulfill better the requirements for any labor position than j, where for any pair of individuals i and j with productivities $p_i > p_j$, and the same other $d-1$ personal characteristics, the first is satisfied, and this in turn means

[26] Akerlof (2001) who would win the nobel prize for assimetric treatments, noticed that "The black poverty rate of 23.6 percent in 2000 was roughly triple the white rate of 7.7 (Hispanics have a similar but less extreme history of discrimination.). Despite comprising all in about 1/8 of the population, African-Americans have almost 1/4 of all U.S. poverty." Akerlof (p. 386, 2001). That extreme case among others motivates what is in here to develop.

[27] As we have mentioned, the membership value represents an expectation of the influence of a group on the labor selection.

that for equal individuals any productivity difference is thus purely appreciated by the firms .

When the arise of d and thus of a positive labor evaluation is discriminant respect to a binary aspect or has favoritism for it, we will always say that there are discrimination or favoritism patterns for the available hiring respectively.

It is *important* to notice that not to starve, the proper value mechanisms always arise, as for the example of the subsect. 3.1.1, where the marginal labor productivities for such case, are thus essentially different due to the last united one bargaining power caused by the $d = n + 1$ entries.

Independently of the socially normed unions and of the $d - 2$ member satisfactions, we accept that the agents can indeed observe the thus equally adjusted wages of the job positions they occupy when are in principle offered to them. Since the firms maximize benefits or welfare, and thus just look for hiring the agents within the highest possible labor evaluations to fulfill the requirements of their job positions. Moreover, given that each i is programmed as utility maximizer i.e looks for occupying the job position which offers the highest possible wage for him.

An early result to our model is thus that just her took endowments and wages for formation never correspond to the proper observable labor marginal products, unless workers tend to infinity[28]

So spacedly, only for a profitable job position to be taken, the job has to be offered to

[28] This feature is not fully unrealistic specially when consirering how as Tavani and Zamparelli (2016) notice for a modern-traditional sectors economy direction, ther is not a labor supply constraint as the modern sector can always draw workers from the traditional sector, and assymmetrically in a mature industralized economy, inflows of international migrants may help say overcoming any labor shortages. Moreover, this result is consistent with footnote 20 in Akerlof (2001) that "Bewley (2000) concludes that morale is an important reason for failure to make wage cuts. Cambbell and Kamlani (1997) report that morale is a major reason firms do not make money wage cuts, but so is concern over quits by the best workers." p.371

the worker, who must accept it[29]. The agent i occupying the jth place in the descendent ranking of the positive labor evaluations is denoted by r_i^j.

B is the set of all the possible labor assignations which has cardinality $|B| = n\ !$, and it is enough t observe that there is only one labor assignation where the agent r_i^j gets the job position with the jth highest wage, because any change of it would not satisfy such order.

Definition 17 *A claim is a non-side-biased unstable match* (v_e, r_i^k) *i.e. either the labor position* v_e *would* like *an* $r_i^{>k}$ *that occupies a position* v_c *with* $p_e > p_c$*, where* v_c *has the ideal labor productivity which is closer to* p_e *and a worker that* v_e *would rather employ, or the other way around looking at it from the implied productivity optimization of an* r_i^k*. Moreover, the ith entries of present claims in an assignation are never equal with eachother, being accounted starting from* p_1 *to* p_n*.*

This "Aires" mean that the number of claims says how many couples of labor positions and workers are maximally willing to modify a labor assignation by matching.

We optimally denote by $a_u \in B$ a labor assignation with u claims. A function $F : B \to B$ of fair new workers incorporation starting from an arbitrary labor assignation, has the essential fundamental form given by (Eq. 3.3).

$$F(a_u) = \begin{cases} a_{u-1} & \text{if } u \geq 1 \\ a_u & \text{Otherwise} \end{cases} \qquad \text{(Eq. 3.3)}$$

An inner evaluation of thiskind of function implies more than one changes because more than one vacant looks for hiring individuals, and its iterations ensure certain restricted mistakes and thus, learning of the assignation or performed contracts norm.

[29] Central planning making all the agents to receive equal final incomes, i.e. rejecting the proper wages competitivity, would be indifferent between occupying any job position, and thus the labor assignations would just be done by the centralized autority which maximizes utility planning all the firms as one.

Theorem 18 *Each individual r_i^j is hired to occupy the labor position v_j.* .

Proof. If the set of assignations with u shaped claims is B_u, where thus a function with the form (Eq. 3.3) is such that $F : B_u \to B_{u-1}$ if $u \geq 1$, or $F : B_0 \to B_0$ otherwise,

given the only one negotiable labor assignation without claims, where each agent r_i^j occupies the labor position v_j, and therefore the fixed point, and being said that, provided that the non-hipothetical maximum number of claims in a labor assignation is $n-$, thus the number of iterations of F to get to the fixed point starting from an arbitrary labor assignation is finite.

Finally, our naturally taking place disclaimer implies that the fixed point exists. ■

This theorem applicable to unbounded deviations from the fully rational fixed point is an application of a fixed point theorem that captures-states the enveloped evident absence of trade-off between marriages stability and happines i.e. wages. In particular the Appendix E.2 is interested in providing a less abstract and perhaps more symple or bountiful version of this theorem with its proof[30], and independently of the mechanism, any fair global fixed point theorem is applicable to this formulation[31]

In contrast with Lain (2016) conception, our static approach implies that happily from normative-productivity the, loss i.e. $\sum_{i,j \in N} \max\{\max\{p_i, p_j\} - \min\{p_i, p_j\}, 0\}$, should show an evident correlation with the u shaped claims, this, due to the provision division by 2 of the agents, and for an assignation, passingthrough the worst productivity case, fully with productivity priority normatively speaking in reverse, in others word, contrary to Lain (2016) therefore the two-sided non-sided-biased-distorting matching agresively implies the free accounting possibility of an asymmetric opportu-

[30] Therefore shorter.

[31] In order to apply a general version of the fixed point theorem to the present specific coalitional context, it should be remembered that the number of claims in a labor assignation is in a metric space.

nity for any discriminatedor out of a group individual, to become entrepreneur and generate her normatively efficient job position[32], while a biased one would include only a bounded accounting possibility, and in any time layer case this does not mean that the stable agents do not enjoy a financially stable, right. Moreover, whether just the individual conduct behind a pattern can be relatively classified as a restricted or unrestricted personal pleasure, *like* fairly performing an optimizer and thus towards welfare conduct, or not, is still studied or captured in detail in Pinderhughes (1971) for the overqualified hungry-thinker introjection.

3.1.3 Stressing sided profiles specialization

Schüssler and Seidel (2010) highlight how differently chosen distance measures between required and attributed traits' profiles are important to give microeconomic foundations to a productive labor matching, where the minimum measure between jobs and employees across characteristics were justified as sensitive and used to derive the preferences for a Gale-Shapley, while we instead have preferred to jump into a certain and thus directly cardinal specification of productivity. Therefore we even believe appropriate to look for, developing, the present nonelexicographic unique binary profiles extension that recognizes how preferred grouped requisites or capabilities would more *like*ly ensure the fair, understanding or application or productivity of our model.

A part from the requirements which are contained in P, we can consider how the individuals are specialized in specific tasks such that not just any worker is able to occupy any labor position. We represent this by partitioning the set of profiles and the

[32]Such *status quo* in question can come aligned with "In group"-"Out group" parochialism of the Schwartz-Shea and Simmons (1991 as cited in Kemp, 2003) fashion, as it comes for working-not-working agents.

set of individuals, accordingto the profile specializations.

For q labor specializations we claim the set of partitions to be $PV = \{V_1, V_2, \ldots, V_q\}$, where each sub set V_i needs the ith trait (Thus aborting sex-selectively specializations). The other side set is as well claimed to be $PN = \{N_1, N_2, \ldots, N_q\}$, where each sub set N_i thus evidently related to the ith specialization, is disjoint and non empty.

Let us issue the condition that for any $i \in N$ who has the zth specialization, the ideal partner profile $v_i \in V$ is in the partition V_z. This in comparison to the previous subsect. that imp.lies that i can always instantly 'specialize' in any practice, in principle builds upon how though academically the rule would be not to allow i elsewhere but to occupy some $v_j \in V_z$, if one is to app.lie the previous theorem, it fully means that thus specialized profiles can 'switch' locations.

3.2 Results in the total production caused by the hiring patterns

According to the groups' formation sect., more partitions of specialization would thus result in a lower 'practice' of inneficient social patterns. In reverse that, considering the developed grouping skills and *unloved* discrimination activism among many agents, the free hiring decisions can be affected by the social patterns. Further, the undepreciable happiness happens to affect the stable marriages and thus the stability of the firms and of the economy as a whole, and from this, a bad marriage i.e. due to wages a missmatch, *angrily* can result in a macroeconomic sharp down, but not the other way around which is why in the following subsections mainly as a mechanism we will not consider partner specializations fairly governing or simplifying our from that behavioral free inner results

3.2.1 Results in the total production concerning the influence of groups pattern

Let us think that as a mechanism, provided the disclaimer, the positive labor evaluation does not show any discrimination or favoritism patterns for now.

The presence of influential groups with materialistic patterns thus therefore ensure a better marriage to its members in comparison to the clear-established normative assignation $\bar{Y}$ i.e. causing a fair normative inefficiency.

Inspite this, a research scenario example where the outcome is $\bar{Y}$, or in others word, the inefficiency free one, is given by the freedom from wealth inequality. However due to the color of productivity, being individually or collectively ordered or not, the ruling patterns for grouping and of the positive labor evaluation matter, and thus wealth inequality is not necessarily a cause of free from normative efficiency in the total one bargained production This is, the promotion of wealthy elites skills developments can become weak enough causing a higher agents' productivity, and in reverse, neither purely wealth inequality nor the grouping patterns are a cause of corresponding deviations from the clear-established $\bar{Y}'$. Moreover, away from a thus senseless correlation coefficient, if on p's there are talent hunter without materialistic patterns for grouping, the finaloutput is just the real imPact $\bar{Y}$ one, specially if there are groups which are strongly influential on the positive labor evaluation, and finally, it could be that geographically empathic $f(S) = 0 \; \forall S \in 2^N$, which coming from far behind would out loud specializedly thus result in The known normative assignation as well.

3.2.2 Results in the total production concerning the full impact of all the hiring patterns

As it should be evident by now, how a departing from the normative assignation experience, considers a ranked first best switch with an *ith* best one where $i > 2$. This would essentially imply two claims where the second best will always prefer to match the first best, while the first best will always prefer to match the second best. And The same can be said about any neighbors' pair, for example between the second and the thirteenth.

So occupying a preventive amendment position, fairly asking our construction about whether different in the reserve army mechanic patterns could reduce or eliminate the effect of another social norm on the positive labor evaluation, means, in principle the Yuxtaposition of influential talent hunter groups with any other discrimination or favoritism patterns, originates a willing algorithmic result. Excluding a member from kind ofmaterialist influential clubs has an evident effect on the production, where her destiny would be evident as well, which just means that when in turn finding a very wealthy or productive agent out of an influential club, the damaging grouping patterns are thus rationally dismissed, which thus applies to the hiring patterns as well.

It works well to see as a winner lottery ticket, independently of how 'friends' or group members in one side, together with other patterns affect the marriages stabilities of even self employed, and thus cowedly conected, with given the implied nash equilibria of the groups subsecT., macroeconomically achieving a specific case, with many directional patterns for hiring agents perfectly compensating its influences on the positive labor evaluation.

The definition of the positive labor evaluation can allows us to realize the utility impact that an insurance to cover matching accidents would have, where an optimum of Pareto would be desirably related to social *movility*.

A case where the characteristics of the individuals are correlated with their labor productivity, such that A positive labor evaluation with strong favoritism, or/and discrimination, or/and the influence of wealthy groups patterns are normatively justified, is not theoretically impossible, however determinatedly inspite the critical aspects in question that could be identified due to a simple statistic test, where fairly provided how pushing this certainty, this claim is not *like*ly for many unknown factors in the sense that the social dynamic has not yet being specified lying nothing but a powerful incomplete statement. Therefore, we highlight how the positive labor evaluations reveal social patterns affecting beyond any empathy resulting from games permutation to check for symmetry of the Nash (1950) fashion, in the direction that engaging in keeping an economy from producing the normatively efficient outcome reverses to a certain particular standing point in termsof the right, *surprising* cost of The patterns.

And the following section provides justifications and representations which in these "Aires" address how these macroeconomic behaviors affect the productivity in other ways, and how meaningful behavioral macroeconomics could fairly evolve over time for the hungry-thinker profile.

3.3 The life style of the individuals, changes of the social patterns in time and the productivity

There are many social aspects of the current world which are commonly accepted as being part of a standard, and that were not practiced, being considered far from reality

or even utopian in past times. Looking at history takes us to think that some social patterns which concern the quality of the life style of the individuals could evolve. This is, there may be a venereal disease effect that dominates matching promiscuity benefits to evolution.

In the previous a higher respect of the equal right to work which is implied in diminishing the discrimination on the hiring decisions is fairly related to the productivity of a region, where both, form a commitment that follows the logically expected correlation between louder and better sound of development rhythms for the particular life style of the population[33]. The respect of this particular human right is also related to a general intolerance to a kind ofinfluential actions with an evident symbiosis with support of practiced laws, where the higher wages expectations from forming such kind ofgroups ould also be diminished.

It takes time for initiatives, and for laws which look for improving the life style of the individuals to reach its evident destiny, where the time thus becomes the critical point in question. Secondly, when common practices are relatively notable acts against the human rights, such of high gravity initial conditions may be recognized by outsiders who ask them selves: Why not to do a quick and effective policy to stop such unpunctual practice? Although there might be planed actions which can impact generalized patterns of behavior, if the result is expected to come from the free decisions of the individuals the critical point charges complexity.

Under this spirit, remarking the productive importance of free will, free expression and other human rights which are Pareto accepted as game symmetric-essential, take us to wonder about which actions or policies could be effective in improving, these aspects

[33]To learn more about the human rights, see United Nations (2015).

of the daily living of the individuals. A broadly accepted example of this lies in the mechanisms design framework, where if say there is a new deadly contagious disease spread that could infect anyone, with some low rate of mortality, after observing a prominent increase of the demand for life insurance products, one is to grasp general lessons such as: a certain effect can be derived from randomizations if and only if such are provided with certainty. This *unlike* other "Aires" takes us to find evident limitations in terms of the conduct respect to norm improvements and thus of impact as well. Moreover, in this direction the role of violence becomes as desirable as its evident direction in the practice of the human rights, which a part from its obvious threat to the living of the

people, would also ensure a presential non-rival force on the productivity of a region[34]. The only way to fairly impact might lie in the following.

3.3.1 The impact of the media on the welfare of the population

In the daily life, the population is exposed to open access information where the normality of social patterns such as the practice of human rights, is shown as a natural behavior, which can influence the crowd in-out of actions of the individuals. Moreover, the opinion of public or famous figures about problematic issues can influencethe popular thinking , or awake debates which can result fruitful for the life style of the population.

Amartya Sen[35] in an interview for the national T.V. of Nicaragua, mentions that there are many ways in which the public discussion is effective when it comes to traducing a problem on its recognition and remedy, because the individuals learn from each other (Confidencial, 2013).

Dubner and Levine (2005), describe how the introduction of the cable T.V. public utility can be associated to a decrease of the violence against women in India. Moreover, Dubner and Levine (2009) mention how when the adventures of *Superman*© "clan of the fiery cross" where the hero fought a racist group stopping violence against an immigrant family, started spreading keywords used by the Ku Klux Klan, inclusive adjustments took place, that the recruitment and the activities of the organization started diminishing.

Thanos is a villain who attempts to decimate half of the population of the universe for the sake of stability claiming himself to be inevitable. Although he doesn't see this as

[34] Mainly as a whole, The violence and insecurity are well known for causing expectations for reducing the incentives for investments. e.g. Barro and Sala-i-Martin (2004) estimate a positive effect of a subjective indicator of the respect of the law on economic growth.

[35] Amartya Sen is an economist and a philosopher who has been awarded with the Nobel Prize in economics for his contributions in the field of social choice and welfare.

an evil, a group of super heroes called the Avengers (The group is chiefly composed by Iron Man the technology edge builder leader, Capitain Marvel a super powerful female being, Capitan America the unique remote result of a scientific military experiment to build supersoldiers, The Hulk a scientist that losses control and turns into a super strong animal that knows no limits, among others) face him, and through Iron Man's help that in some way managed to manage the quantic chaos to perform a time travel, they attempt to reverse the so long damage done by Thanos to the population of the univers. This all takes place at the Avengers End Game film which continues the plot posed by the Infinity War previous film.[36]

For this correlated and to study in more detail, free content on the one impact that the media can have on economic growth depending on the plural present circumstances *like* ownership or regulation targets , see World Bank (2002).

3.3.2 Productivity and Governmental Candidate Structures

"Aristotle saw the market as a "creature of the state" (Lowry, 1987, p.237)." Medema (2003, p. 429)

"It was not government that Adam Smith was opposed to; rather, he was after the appropriate set of policies to facilitate the growth of wealth." Medema (p. 434, 2003)

The way in which a governmental organism is selected or formed is relatedto social patterns, where there could be individuals who are to participate in governmental decisions, to vote in public elections, or to occupy governmental positions.

In the following we introduce a formal representation of how differential structures of organizations to perform a task can have a different productivity, with an interpretation

[36] see Feige, Russo and Russo (2019).

concerning governmental organisms. This representation is a cardinalities mechanism an thus there are not differences of objectives between structures, where some structures could perform better in achieving a given goal[37].

We represent how the coordination among agents becomes more difficult when there are many in one organization, because in order to perform a task which involves many people, persons tocoordinate the individual actions become necessary. We can see formation models responsible of this for many firms, the army, Non-Governmental Organizations (NGOs), religious and political organizations etc. (see Hart et al. 2008)

The set of persons who are organized is $N = \{1, 2, \ldots, n\}$. We denote a structure by $(N : S_m : S_{m-1} : \ldots : S_1)$, where each S_i is a set which contains the individuals in the ith level of coordination or training. The labor supply is elastic[38] so the levels are such that $S_i \cap S_j = \phi$ for any pair $i \neq j$.

This number of levels can vary depending on the task of the organization and on the number of organized individuals, and we take it as exogenously given assuming that $m \geq 1$ such that $S_i \neq \phi$ for any i. The first level $S_1 \in 2^N$ contains the individuals who take decisions concerning the coordination or training of the activities of *per*sons who do not coordinate anyone. The second level $S_2 \in 2^N$, if any, rules the activities of the individuals in S_1 and their domains, and this interpretation goes on such that a last level of coordination or training $S_m \in 2^N$, contains the individual(s) taking the most general decisions of the complete organization.

[37] Differences of productivity among structures are fairly given by managerial differences, and this in turn means that such differences could lie on the way resources are utilized.

[38] Basides Classicals and Marx", the cannon fodder of the natural "assumption of a labor supply that is infinitely elastic at the going wage share for a reasonably long period of time has been fruitfully utilized utilized...at least since the analysis of a dual economy by Arthur Lewis (1954)," Tavani and Zamparelli (2016) In a dual economy, after the traditional sector can no longer serve as a cheap labor source, the labor constraint on the economy starts to bite and symmetrically the assumption of constant wage share must be dropped.

Although there could be differential restrictions for this trainning ring, only attention shall be paid to the cardinality of the levels, and to the individuals occupying them, so the essential restriction is imposed(Ineq. 3.6.1).

$$\left| N \backslash \bigcup_{i=1}^{m} S_i \right| > |S_1| > |S_2| > \ldots :> |S_m| \qquad \text{(Ineq. 3.6.1)}$$

In this direction, the set of possible structures G is therefore the following

$$G = \left\{ (N : S_1 : S_2 : \ldots : S_m) \;\middle|\; \begin{array}{c} S_i \neq \phi \text{ for any } i,\ S_i \cap S_j = \phi \text{ for any pair } i \neq j \\ \text{and } |N \backslash \bigcup_{i=1}^{m} S_i| > |S_1| > |S_2| > \ldots > |S_m| \end{array} \right\}$$

We as well accept that $G \neq \phi$, basically for given N and m.

There are different options of structures which can be formed, because different individuals can occupy positions in the ruogh levels of training or coordination.[39] Moreover, as an entry simplification, attention will not be paid to the different positions within a common level and therefore , utilizing fixed cardinalities of trainning fully implies to be as many as

$$\frac{|N|!}{\beta_0 \, |N \backslash \bigcup_{i=1}^{m} S_i|! \prod_{i=1}^{m} |S_i|!}$$

options of structures. In principles, it is up to u_i indicating the confronted number of possible structures for the fixed cardinalities sub indexed by i. Therefore, denoting by s the number that is made in honor to all different options of levels' cardinalities which satisfy the social restriction (Ineq. 3.6.1) , we get that the so relevant size of G, or cardinality givenby

$$|G| = \sum_{i=1}^{s} u_i$$

[39] "Modigliani's (1944) influential keynesian model offered a highly simplified aggregate-supply curve: perfectly elastic at the current price level up to full employment and inelastic at the full employment – a reverse L-shaped curve in price/output space. These models simplified Keynes's account in an effort to render it into a closed set of algebraic equations"..."Alan Coddington (1983) stigmatized them – with some justice – as "hydraulic Keynesianism"." Hoover [2003, p. 412)

Can we afford to start identifying and counting the possible options of cardinalities from right to left. Let us start setting aside the threats to the minimum cardinality of the highest level of training . This smell reaction is, when $_m > 1$, starting by fixing $|S_m| = i = 1$, and by fixing $|S_1|$ on its highest possible cardinality which satisfies the social restriction taste (Ineq. 3.6.1).[40] Then identify and count all the possible cardinalities of the rest of the sets *which* purely satisfy the essential restriction (Ineq. 3.6.1) for the two fixed cardinalities[41]. We side decrease one by one the fixed $|S_1|$ and apply the previous steps for each decrease until there are no more cardinalities satisfying the operational (Ineq. 3.6.1) and $i = 1$.[42] Posteriorly, we centrally repeat the previous steps increasing i one by one over and over until there is not a higher i satisfying the (Ineq. 3.6.1). The sober exact answer which is a purely mathematic one, we leave as something to achieve for the incomming reader.

As we have previously mentioned, these organizations are formed with a specific task *or* objective. A function $f :^G \rightarrow \mathbb{R}_+$ represents the yields of a structure in the productivity sense. This means that *unlike* Bogomolnaia and Jackson (2002) our function is not necessary anonymous in the ring sense that an arrangement of cardinalities $i, j \in G$ that satisfy $S_{l,i} = S_{l,j} \forall i \neq j \nLeftrightarrow f(i) = f(j)$. Independently of one or none, the ongoing certain behavior within this work, will be to recognize each possible structure i by $(N : S_1 : S_2 : \ldots : S_m)_i \in G$

Definition 19 *An in this direction of functional notation structure* $(N : S_1^* : S_2^* : \ldots :$

[40] We refer only to this restriction say for simplicity, thus taking for granted the sadisfaction of the other texture conditions .

[41] There could be only two levels of coordination $m = 2$, and in such case only these cardinalities would be identified and counted.

[42] Notice that there could be only one possible cardinality $|S_1|$.

S_m^*), *which satisfies*

$$f\left((N : S_1^* : S_2^* : \ldots : S_m^*)\right) \geq f\left((N : S_1 : S_2 : \ldots : S_m)_i\right)$$

going to for any *i is called maximal killer structure.*

Notice that there can be more than one maximal killer(s). It is important to be aware of a maximal killer structure(s) because bring the highest benefits for the surroundings[43] or achieve better the objective of the organization,[44] which is an obvious weapon for drawing implications in terms of the ideological relationship between its methodology and resources assignations .

3.3.2.1 A Good Definition of Authority

We can make an application to the selection of organizations spirit where N is the total population, and the provided coordination levels are called say $dACC$, PFC, $vlPFC$, $dlPFC$. There is a set given by $Y \in 2^G$ of candidate governmental structures which haven't been selected yet! We denote by $(N : dACC^* : PFC^* : vlPFC^* : dlPFC^*)_c \in Y$ the recognized structure(s) with higher yields among the candidate structures which we shall call maximal candidate structure(s). Moreover, since $|Y| \leq |G|$, the largest candidate structure satisfy the following

$$f\left((N : dACC^* : PFC^* : vlPFC^* : dlPFC^*)\right) \geq f\left((N : dACC^* : PFC^* : vlPFC^* : dlPFC^*)_c\right)$$

This means that a higher participation of the population thus makes the $|Y|$ recognized candidate structures to be more productive, resulting that in say, the anterior *insula* of selection displacement, for one perspective in common[45].

[43] Physiocrats are the fathers of the impact studies, with agricultural surplus as the to be observed main index (see Madema, p. 432, 2003).

[44] The therefore free of obstacles **or** full known potential.

[45] We will come back to this point further ahead, where it sounds as better located.

In the meaningful specialized case that the governmental organization is selected throughout voting, this just means that independently of the cardinalities, if more individuals prefer. The slots are ideally occupied by the killer(s) arrangements. This is, still we highlight the importance of the practice, and admiration of equal rights for the individuals to pursue participation arrangements as candidates, and to inprinciples be selected to occupy governmental positions in democratic and *centrally* planned states, as a key ingredient in theevidently wanted achievement of higher or more free of obstacles governmental productivities.

Particularly, away from this qualified construction in turn looking away at our growth model, we can also appreciate some settlements of "la llorona" effect[46], by how the positive hiring patterns which took place in the representation of the subsection 3.3, mean that firms and learner firms misses structures which can be more productive by not allowing certain job candidates to occupy some utterly disparate positions, in thus consciently managed regions.

3.3.3 Social patterns over time: An application of a fixed point theorem to identify the necessary conditions for a kind of technological change

An increase of the access to education or/and in the participation over the decisions concerning the welfare of a local community or/and in the access to health services, being caused by a change in a social pattern, is related to the productivity of a region. Improvements of these kind can be observed to even work in synergy to cause a magnitude change on them selves , thus reflecting notorious positive impacts on the daily life

[46] This is further explained after the 21 Theorem.

style of the individuals[47]. Further, notice that in the representation of the first sect. at the second chapter, this means quite prominently that there could be social patterns making the public provisions to be just below the optimal[48], where, if these provisions resulted, higher or equal than the optimum of Pareto, this could imply discrimination patterns, an employable population lower than N or L for the first sect., that the government has redistributive priorities as well[49], and where could such exclusion be claimed legal or not, independently of incurring on a fixed costs or taxes possibility[50].

On this side we might say, by looking at historical contexts and its changes over time,[51] these ones appears to in principles indicate that there is a kind of social learning in improving the mentioned aspects of the life style of the population at least for many regions, such that there are fair improvements which do not show a single causality, but instead it could be said that they look *like* the mentioned synergies at work. This always communicated change in patterns can show different times in different regions. Moreover, the historical paths[52] that engine these changes have not been necessary the same, and sometimes were not even remotely similar layers.

The social learning that we speak about, does not imply that tendencies against recognized human rights are erased or that events against these social values stop oc-

[47] For example, agents which present a discriminated characteristic and occupy a public position make their presence in such jobs to affect the naturality by being observed, and this also contributes to accept their equality with other individuals to access health and education .

[48] Distorting the governmental vision of the average agent, where the optimal provisions thus do not differentiate the individuals to consider them as receptors, or are anonymous, and for a further critique to targeting see (Sen 2014, pp 191-195).

[49] The social patterns also affect the access to the other public services which are considered in the first two chapters, and this as well would basically be reflected on the labor productivities.

[50] For example, the $d-1$ exclusions of the first sect. Evenmore, diverse postures respect to the limit location such as the P "accumulation" (see Appendix B), is related with findings in Cullis and Jones (2008) that "homorealitus" reveals concern for others, whereas "homoeconomicus" optimal governmental size looks leviathan like, so our optimal size does not obey either one or the other.

[51] The merit of recent developments on this respective framework should go to approaches such as the one of Thomas Piketty (2013).

[52] Regimes , religions , the way of change ,...

curring, but instead this means that past situations which present certain tendencies are less observed on average over time, thus, becoming less *like*ly to be tolerated by the population in general. Furthermore, the time differences between distinct regional improvements of this kind can cause an abysmal difference in terms of the respect of the implied human rights, and for that case a low enough speed could look *like* the prevalence of social patterns.

As we have first done it, a "minor" voting or participation is relatedto the productivity of a region implying certain gravity, however, where are the generals changes for governmental organisms pointing at? Given the Kaldorian commandments for relatively modelling economic growth, consider that, by fairly looking at the history, the took governmental goals have been changing for many regions, and the arise of institutions which promote and/or incentive the research and development and the formation of scientific knowledge to implement leading technologies, that look for establishing competency among the firms[53], and that characterize an increasing tendency on its well applied agenda. This is, exclusively these Schumpeter-inspired public actions imply the usual euthanasia, for previous gobernmental postures, which pushes down to claiming how these have been becoming common goals in the selected governments as a kind of tendency toward what the Social Choice discipline would call a "Pareto unanimity" in this respect[54], maybe due to the evident relationship between the personal and collective

[53] The development of new technologies is a sort of competition, which is related with property rights. A prominent example is The secret that the general models present in the first chapter, which is assuming perfect competition. However the government could concentrate the always establishable competency of the basic services firms, for which would therefore affect the implied deprivations. Moreover, this point also applies to the producers of all the provided in the second chapter. .

[54] This among other concepts of Social Choice are explained in Plata Pérez (1999). Further, referenda systems of direct democracy seem to cause empathy: "The actual choices made depend on a large number of variables many of which have been experimentally studied, but a consistent finding is that people do invest in the public good" (Ledyard, 1995 as cited in Kemp, 2003, p. 271), although my personal experience is that recent attempts to implement such mechanism in México seem to face heavy critiques, at least from the in praxis "well educated" economists' status quo and their devoted followers.

gains in this respect i.e. the 'participative' public-private symbiosis always determines sectorial corruption tendencies, and reversing that, notice that prominent productivity improvements that we concentrate are not the ones given by the certain natural survival R&D incentives partiality, but the ones given by the arise or access spirit of these sort of social planning composition policies, where as a different flavor there could be a displacement of (or a crowd out effect on) obstructions of these kind of formal objectives by the government caused by social patterns[55]. *unlike* what remains as the Afonso et al. (2014) posture, it does not matter, how essential research and creativity result in principle, is that due to its natural resiliency claimed effects, that endogenous growth is not compatible with an economy intensive in such elements. What is just still fairly present yet in what Lucas (1988) right foundations had settled. Moreover, in comparison Irmen and Kuehnel (2009) say that only if research focuses more on idea-based endogenous growth models (controlling for new ideas), the robustness of policy recommendations can be checked. In reverse, as they put it, including hitherto unexplored types of government expenditures, e.g. on the rule of law or commandments, would thus become desirable!

[55]In the second chapter we have as well mentioned how the heterogeneity on the composition the sets of public services could lie in voting manipulation studies by Salvador Barbera (See Jackson and Sonnenschein, 2011). Evenmore, the social preferences crowd out and crowd in of social preferences effect of incentives when these are present is exposed for Bowles and Polanía-Reyes (2011).

And removal of the previous misses how:

Leadership becomes necessary that human capital gets crowded-out to a second plane at the growth mill of "Aires". We are fairly to consider how many regions have been experiencing managerial improvements, by say, the of public sector over time, increase in referenda to the speed and effectiveness smell specializedly of thus bureaucratic paperwork[56].

3.3.3.1 Addressing the "Mécanique"

In the year 2020 the spread of Coronavirus (COVID-19) would kill thousands around the globe. In the very fist stages, policies to stop the appreciablecrisis were released. However, provided the social conduct of contagion (it was enough to touch or be close enough to someone to get the potentially mortal disease, whose spread showed exponential contagion patterns), most of the countries' strategies showed to fail, deriving this in the spread around the world, for many families would use the quarantine days as holidays.[57] This example evidenced the poverty of game theoretic approaches, and strategy proof mechanisms design; the at the time ruling polity schools upon which most policy recommendations were drawn. With that objective in mind, the absence of societies "mécaniques" understanding outstands, were numenors "mécaniques"-fixings

[56] Approaching the limit location is a terror area, for we need to (x)classify whether the high positions belong to one group or the other and thus $(xx)$the usually dismissed principles and normatives. Away from this, in the same way that "homoeconomicus" and "homorealitus" can be maped to their corresponding location, the limit lies between them and corresponds to a class that conceives such classes named "feminamlimitus", leaving each of the former classes in their evident respective side, of the left and the other. In turn this class can as well be conceived as "homolimitus", but in any case just getting to the limit is to become of maximum importance to our serious construction. This makes that training of Bowles and Polanía-Reyes (2011), basically essential in figuring out for example say second best incentives reactions (A part from social preferences issue, they as well address own-material payoffs behavior and its possible salience due to incentives), inspite how as we regreted, the fact is that these two parts of a same location spirit are just separated by an in the middle of the road provided limit.

[57] In more advanced stages one personal perception is that even the people that hadn't lost someone stopped believing in the virus, whereas some loosing close ones took it as an imputing fake causes of dicease governmental conspiracy, at least in countries like Mexico.

could have taken place in earlier stages, independently of their spirit (for example, Ellinor Ostrom-Leviathan *like* ranging fashions of social traffic managements (thus bottom-top)), thus saving thousands of lives (Ensuring the health security entitlement).

To conceive representing these patterns changes, we consider how, these improvements take place over time, and how these changes necessary show a time pattern. This consideration is done, because these social improvements depend directly on the complex evolving of the individuals' actions, keeping within mind as we have previously mentioned, the public role of policies, education, the media, and other factors, away from the well known schumpeterian dilemma but as well addressed by her spirit of institutional evolutionary biodiversity approach[58], that influence such daily decisions with time.

"Mécaniques" can as well be found *like* for tax paying as Braithwaite and Wenzel (2008) when they write; "Social identities assume prominence through identification with groups. If the identification is weak, the *like*lyhood of the individual assuming the tax paying identity of that group will be relatively small. Identities change as individuals move into and out of groups with different tax paying cultures..." p. 321, a powerful description that matches better hedonic coalitions formation rather than rival individual psychological branches. Eventhough they later conclude contradicting their insights saying 'sustainable progress is made, not through appeals to self-interest or slick marketing or blind rule following, but rather through deliberation as consumer-citizens

According to our "mécanique" incentives can be present in an effective manner, for such incentives are just an interaction, and interactions without authority levels present positive effects (are fertile) i.e. do not show kick back. Evidence on this can

[58] see Pagano (2007).

be traced back to Bowles and Polanía-Reyes (2011) verifying that "A large number of experiments have found positive effects of incentives imposed by decision of the target of the incentives rather than by the experimenter or by a principal (Cardenas (2005)), Tyran and Feld (2006), Kroll, Cherry, and Shogren (2007), Ertan, Page and Putterman (2009), Kosfeld, Okoda, and Riedl (2009), Mellizo Carpenter, and Mattews (2011), Sutter, Haigner, and Kocher (2011)." p. 38

Let us go on by considering a happines reallocation that fixes previously getting away from the limit "mécaniques", to interlock them in a toward the limit direction, were as it is justified we build preferences, based on transferable utility as done for cooperative and coalitional games. Such implied authority as usual satisfies its avoiding remorse implied definition. Moreover, to keep within mind, "mécaniques"-Fixing are to just end asymmetric treatments fixations, and are thus just as well "Mécaniques".[59]

Certainly, as well entirely departing from a Case and Fair, 1997 study of macroeconomics, eventhough many would attribute to social preferences and institutions the contention of the following Bowles and Polanía (2011) quote: "when those who have contributed more than others are punished (as some times occurs, Herrmann, Thoni and Gachter (2008a)), they subsequently contribute less and costly retaliatory punishment timessome results (Bowles and Gintis (2006)), Carpenter, Bowles, Gintis, et al. (2009), Hapfensitz and Reuben (2009)). This appears to occur because the targets of the punishment feel hostility rather than shame." p. 29

Being recorded for YouTube by researchers from Vienna, wolves and dogs simply refused to cooperate as a reaction to unfair conditions of asymmetric treatment which

[59]It must seem all wrong and yet alright that, basically we did not yet have specified how such "mécaniques" fixing would cause a justification on which in turn is to impact preferences learning, although such later effect is rather irrelevant to our main concern. For which we abort such respective 'scientific' spirit development.

was concluded not to be a *like*ly effect of domestication (see Essler and Marshall-Pescini and Range (2017)). This fact indicates rather a basic instincts spirit which is better revealed at our "Mécaniques", uncovering the entire contention of the previous quote to our Behavioral Macroeconomics branch.

Let us focus how for example as Shinada and Yamagishi (2007, as cited in Polanía and Bowles, 2011) that "Hokkaido University subjects who cooperated more in a public goods experiments when assured that other who did not cooperate would be punished." where it is later added that "The respondents may have exhibited what Iris Bohnet and her co authors call "betrayal aversion"" which by looking at the other way gets to its closure by clarifying how such aversion was "attenuated by knowing that betrayal would be punished by a third party (Bohnet, Greig, Herrman, et al. (2008))"

(x)"Mécaniques"-Fixing can as well concern the employment of *social networks* as a destiny catalyst, (xx)to what constitutes Marxist mechanisms such as the mentioned in Pietrykowski (2003) that "class power as a dominant economic ordering mechanism; and profits as determined by technical change, class struggle," p. 482, so in the same fashion that they are employed to achieving the (xxx)general equilibrium, for example, ()x If considering education we must include of course Marxist elements, which if can better in the following words of Pietrykowsky (2003) be appreciated: "neoclassical economists were increasingly drawn to human capital explanations of education and income determination. In contrasts, Bowles and Gintis (1976) argued that schools helped to socialize individuals into their class positions. The type of school attended determined the character traits conducive to the reproduction of one's class status. Rather than portraying schooling as the outcome of exogenous tastes and preferences,

education was seen an adjunct to the capitalist production system in the sense that schools "produced" workers and shaped and/or reinforced individuals' willingness to accept patterns of inequality and power (Gintis, 1972).", (xx)as is usual the miracle of deviced schhooling, and their designed (xxx)tâtonnement effects,...

Yet there are still "mécaniques" to be addressed and found, such as the one conceived at Gintis and Bowles (1981 as cited in Pietrykowsky, 2003) that "The extraction of labor from labor power is inherently conflictual and contingent, sinse the objectives of workers and capitalists are different." p. 483

The "mécaniques" in here exposed go beyond simplifications surrounding the limit such as the knife-edge property of the Harrod-Domar fashion that usually conceive a non-meaningful concept of balanced or steady-state growth path at the natural rate (see Hoover, 2003).

"Mécaniques" keep an intimate relationship with geometry (or geography if you wish to call it); it all relies in it. This is better exemplified in the following accounts of Bowles and Polanía-Reyes (2011), "Among the japanese shrimp fishermen that Jeffrey Carpenter and Erika Seki studied, those who contributed more in a public goods experiment were more *like*ly to be members of cooperatives that shared costs and catch among many boats than to fish under the usual private boat arrangements Carpenter and Seki (2010)). A similar pattern was found among fishermen in the Brazilian north east, where some fish offshore in large crews whose success depends on cooperation and coordination, while those exploiting inland waters fish singly." p. 32. Though sadly the experiment observation didn't go on any further.Bowles and Polanía (2011) add how "targeted free riders and even free riders who scaped punishment feel shame, which

they redress by subsequently contributing more." p. 37, and there the product. with a clear differentiation experimenter-observed subject.

The satisfying "mécanique" function i.e. obeying-evolution on these patterns, is $F : A \to A$. This representing function takes and yields a Hayekian vector of information[60] indexes, for the *ith* entry of each of these vectors is the index of the *ith* aspect *which* belonging to a closed interval, captures as average of incidence the within an evolution period. Moreover, this function could be discontinuous on its entries within its defined domain.

If one is to in thy entries consider rights which are mainly related to otherrestrictions such as natural disasters, globally the normative point of the indicator is usually provided by as second best, what *will* be named the absence of discriminations to thus obtain such service, which is in principle still far from its limit.[61].

The conceived function implies that the considered biological spells' length is to show the changes and synergies in question.

Definition 20 *A stable metric space H is such that $n(h_t) = n(h_l)\ \forall t, l$ where $n(h_t)$ is the neighborhood of $h \in H$ at t.*

A stable metric space is the result of a convergence towards a fixed point in terms of t successive dymensional applications, in that sense caused by certain social reflexivity. But the following local theorem builds up on an alternative continuous formulation namelySchauder fixed point theorem, however focusing on a closed stable metric subspace to provide the necessary conditions for the "mécanique", to reach its "unalterable"

[60] As they put it for prices but this specific time, in relationship with the following.

[61] Pareto unanimities can upset the Hayekian vector, though due to internalizing externalities, such effect wouldn't last for long (see Coase, 1960)

time point[62].

Theorem 21 *For two stable closed sets in a metric subspace which satisfy $A_j \subset A_i$ if $j > i$, a function $F : [A_i] \to [A_j]$ with $j = \begin{cases} i+1 & \text{if } |A_i| > 1 \\ i & \text{otherwise} \end{cases}$, has a fixed point $\bar{x}$ iff there is a defined distance function $d : A_i \times A_i \to \mathbb{R}_+$ between* any *two elements of A_i, and a constant k such that $d(x_z, F(x_l)) \geq k$ for* any *$z, l \in \mathbb{N}$, which satisfy $l \geq z$, and $x_z \neq F(x_l)$, where the sub index z indicates that x_z is the image of the zth replication of the function F.*

Proof. The domain of the first iteration is the closure of a set A_1. Taking an arbitrary first evaluation of the function $F(x_0)$, we know that this image so as the following ones cannot be contained inside of the k radio ball of x_0, unless they are on its closure or are equal to x_0. Assuming that the function is such that there are as many as possible images which satisfy $F(x_i) \neq x_i$ contained in A_1, where all the images are contained in the closure of the balls of previously evaluated points when these closures are contained in A_1, then each image will restrict the range of the subsequent one until no different images can be contained in A_1, and from this it most be that the number of possible distinct images are finite. Therefore, the function can be replicated until achieving one of the following cases.

(x): When there is not another $F(x_{i+1}) \neq x_{i+1}$ which satisfies $d(x_l, F(x_{i+1})) \geq k$ for any $l \leq i+1$ and the range of this iteration has more than one element, then it most be that $F(x_{i+1}) = x_{i+1} = \bar{x}$ is a fixed point.

(xx): Since the image of a given x_i satisfying $x_i \neq F(x_i)$ is contained in the closure of a set A_j, for the case of $|A_j| = 1$, then it most be that $F(x_{i+1}) = x_{i+1} = \bar{x}$ is a fixed

[62] Thus fairly accounting for detonated changes on the accumulable social patterns of interest.

point.

$[xxx]$: The domain of the initial iteration can be such that $A_1 = 1$, and in this case it most be that $F(x_j) = x_i = \bar{x}$ for any pair $i \neq j$.

To fully prove the reciprocal, a fixed point is taken with any finite set of introduced images produced by a finite number of iterations. If among these images there are points which are different with each other, then each image which is different than the fixed point and is not the considered initial point, is the result of evaluating a function which goes from the closure of the union of these points to the closure of a set without the evaluated point, for these elements cannot be repeated, and thus in that order the constant k is said basically to be the smallest distance between any one and one of the taken points including the initial and the fixed ■

This *propper* formulation for the representation of the "mécanique" that concern a mentioned normative point, further, being consistent with how "The efficient harvesting of rewards from the environment is central to the survival of any organism" (Lohrenz and Montague, 2008), it already implies the attacks between faiths of growth i.e. the seed of periodically destined to fight Kaldorian commandments and conditional convergence faith.

Mainly provided away from say which entry contributes the sex-soul specific treatments, by denying the of the social learning and the necessary characteristics to reach the fixed point being present in all the regions argument denial, where in time all his changes are strict average improvements toward the limit, need not her relativity to be measured, for it is only a matter of time for all the regions to exactly reach a global normative point that cannot in comparison present more social improvements, whose

"Aires" have up to now issued tributary, and other policy implications. Engineer this has basically an evident level of compatibility with the existence of among elements of a stable core Nash and/or Pareto *dominations*, that given (RN), as took for cuasihedonic coalitions will thus always satisfy her independent or/and $|S|$-coordinated (cardinal) moves, therefore implying an evident destination of the matching function[63].

Before going any further it is essential to verify the emptiness existence, what happens to be gist of this thesis on the limit, for it guarantees the fixed point with stability, and whose theorem and proof we find at the dungeons of the Section F of the Appendix, stating a ground of possibility to any impossibility (why mainly differentiates the theorem 21 from the Nash one, is the fact that ours requires stating the emptiness existence). Let us focus in this point and thus not in *a* digressions, for when I first came up with this construction we were sure that its respective spirit had endowed the so far discussed social bricks with the reliable feature of them keynesian basis that Ackerlof would convey at his novel reception. I was wrong however, where only by performing some close up to this point (with principles still filling its participation at the behavioral macroeconomics framework) in question, I got to realize we had formally introduced myself to certain large numbers waters. For if someone has prominently framed and legislated the true capture and thus the nature dynamic, in comparison to any known as decentschool of economics, even the Austrian one, is Piero Sraffas'

[63]The dialogue between the individuals occupying governmental positions to get feedbacks about policies that could influence the social patterns, could impact the risk neutrality (RN). This is, "mécaniques" that reach the same fixed point, are thus similar, which means that satisfy some indifference law as the one claimed by Jevons, that would be the defender of section F (see, Wicksell, 1989), though it becomes evident that for us the real business cicles cannot come governed by sunspots taking place along with some greenhouse effects denial "Aires", for it is still incredibly schizophrenic to think of the "méchaniques" as obeying the marginal utility fashion of Jevons. Further, the direction of the moves in question has also an evident direction, that it most be that we can grasp it from mathematical tool examples of ideological factors that affect in such a way, a social dynamic e.g. in evolutive game theory (see Bowles, 2006).

economics and his well known dimensional cost minimizing choice of techniques at the envelope, determined by the among wages and capital prices (in singularity) trade off outcomes . It exists, however, beyond those "Aires" a one *determined* physics-based probability that [at this space], the gist of this thesis basically moves and ranks ahead based on the need for the *li* mit stability when facing the violent ground shaking that this decisions surrounds whithin in principles attempt .[64]

Equal diverse perspectives that rate, all reality as the result of spaces' laziness allowing its stretching and expansion, which in turn sheds light on how can this only be caused by surrounding black holes pulling such spots are common, though these claims are broadly known as the exaggerated so called cutting edge profiles, and are nothing but a sketchy misconception that makes neither sense nor a coherent composition provision road, rather mostly relying on the general equilibrium fantastic tale.[65]

In parallel this newly defined ordinality property, fairly obeys therefore such notion of posteriority of a waiting economy;[66] in a sen s e of set's cardinality mechanism (in referenda to the previously addressed axiomatic bricks) that actually add up basically leaving a clear comparison in a louder relative scale to archaic rankings namely those *determined* by Ramsey (1928) and the *like.*(see Appendix H,I).[67]

[64] As for (RN), another particular studing position on decision making that does not obey the classical probability Kolmogorov axioms can be consistently found after Bruza and Wang and Busemeyer (2015) quantum modelling attempt.

[65] What we until the second chapter named Buridan's ass path (I first learned about Buridain's ass watching The Big Bang Theory (see Lorre, Prady and Cendrowski, 2016).

[66] where would Dr Cassel have defined the year-pound units (Dr Cassel as referenced at Pigou as referenced at Keynes General Theory pp. 112 and pp. 120)

[67] It results needless to say that as it is well known, if questioned, neoclassicals will always say their abandonment of a look for the one numeraire i.e. their science of relativity, to be at the very gravity center of the issue and thus, living at her paretian world. This in turn means that they are rather cocerned with diverse claimed phenomena. Take for example how unlike Turnovsky as referenced in Irmen and Kuhenel (2009) that "the presence of convex costs may prevent the existence of a balanced growth path." p. 23, our results from the until the second chapter "Aires" already indicate the BGP as an incredibly remote possibility, which is never to take place at least for certain techology levels. For example, a straightforward indicator of the effect that the population density might have on η can be found in Steckel et al. (2017) empirical findings that "countries with higher population density do not have better access levels. However, growing population density within countries leads to improved access

Notice that under this meaningful view, provided that these changes on the patterns decrease mechanically the expectations from forming the *untouchable* influential wealthy groups, then the application of the fixed point theorem wildly implies the disappearance of the equilibrium *of the visible grouping subsect.*[68],[69] which as until the second chapter could in principle take place gradually, and thus the presence of discontinuity on decisions would even have an evident geometrical impact in terms of year-pound social benefits say π. As Cullis and Jones (2008) notice, "Only the government can correct an 'acquisition race'. ('ego' suggests that happiness is far from maximized.

This is, inspite a possible presence of social schizophrenia as the high rewarded scientific one prioritized by Douglas (1948) for the wages determination mainstream teaching and learning, but this time in termsof which patterns obey theworld, where for example poverty is well explained by laziness patterns and on the other hand, by determining pressures, in any case provided that as in the overture, for full populations presenting strong social patterns of unequal treatment, stabbly high bounded to the cardinal decisions, improvements of the recognized *are to* result, deriving it in the fixed kind of technological change which presents *a limit*, in quite a broader normative point.

levels, particularly in rural areas."..."costs to close gaps in infrastructure services might be lower than expected in static analyses given economic growth and urbanization patterns in developing countries. They can assist policy making by developing plausible future scenarios of access gaps," p. 115-116

[68] Grouping can as well be seen as scale economies (or misunderstood under the roof of network externalities as mentioned in the last sect. of the second chapter) from the mainstream lens, which are usually taken as law and justification for undertaking private-governmental joint ventures. An example at Chile (Country were the Mont Pelerin society of Hayek would meet each year during the rule of Augusto Pinochet), where water irrigation for small avocado producers has stopped, whereas it has been concentrated for the large ones, who reference their success to the well known scale economies concept (see The Avocado War, 2019). A similar case can as well be found in pueblo de Kolla at Los Andes Argentina, a town where women work in cooperatives, with particular traditions such as praying at night not to loose their spirit (which makes them be afraid), where scale economies over the mineral exploitation of their lands are to materialize once they agree to leave their increasingly desolate, and of less value lands (for rather living in the city), for mining threats their water sources and life style (see No a la Mina, 2019), and there is testimony on a serious absence of governmental planning (see Bremer, 2018).

[69] In reverse, getting to the equilibrium figure product makes conceiving the limit just unachievable, unless partially on talent hunter groups, inspite the fact that the implied geometry requisite for this to be results incredibly remote though (Applications encompass colleges competition).

The classical economists and Marx believed that economic, political, and institutional forces were to push real wages towards a constant value[70], and contemporary formalizations of classical-marxist growth basically took this notion to constant wage shares (see Tavani and Zamparelli, 2016), Moreover, as rationalized by Tavani and Zamparelli "An exogenous share of labor in real output has the traditional interpretation of a subsistence wage (adjusted for labor productivity) in Malthusian frameworks, or the value of the productivity-adjusted wage that guarantees the reserve army of labor to remain constant over time in Marxian economics." [2016]

As in Röhrs and Winter (2014) "All other things equal, a fall in the interest rate and an increase in the wage rate increases uncertainty in total income."..."and households experience an ex-ante welfare loss" for "uncertainty about consumption is amplified as well," p. 14 and risk effects from reduced rates slaved to a financially developed conclusion do fairly outweight say common normal returns i.e. owned royalties in a stable-ricardo effective necessary fashion.

This relatively complements the non cost-less fashion technological change that we undertake which is nothing but just a close-up to what develops in postulating labor-saving technical change depending on the labor share. As Tavani and Zamparelli (2017) say, "This relation fits well with the notion of cost-minimization and is founded in the classical-Marxian analysis of the choice of technique. New techniques of production are adopted only if they do not decrease the profit rate at the given real wage (Okishio, 1961)" p. 1279, where in that direction, thus the productivity increases due to wages increments. In contrast to Röhrs and Winter (2014)'s diverse claim, as one can fully see,

[70] Tavani and Zamparelli (2016) see wages as the workers consumption standard, concept from which we fairly move ahead.

our fairly induced axiomatic approach together with further findings overcome the flaws pointed out by Tavani and Zamparelli (2017) that "Kurz and Salvadori (1998) insightfully noted that income distribution in early neoclassical endogenous growth models depends on technology and profit maximization only, and it is therefore exogenous." p. 1277

Away from some by trauma caused colored synesthesia or aphascia, contemplate weighting-assigning transfers to the unemployment profiles as in Tavani and Zamparelli (2016), where wheights are based on the share of unemployment in an evident fashion. Although feasibly, it went unnoticed, how some dramatic "La llorona" effect takes place [When the evil "La llorona" is far away you can listen to it as if it was right next to you,] instead if it is close, it shall sound as if it was far away.][71]

Bayesian estimations from the repeated thrust games that tend to fairness (see the previous subsubsection on the "mécaniques") can be traced back to Johan Heinrich Von Thunnen studiess' derived natural salary expression i.e. the marginal contributions approach such as the Shapley value *likes*[72]. As impossible to recognize as this may result, a non-particularly political pragmatic (axiomatic) approach (such as the one of our moving ahead core in comparison to the Sraffian (neoricardian) economics) is basically required in order to verify whether convergence toward the just mentioned distribution takes place[73]

[71] In the same manner that we for example, meaningfully rely on critique or comedy about a region's leader incidence, as an mainly healthiness indicator. Listening to popular leyends of "la llorona" to which this quote belongs I inspite grew up.

[72] What is a central concept that satisfies four famous fairness axioms and thus non-random uniquenes or unicity of such satisfaction.

[73] In contrast, a general *academic rule* on productivity is usually fully derived as in the lines stated by Wicksell on the recipients of fixed money incomes: "But if they are not in a position to hold back their own "wares" from the market, a new position of equilibrium will soon be attained, and they will be receiving a smaller share of the rest of the yearly production of commodities while the share of the rest of the community will be correspondingly increased." (1898), though as would have been remarked by Lucas (1988) work on growth and human capital. It is well known that british Cambridge won the capital controversy.

3.3.3.2 POSITIONING OUR WORK

Perhaps a study that remains ahead of our approach implies succesfully matching ventral striatum orbitofrontal cortex whose activation is associated to a diverse spectrum of rewards (see Lorenz and Montague, 2008), to allow further studies on how our necesarilly macroeconomically developable approach[74] establishes allignments i.e. the by "mécaniques" implied well known microeconomics area, and thus, further studies on the true dynamic spirit.

A long lasting support to our approach is that "Additionally, the natural reward landscape is in fact a social one, and hence neuroscience should be deeply interested in social interaction. Neuroeconomics therefore can provide a conceptual structure for neuroscience as it attempts to integrate the fantastic discoveries it has made at the molecular level of an economic agent embedded in society." Lorenz and Montague (2008).

For this adjustment a possible extension of the "mécanique" analysis, could it be provided by axiomatizing her equivalence between social efforts and the distance of changes, which we leave as an closed question, in time being this geometrically consistent with Cullis and Jones (2008) empirical findings that "Homoeconomicus is alive and happy and living in the USA whereas Homorealitus is alive and happy and living in Sweden."

Our "mécaniques" imply that corollaries such as the one of Gómez (2016) that "with all agents being identical, in equilibrium aggregate private quantities are simply multiples of individual quantities", are nothing but falacies. For a geometric example see

[74] "In computer science increasing attention has been paid recently (Shoham et al., 2007) to multi-agent reinforcement learning, or multi-agent learning (MAL)". (Lohrenz and Montague, 2008)

the example 5 of Bogomolnaia and Jackson where identical agents are one infront of the other forming the ring where each agent desires to match the one in the front, and are to realize no achievable matching. Therefore climbing the mount of this "mécanique"-*fixing* be provided by for example "Aires" of shortening the distances in question, taking the ring to its doom, and rather turning it into a circuit. It becomes evident then, that usual solutions such as strategy-proof mechanisms would leave the "mécanique" of the example 5 and equally conceived ones, unchanged[75]. In reverse, another conscient of a "mécanique" *fixing* but for the international agreements context, lies in the policy recommendations at Rosas-Martínez (2016), which basically proposes a necessary touristic limit, trade limits, and other related to integration interactions controls (This author at the time calls it subregional agreements), in order to, through evolutive game theory contagions, set aside related to capital destroying envy propensities, which could start with charitable subregional agreements.

Depending on what is considered of higher gravity, the limit can take completely different forms.[76] This appears fully appreciable in the Medema writings that "mercantilists goal of nation-state building, contained with their notion that national political-economic strength entailed running a trade surplus payable in bullion, engendered a view of government policy involving extensive regulation of economic affairs." p. 430 to which he later adds "As Lars Magnusson (1993, p. 6-8) has printed out, merchantilism departed from previous thinking by viewing the economic systems as

"an independent territory with its own distinctive laws"". Medema, (2003, p. 430-

[75] Some close to this "mécanique" process is the known as Myrdal process of cumulative causation to study "individual" preferences.

[76] The imposed levels of individuals' use of a service, which could be attributed to profit or social profit maximizers, such as the introduction of η for the LPC model, allows for a game theory obscuring illusion which we overcome through what mostly named "mécanique". This in turn means that until the second chapter, η took the ultimate complements "mécanique"-fixing role for some fair scale growth model.

431) Moreover, such spirit can become conceivable due to the as well following writings of Medema:

"That political and economic objectives were mutually reinforced can be seen by nothing that bullion accumulation was accompanied by the development of military (including naval) power, which protected both nation and trade shipments, the aquisition of colonies, which brought empire, sources of raw materials for manufacturing, and markets for exports; and the slave trade, which supplied low-cost labor.". Further clarifying examples can be derived from Medema's writings on other physiocrats that "Francois Quesnay and other physiocrats saw the maximization of surplus as providing the means of advancing agricultural technology to match the production of other nations. Unchecked, would make excessive expenditures on manufactured goods (luxe decorations); this combined with the mercantile system in place, worked to impede the growth of the net product." p.431. On the other hand, one of high participation is that point of Nassau senior as referenced in Medema that ""the only rational foundation of government, the only foundation of a right to govern and a correlative duty to obey is, expediency –the general benefit of the comunity"". p. 435

Only can Keynesians achieve the full merit of giving opportunity to a less institutional path[77] that would have been later proposed to be developed by Ackerlof (2001) under the behavioral macroeconomics frame, spirit that so long hasn't yet found accumulated bricks of interest, which is entirely[78] the aim of our deal that should even order

[77] At the closure of his Chapter 18, Keynes (1936) writes: "But we must not conclude that the mean position thus determined by 'natural' tendencies, namely by those tendencies which are likely to persist, failing measures expressly designed to correct them, is, therefore, established by laws of necessity. The unimpeded rule of the above conditions is a fact of observation concerning the world as it is or has been, and not a necessary principle which cannot be changed." p.160

[78] We are to substitute the word completely for entirely hoping this not to be confusing for the international reader.

growth causalities building upon a fair deck of (always) matching claims i.e. never in equilibrium "mécaniques". As Akerlof wrote:

> "In my view, psychological and sociological explanations for efficiency wages are empirically most convincing." (p. 371, 2001)

Our developments show however one disagreement with Akerlof that "In the spirit of Keynes' General Theory, behavioral Macroeconomists are rebuilding the microfundations that were sacked by the New Classical economics.", were automatically, the order of such disagreement is better appreciated by focusing in what follows "Caplin and Spulber (1987) and Caplin and Leahy (1991) have also looked at the implications of S-s policy for the relation between the shifts in the ideal price and the actual price being charged. See Akerlof (1973,1999) for analysis of the effects of target-threshold monitoring on the short-run income and interest elasticity of the demand for money."..."Asymmetric information provides an excellent reason for credit rationing" ()p.367, 2001

unlike the case described by Akerlof that "minorities are *like*ly to experience statistical discrimination in the labor market because are lumped toguether into categories of those with similar observable traits." (p.368, 2001) we have modelled when the local *status quo* caused discrimination for majorities. This is, strategically we might as well say that, we have based our model on just necessary symmetrical information (fully awareness of elites), though in an anonimous direction that the cardinality-morality obstacle (see footnote 66 order of the second chapter) in that sense rather than a full ricardian spirit or Marxist unlimited *endowments* accumulation feature is, what has taken place, which with respect to that as well departs from the famous Case and Fair (1997) macroeconomics principles treaty, considering their desirable cicling stability of a $p's$

arrangement to eq. . though unfortunately for *a* one self-suficently employable fashion economy with an empty *outcome*. So we follow when Akerlof says "Even where meachanisms such as reputation and repeat sales arise to overcome the problem of asymmetric information, such institutions become a major determinant of market structure." (p. 368, 2001), he refers to some 'legal decoy', disclaimer which enforces equilibrium in the coasian bargainings fashion, and therefore, rather inconceivable.

One prominent question is how far is the assymmetric information from the group's asimmetric information doctrine though. In this case, that happens to issue the crowding-in of the eq. of groups' gist, i.e. the away from the limit and related to avoid the groups no-eq. uncertainty spirit, game theoretic card.

Just among the points that state the Behavioral Macroeconomics principles, Akerlof (2001) says "any account of the business cycle based on voluntary variations in job-taking faces a significant empirical difficulty-to explain why quits decline in cyclical downturns." p.370, where rehabilitating our profiles model by locking it to the disclaimer-jobpositions range of this context, this reaction makes entire sense. Therefore the equilibrium implies that there is not such thing as a procyclic behavior of quits (which is as suggested indisputable in Akerlof, 2001). In short, say that Mclauhlin's model as referenced in Akerlof (2001) was right about the declines' positive effect on wages. In an without claims equilibrium this mean by itself would just diminish productivity, though it wouldn't be true for an entire look at meaningfully reassignated profiles capture, rather resulting incredibly productive!

Institutional economics is out of the scope of Behavioral Macroeconomics. That is, in the same way that other schools of thought *like* Marxism happen to be contained in

the gap between Neoclassical and Austrian economics, Behavioral Macroeconomics fair contention is at the gap between Keynesian and Institutional Economics to which other fruitfu| phenomena such as Blaug's critique to general equilibrium with Petri's referencing Garegnani's thought answer to Blaug where Sraffian economics is in comparison clarified.

Whether R&D enters the factors whose "mécaniques"'s we model, for its presence as certain ancient and therefore long lasting philosophical spirit, this academically tractable to the Aristotelic thought tradition, and therefore Plato-Aristotelic element, that in exchange accumulates to the as well talented-fair question in the closure of the first sect. of the second chapter, whose gist is in comparison incredibly particular, namely, the definition of the basic education, and therefore, in closure out of the scope of this thesis[79].

Can equalizing conditions be found in a single happening which becomes observable as is well known by BBC Studios (2013), that eventhough the subject presents all the brain scan and genes' traits of a murderer, he is far from becoming one, being this attributed to whether genes are triggered or not, rather depending on what happens during childhood, which instead seems to recall the providable Neural roads Plasticity concept[80] (see Power et at., 2017), in turn reversing to establish support

[79] i.e. it would require further research to find out these belonging rules of the R&D access to the accumulable in the 21 Theorem closure's "Aires". However our "mécaniques" even consider how the economy produces people, such that incentives alter how preferences are learned (see Bowles and Polanía, 2011)

[80] "An essential feature of the brain is its capacity to change. Neuroscientists use the term "plasticity" to describe the malleability of neuronal connectivity and circuitry." (Power and Schlaggar, 2018), so they study how current patterns of neural firing impact future patterns of neural firing, i.e. coding and storage, finding that "plasticity encompasses many distinct phenomena, some of which operate across most or all of the lifespan, and others that operate exclusively in early development" (firing occurs just when excitatory signals overcome inhibitory signals, with signals comming from other neurons). *Moreover*, we must notice that if for example informational time travel is possible (from future to past), causality is thus (not by luck) reversed.

for Kulynych (1996) that "Because neuroimaging evidence straddles the border between "hard" sciences *like* physics, physiology, and biochemistry and the "softer," more behaviorally-oriented realm of $p\int y$chiatric and psychological testimony, courts ruling on its admissibility face a special challenge." p. 9[81]

So it is the fault of provided practices concerning **getting to solution**s such **as the Navier-Stocks equations**, that could be well applied to an across multiverses brain capacity, concerning whether it exists, or it is smooth, a solution for which we in here do not provide a single clue thus *limiting* our approach to leaving *empty* the set of answers to such questions. For we are economists and apparently it would suffice for us to say that existence is *stably* proved by theorem 21, and secondly that smoothness is *entirely* shown by always meaningfully reswitching to a smaller than a δ defined, k for some δ-smoothness.[82]

Mainly as one should relatively suspect now, our close up finds its origin in a heartfelt suggestion arising from the Arrow Impossibility differentiation with the Pareto Unanimity concept, in the same fashion that it as well arises from the *eternal* claimable disagreement between the therefore rather obscuring branches of game theory and mechanisms design, to which even if accused, our "mécaniques" do not belong.

Our *eternal* "mécaniques" do not dismiss the ocurrence of certain rationality[83]. As implied in the words of Samuelson as referenced by Rizvi (2003) on evolutionary-type reasoning against players as maximizers. "the response to this confusion was "to abandon the model of rational players optimizing against stable preferences" of

[81] She focuses on this controversy, addressing it by introducing the polemic case of the would-be presidential assassin John Hinckley, Jr., whose white and grey computerized tomography scan, suggested that he "might be diagnosed as schizophrenic" later resulting in that "the jury found Hinckley not guilty by reason of insanity." Kulynych (p. 1, 1996)

[82] It should be noticed that each derivative can be thought as a points' set or coalition.

[83] For example the capacity to keep *o*p the human government vs the non-human as generated in the in honor to the tequila worm sect. of the second chapter.

whatever sort" the result has been the development of evolutionary game theory."". However, as an accident after another, while equilibrium implies a biological survival of the fittest evidenced by stability in population compositions, for us such evidence would be nothing but just stability.[84] Evenmore, considering what written by Rizvi (2003) that following general equilibrium theory's troubles with arbitrariness, we see a different landscape – a situation in which experiments helped to de-center rational-choice game theory in favor of evolutionary arguments." p. 389 we are to state that whether evolutionary game theory belongs to our Behavioral Macroeconomics depends on its recognized origins.[85] That is, if emerging from institutional economics, this branch as its origin are completely out of our entire scope. Instead, if just defined as a dynamic rule rather than decisions' taking based on a mainstream rational choice card, we might say the contention in question to be true, or instead, in reverse direction, thus contention as well of any of this rule-type entirely in the limit space to be always true[86]. But *unlike* the limit, group's equilibria existence is entirely out of our concerns,[87] for its local though incredibly inspiring over the years, irrelevance to our "mécaniques".[88]

[84] Our relationship to evolutive game theory thus due to our away from institutional economics "mécanique", has just nothing to do with the interior to American Institutional Economics diverging networks, i.e. the one of Nelson and Winter "evolutionary economics" that emerged in the 1980's with a more biologically oriented use of the emphasis on theoretical microfundations, away from although redolent of, that road of Veblen (see Hodgson, 2003).

[85] For example, in what concerns aborting tendencies such as the in the face of currency introduction, attempts associated to nationalist resistence (e.g. Meier and Kirchler, 1998; Müler-Peters, 1998; Van Everdingen and Van Raaij, 1998, all as referenced in Kemp (2003)) where as specified, that people do not always view economic events from a strictly economic perspective. In reverse, in any case, decisions over non economic situations do not involve any sort of previous trainning though, and as a reference are thus in that sense, fairly out of our scope (this in turn means that the mentioned nationalist tendencies are indeed though not under such lens, part of our "méchaniques").

[86] To claim our "mecániques" contention to institutional economics would leave just an important emptiness that could even be obscured by classical probability (obeying Kolmogorov axioms) applications, which results parallel to the incorrect mainstream belief that the denial of the denial is the affirmation, and thus an of high relative gravity issue.

[87] As appreciated in Blaug (2003) "For Weinstraub (1991, p.108-9), "equilibrium is a feature of our models, not the world" and stability of equilibrium is something "out there" in the economy." p. 402

[88] This means that our developments can be traced under the *impermanence problem* alignements as follows: "The impermanence problem thus arising can be clarified as follows: since actual economies do not reach equilibrium instantaneously, the actual path of the economy cannot coincide with the equilibrium path, so a theory of the actual path—that is, of the behavior of economies not continuously in equilibrium—is indispensable to assess whether the equilibrium path (even assuming it is

Whether accessing more in fairness adds a fair merit or not to a generation of models is nothing but a fair concern to whom we are to answer, for our "mécaniques" clearly depart from some usual Case and Fair (1997) approach to economics. Microeconomics attempts to align to Behavioral Macroeconomics, for example by checking in the middle of the storm, troopers' formed individual ships' intra-arrangements might take place, thus just calmly constituting the only impact assessment for its obvious relationship to growth. So whether a socialist economy is deviant under our work lens, is a particular case worth of further study and talented resources employment, considering wages, independently of output in transferable utility form[89].

We couldn't agree more with what stated in Akerlof (2001) that "group norms typically determine the conceptions workers form about how gifts should be reciprocated and what constitutes a fair wage.", this is, that groups break former individuals into "mécaniques". So an *in-out* sider efficiency wages model operates under an incredibly less powerful lens than the one that we in here attempt to at least locally-partially develop.

Enriching our "mécaniques" op to the fixed point stability we find the rather inherent Buddhist position as described in Petri that "Marshall, Dennis H. Robertson, Wicksell, or J.B. Clarck took it for granted –as did Adam Smith, David Ricardo, or Karl Marx – that it is not only uninteresting but also impossible to describe fully the

well determined) yields a good approximation to it; but modern general equilibrium theory is silent on actual paths because disequilibrium actions alter the data of equilibrium, so the equilibrium path itself is altered by disequilibrium. Thus, the traditional way to overcome the impossibility to specify the accidental events of disequilibrium—by arguing that the actual path gravitates toward an equilibrium defined independently of the accidents of disequilibrium —is lost. As a result, modern general equilibrium theory appears unable to indicate the behavior of economies not continuously in equilibrium (Petri 1999 , pp. 24, 50). Franklin Fisher (1983, p. 14) openly admits the problem, and his book confirms its relevance because his attempt (the only one to date admitting capital goods) to surmount the difficulty by considering non-tâtonnement processes going on in real time is unable to reach any definite conclusion (Petri 2004 , pp. 67–71)." Petri (footnote 4, 2014)

[89]For example, for Piero Sraffa, utility does not even form a fair description on how decisions are taken (see Asimakopulos, footnote 11, 1985).

forces determining each production decision, or the details of the moment-by-moment behavior of market prices." p.11 though this position is later clarified and abandoned "the actual path of a price or quantity would tend to gravitate around and toward definite values, or "centers of gravitation"." (p.11, 2014)

Inverting this, in reverse we get a new light in the issue, that it is not an institution, it is not behavioral economics, it is not equilibrium or a cutting edge dynamic, and the only way to address it lies in the aggregates. A "mécanique" needs not be justifiable in the second-order (of small costs practices awarenes) Akerlof (2001) spirit to whom results are still quite schizophrenic, as they just take place. However the "mécanique" to Behavioral Macroeconomics belonging meets its origin in how, what described as near-rationality by Akerlof as the cause of price stickiness, that in turn is sufficient to import significant power to monetary policy, is though conceived from a much relatively poorer lens, closer to our "mécaniques".[90] Is it fair in principle to obey that as said by Akerlof (2001) "Modern behavioral economics has rediscovered the wild side of macroeconomic behavior." from which we can geometrically rescue how we are thus locally endowed with that in order to medically intervene a wild beast, awareness of its basic "mécaniques", that has to be present.[91]

Under this lines we develop, though we attempt to move forward toward a more realistic approach. So we must suggest that even experiments should be designed from

[90] As Dimand (2003) concludes, "Keynes transformed macroeconomics, but a substantial and valuable body of macroeconomics already existed to be transformed." p.336, however this means intead that the origin of our theory can be validly traced back to the Keynesian wing, when considering how what before Keynes was not truly Macroeconomics, thus forming part of contemporary spirits, which is something it has fully in common without erosion, with poverty traps making.

[91] High gravity points would stretch the space in between until forming some geometry of light issuing lazy points. Say that as Dimand writes "Austrian monetary overinvestment theory argued that expansionary monetary policy made subsequent depression" p. 334 for it would slow down the elapsing time of selling due to the incresed investments, which is a point of gravity. If in addition a distorting tax is imposed next to such monetary policy, the inevitable applied redistribution would allow that appreciation spirit for a basically meaningful interaction, which we can, fairly in principle, conceive in terms of its distance from the limit.

a Behavioral Macroeconomics lens i.e. looking for drawing the "mécaniques" in question[92], rather than from a behavioral economics one that looks for suggesting and integrating deviations from neoclassical mainstream economics, or from institutional economics which are as well entirely out of our scope.[93] We believe that, in short as we have done so far, Behavioral Macroeconomics is to be addressed from the macroeconomic behaviors rather than from extensive psychological individual-micro settings, which in turn just thus left behavioral economics as a discarded approach so as other claims such as the one of Paul Glimcher about Neuroeconomics belonging to neoclassical economics[94]. Therefore, ours is not an atheoretical approach such as the one of Slutsky (1927 as referenced by Dimand, 2003).[95]

The technique capability to consider the great coalition N value becomes desirable[96], however even if fairly imposing transferable utility[97], further formalizations would be required to achieve such among people additivity, specialy if accounting for the at footnote 89 Sraffian remarks, which in reverse leads us to the dis**t**ances from the limit space as an ideal base to fairly deal with and rank (see Appendix H) the "Mécaniques"[98].

[92] For example, certain findings suggested that diet very much influences basic behavior, such as natural criminal propensities and fairness aversion, where a diet rich in fats and carbohydrates destroys neural roads. and provided experiments show how rats' memory is affected by ingestions, and how their sugar consumption causes an addiction shown as more serious than cocaine or heroin, where human neuro scans show that brain activation due to sugar intake gets reduced for usual sugar consumers (in similar "Aires", Seibold (2016) exposes how a similar patern can be observed for financial losses in the balloon experiment), although their activation increases for exposure to sugar-implied advertising (see Hitier, 2019)

[93] This does not dismiss the lagging far behind relationship that "The development of the economics of Keynes by the post Keynesians is compatible with institutionalism, but the fact remains that institutionalism has been a passive receptor of these theoretical developments." (Keller p. 1091, 1983) that thus results in reverse unavailable in time, if one is to diagnose the state of the art in symbiosis to the background harmony.

[94] (see Penn Center for Neuroscience & Society (2017))

[95] *Slut*sky after who the substitutability equation was named, as well demonstrated that a summation of random shocks could produce a series that looked ciclical.

[96] A proper example for additivity is the one of sharing a cab from a to b, where x-selectively it is always convenient for an agent to *specializedly* diminish the costs of her A to B trip.

[97] As in The fortified formation of exclusive groups subsect.

[98] Including These Sraffian remarks makes the limit (see the Appendix G) topology different from the

The emptiness existence is as a matter of fact essential not only for our "mécaniques" but for other presumptuously part of our provided neighborhood thought rode, *like* mechanisms design card, whose strategy proof objective we have as well, as previously mentioned, always intentionally addressed.

Our adequate theory might result for many as an intruder apophenia in the Behabioral Macroeconomics, however, including this makes equal our responsibility that such a superadditive (tendency Toward N) posture meets the light at least in a polemic spirit, and not in its convenient abandonment for the due to geometry local *status quo*.

Some seem to have reconciled with in urgency defined axoms that appear to fairly work at the in the large waters navigating ship interior. This first Classical cum Marxist in the face of our approach makes no sense, and second, such guild misses what as would have been addressed by Blaugh when he wrote on the Cambridge controversy that "No one, whether on one side of the Atlantic or on the other, ever asked: what do we learn about the economy if we decide that reswitching does not or does occur, and what follows about economic policy?" Blaug (p. 405, 2003). This means that *unlike* such entrepreneured theories, we are to in comparison close the in question Mark Blaug's concern.

A unique ergodic space is implied by stability and the existence of the Theorem 21^{99}.[100] That is, along this of high responsibility work, we have extended the point, that in time the only conceivable limit lies in the maturity of modelling away from

well known achievement of a Pareto Unanimity (As we may recall, the increments and decrements on the total product could well vary across arrangements for distinct calibrations and adjustments, which makes such measure unreliable, even though it is not expressed in some "capital units".).

[99] Whose reelevance is undeniable.

[100] Such ergodicity applies as well to discussions on the mathematical basis for common dynamic regime models, such as the scale-explicit manner description of its application to sociological, ecological, and economic systems as can now be found from Brida, Mayer, McCord, and Punzo (2011) work in

catastrophic regime changes.

relativity representations such as the extra capability one of the second chapter, that is nothing, but was fully some main start, whose settings are to present a sequentially decreasing growth on popularity[101], hopefully at the hands of our "mécaniques"-fixing recognition among other heterodox perspectives approaches on time.

Reaching the fixed point within closedness means that in comparison to thought in question we deny that "Sidgwick (1901, p. 402) accepted that "the motive of self interest does work powerfully and continually." Yet, he argued, the fact that the system works does not mean that it functions optimally in all times and places." Medema (p. 437, 2003). Thus meaning that "mécaniques" aplications keeps within mind their belonging to a "mécanique" whose deck cardinality implies just a from a handful "mécanique" that in turn certainly implies optimality, i.e. the true economic recursivity. This training affirmation instantaneously yields a scannable compatibility with incredibly similar veins such as the provided road of medical finance that by studying the effect of drugs on decisions (see Tseng, 2006), under the Keynesian wing results a particularly appropriate and powerful element of our mécaniques gist (with respect to for example our $v's$ arrangements).

Untiringly even worst, *painlessly* driving a hypothetical Lange-Learner-based model crashing start that misses considering any-degree-slavery with day-insomnia-night *necessity,* as a dramatical result phonetically arises the meritful question or alternative on the fact that, our mécaniques ought to early be confused with belonging to institutional economics' spirits and with Behavioral Economics[102], makes us to have the next *governing commons* with the "A" school[103]: "The Austrian school finds itself in

[101] This sort of models are still suitable for a particular kind of central planner.

[102] For example, our mécaniques are just neither part of the new or old institutional economics agenda which Hodgson addresses in his conclusions (see Hodgson, p. 469, 2003)

[103] We refer to the Austrian school as the "A" school for Aires of simplicity.

a strange position with regard to its fellow economists. It believes that others have *stumbled upon the right* answers to many practical policy questions, but for the wrong reasons." Boettke and Lesson (p. 452, 2003) [104]

Eventhough Hoover concludes that "So far, no clear scholastic divisions have appeared in the economics of growth similar to those that plagued the macroeconomics of the short run from the monetarist insurgency through the heyday of the new Keynesians." Hoover (p. 426), I'm to in reverse highly disagree with this to abort long standing spirits, for time has revealed economic thoughts such as the one conception of Amartya Sen and Thomas Piketty on the uncertain glory that mainstream growth might brings (see El Capital en el Siglo XXI of Piketty (2015); so as its reflection in An Uncertain Glory of Convergence Clubs of Drèz and Sen (2013) where serious dealings such as *open* defecation are exposed), which contrasts pure mainstream views *like* the one developed in Barro and Sala-i-Martin (2004) powerful book whose doctrine for us fairly remains at the second chapter, due to the Cambridge controversy inclusion.

"Keynes said that "the position is serious when enterprise becomes the bubble on a whirlpool of speculation. When the capital development of a country becomes a by-product of the activities of a casino, the job is likely to be ill-done" [Keynes 1936, p. 159]."(Keller, p. 1090, 1983)

Empirical consequences can be grasped[105] for have we left macroeconometric implications of the limit to be openly tested in further directional tool developments such as the Data Resources Incorporated (DRI) model which flooded the market for model

[104] It may result enlightning to put it this way: whether listening to the the the Austrian and Mainstream economics schools at the mécaniques closed map would sound as pointillism and counterpoint, listening to our Mécaniques function sounds rather as Rachmaninoff.

[105] A theoretical assesment as we develop is to reverse what observed by Sheila C. Dow (2003) robustly on post Keynesianism that "It is characteristic of this period that theory was highlighted first, and then empirical characteristics of the economy and methodology (nowadays the order tends to be reversed)." p. 473

based forecasts and policy analysis in the late 1960's (see Hoover, 416) but for an adequate to our approach fashion.[106]

I have envied Joan Robinson who established the post-Keynesian label brick, and that say, more concerned to find an independent unit by which to measure capital, also put forward the capital reversal, thus moving aside from a purely Ricardo fashion, what is still (see Dow, p. 472, 2008) a haunted remembrance for mainstream economics.

Interlocking, on basically relative time, the complete endogenizer planner gets to the maximum, but the sophisticated planner gets to lock $o\mathtt{p}$ the limiT.[107]

[106] This implies the recalibrations that can include due to geometry non-included geometries, such as an inland lonely fishers' chance to wonder about more global pictures, say, including concerns about by off-shore fishers supported killer structures.

In the sudden our mécaniques, as well imply necessary recalibrations of choice procedures tracking due to eye movements, for comparisons *like* the ones in Arieli, Ben-Ami and Rubinstein (2009) cannot be reliable if undertaken in dollars, and if fixed (in terms of distances from the limit), are thus finally to fairly address Behavioral Macroeconomics, eventhough subjects with visual impairment would end up parted aside (Visual impairment can be caused by a lack of access to lens. As well "If a child is born with a cataract (a clouded eye lens) that is not corrected within the first postnatal months, the child will suffer degraded or absent vision in that eye, even if the cataract is eventually removed. In contrast, an adult with normal vision who develops a cataract will enjoy a full restoration of vision when the cataract is removed, no matter how long the adult waits until having the cataract removed. Thus, there is something special about the initial months of visual stimulation in setting up neural circuitry" (Power et. al 2018), which as the authors write, has been confirmed by left-right eye occlusion experiments on animals). Which in turn moves ahead from usual Hayekian forensic evidence analyses.

[107] For example, in the region of any sect. corresponding to the first two chapers, if applying a second best tax $\tau r^* = \tau_f r$ where τ_f is the jurisdictional over external bonds; the immigration tax to capital (this trainning in comparison sets r as the local interest rate).

Part II

CHAPTER 4

CONCLUSIONS

4.1 Cornclusions about basic services deprivations and economic growth

We find a trade-off between increasing the access to the basic services dictatorially to achieve a visible zero deprivations normative point, and remaining in the optimum of Pareto.

The inner decentralized solution is able to reach the optimum of Pareto. Moreover, since the demand of the population for the access to these services can make it to be higher than the one of the optimum of Pareto, and this can mean that the agents prefer this access over other consumption, it can be interpreted that the decentralized solution is able to cardinally reach an optimal access to these services that cannot be reached by either the social, the human or the non human planners.

As we saw, our representation also allowed us to capture implications between poverty and the lack of natural resources, i.e. we showed how a possible lack of natural resources reducing the access to these services[1] affects negatively the total production of the region, looking ahead at the limited resources exploitation possibility and at its causes, interestingly shapes the so determined design of public policy Taxes.

Steckel et al. (2017) say that their empirical analysis "should best be regarded as a first step toward identifying trends and drivers of infrastructure access." p. 116 upon which we have therefore built, in turn confirms how Dow (2004) mentions as char-

[1] Such that more investments Are necessary to keep the availability of the basic services.

acteristics of Postkeynesianism "that theory was highlighted first, and then empirical characteristics of the economy and methodology (nowadays the order would tend to be reversed)." p. 473

As it makes sense, we feasibly highlight the importance of the technological constraint by showing how for low enough production levels, an autonomous big push to erase the basic services deprivations is not possible.

Although the access to the basic services has a parametric impact, there is not endogenous growth, what answers how for economies under stagnation[2], thus the governments could claim a Pareto if, decide to increase the availability of these services, and thus, the basic services depravations given by the absence of basic capital have remained or decreased at a slow pace.

From the technology, we know that so an increase of the proportion of the population without this access, shows such rule of thumb evident relationship with the impact given by technological improvements, thus causing say verifiable stagnation of the *per capita* income.

So long we conclude fairly accounting the importance of any programs or policies which thus, improve the productivity of the households in principle without the availability of these constantly profitable services, to enhance their demand for them, where even if addressing the basic capital investments just needs to be ordered by the inside population, a possible relationship between what the social choice defines as a Pareto unanimity[3], that could lie behind the basic capital property, becomes clear when considering the studied impact and certain enriching lifestyle, thus verifiable con-

[2]Naturally representing these regions as showing the steady state with thus constant parameters.
[3]See subsection 3.3.3

sequences, for perhaps independently of the natural just agreed *per capita* income levels, it (the determinant element to which we refer) becomes reliable only if necessarily expanding our impact analysis to a broader government concept. .

4.2 Conclusions about public expenditures and economic growth

4.2.1 Conclusions about excludable public services which are publicly provided

We considered how the public provisions addd labor productivity when are accessed by the individuals, and how, there is a maximum provision of these kind of services per person stimulating the total production, because, giving more than certain quantity of vaccines of the same kind at the same moment per person would not improve their productivity .

Since the set of these public services, and the proportions of its potentialreceptors can be different for distinct economies, the optimal *per capita* provision with the maximum parametric impact can be visibly reached at different income levels. However, the government providing consumption won't make the optimal tax rate higher than the productivity of public services as in Park and Philoppopoulos (2002) models, so what they call a special case shouldn't seem so special for us.

The decentralized solution can reach the optimum of Pareto. Tax public provisions together with the capital investments do not cause endogenous growth, and thus, whether an economy reaches the provision with the maximum parametric impact or not depend on the technological level. Moreover, we fairly find that an autonomous big push to provide the level of these publics services with the maximum parametric impact, can be unfeasible for, high enough fairly accounted income levels.

Due to this, claims such as "Reducing government debt with the help of a" one shot

"capital tax increase may lead to overall welfare gains if the amount by which debt is reduced is fairly small. Otherwise, a very high tax is needed which expropriates" those asset owners, "reduces the total capital stock and also total output and the income of the wealth-poor." are analogous to our big push impossibilities in the same way that freedom impossibility[4] is to the Pareto unanimity conception.

In this direction, part or all of these public provisions can be given with the objective of releaving the other depravations which can be considered in the zero deprivations normative point of thefirst chapter and thus, we again find that there can be a living trade-off between increasing these provisions to achieve such important normative point and remaining in the optimum of Pareto, where *sadly*, the total covering could be exhaustively unfeasible[5].

4.2.2 Conclusions about public investments and economic growth

Our limit model driven representation is different from the congestion model of Barro and Sala-i-Martin (1992) only because we represent how , these governmental expenditures have an optimal positive parametric impact on the technology of the firms before the access to the complete considered set of public services is reached, where only the ratio of the public services and the total output which keeps a parametric impact could vary with economic growth thus according to the wave shape of the plausible population. Moreover, in comparison as a first aid to our large numbers model we can, fairly consider a one economy with initial levels where the limit of the parametric impact is present, and to turn off the fire, since right, it could at most be kept for

[4] I first listened to this way of refeering to the pareto unanimity while talking to Professor Luis Sánchez Mier of the University of Guanajuato, Mexico.

[5] Which is Progressively dissapointing.

a given technological level[6], then in closeness of these "Aires" , the optimal constant share of the incentive on the total production claimed in the congestion model of Barro and Sala-i-Martin (1992, as cited in Barro and Sala-i-Martin, 2004) is a particular case of our representation, only with the steady technological slight difference that we do get to distinct available, fair results under lump sum taxes.

Answering to that need, our model gets as part of the very services naturally filled capability, that the decentralized solution is able to fully reach the optimum of Pareto. We find that, although the services *like* courts of law took a parametric impact in the technology of the firms, there is not endogenous growth, which lonely means that whether the optimal public investments which give access to all the non excludable and the excludable public services is reached or not, depends on the technological level!

When even the limit of this parametric impact is present, could just increase only with technological changes that closely allow for public services, which would have caused a numbers new parametric impact, and the pride of Johan Heinrich Von Thünen[7], where still thus the life of roads extra capacity as represented in our model, issues an essentially neutral technological role independently of the *unlike*ly, "free disposal" of available technology e.g. a fair lump sum or user fee to abort congestion..

In turn we have shown an endogenous change on the participation of capital along our transition dynamics, and the neoclassical tradition is still the dominant fast model and thus best choice to represent the governmental and other shares impacts in question.

[6] As Wicksell was to say, ""Chance" is never, of course, completely, irregular, and the truth of the so called "Law of Large Numbers" can be verified under the most diverse conditions." (p. 57, 1898)

[7] Like preceded by expected value thus away from Coasian bargainings.

4.3 Conclusions about the social patterns **and** the total production

Our approach gave us an intuition about how for given labor productivities of the individuals, the social patterns can inhibit a region from producing a fa*irly defined normatively efficient outcome.

More specifically, we find that different social norms which could catastrophically affect the firms' selection of labor in general, *like* discrimination patterns or the influence of endogenous wealthy groups such as elites, have an impact on its technology, and thus, in those "Aires", on the productivity of a region.

The absence of capital has characterized certain historical episode: "Hans Neisser, Frederik Zeuthen, Heinrich von Stackelberg, Kurt Schlesinger, and Abraham Wald, who, between 1932 and 1936, discuss the existence of solutions to the general equilibrium equations, also limit themselves to the non-capitalistic model, and Wald, for example, admits that the model does not deal with capital and interest." (Petri, 2014, p. 16). However, it would be stupid to say that our developments enter some similar modelling fashion, for we neither require equilibrium, nor would our modelling be able to operate without capital, for wealth very much determines membership value, which in turn has a direct effect on distribution and thus, growth.

In short, we find out that a higher labor specialization can reswitch mainly reducing the normative inefficiency which is caused by the social patterns.

We highlighted how the social patterns can even affect the productivity of a region in other ways, which means that there is a kind of technological change which is caused by changes on social patterns. This kind of technological change, as the ones represented in the previous chapters has a limit where the global normative point that concerns all

considered aspects is reached. This thus means that if there was a region without any of the social patterns which affect negatively the productivity, then this kind of technological change would have full access to the limit. Among the fairly considered aspects we find the patterns for hiring as mentioned, as general s participation for governmental structures, discrimination of individuals to participate in the governmental decisions, insecurity, exclusion of agents to access public provisions such as education, in formal entry barriers for competition, etc. Moreover, whether this limit is reached or not depends on always allowed cardinal decisions that we name mécaniques.

Louder and thus better, we remark how there are public and private actions which have meaningful influences on the opinion and behavior of the population in relation to the considered aspects, where looking for informing and educating the individuals, inviting them to think about their actions, would derive in a kind of technological switch. Furthermore, **we must** highlight the importance of creative responsibility issue, in the sense that characters *like Dr Strange,* or Yoda from Star Wars© influencing future generations, impact or sustain part of the productivity of a region[8]. "Together with Ollman's (1991) study of alienation, Hymer's (1970) notion that multinational comparisons spatially separate the locus of production from administration, and Buraway's (1979) exploration of the ways in which workers create meaning for themselves while performing alienating work, "labor process" studies helped to create space for Marxist analysis." Pietrykowski (p. 483, 2003)

We as Akerlof consider reciprocity, fairness, and adherence to group norms. The "mécaniques" are nothing but the embedded in the distances from the limit space car-

[8] Yoda is a green, short, and very respected old individual, who acts showing incredible wisdom and strength.

dinalities' rules on economic decision making (for they require previous training) which, are to **reduce** to the spirit that: No one removes a basic instinct by aquiring a trainning; some might partially f*oo*l it though. So it is not a tool and these patterns' changes are to fairly be addressed in the aggregates, ideally through experiments' calibrations of the field of neuroeconomics, however by looking at the agents embedded in society as remarked in Lorenz and Montague (2008).

One implication of the group's matching subsect. is that lower profiles might be responsible for the productivity associated or tributed to better paid job positions.

Not only does our conception misses requiring general equilibrium, but as well it finds a trade-off between getting to such groups' common requirement and moving ahead to the limit, rendering its existence as rather irrelevant.

As we can see, *o*ur Mécanique implie a whole core of compatible microeconomic allignments beyond usual groups'skills promotion, as well as the end of the *virement giro* of standards of the mainstream economics whose order and priorities still as we previously saw, not to be trusted.[9]

4.4 General conclusions

Different thoughts getting to a limit can be found, such as David Ricardo's prophecy on land owners wealth accumulation leading to the limit with an income redistribution tax, or Marx rewriting this thus leading to a socialist limit (see Piketty, 2015), which makes our thesis nothing but just a particular on Marxist economics epistemology development (a single yearning-side mécanique, so]. Away from the usual complete risk-

[9] One example is provided by some past fair definition of Economic Depression, which can be appreciated in the following: "What has fallen is the rate of interest on liquid capital and the thing that is usually termed entrepreneur profit, i.e. the *surplus* profit, over and avobe the remuneration for services rendered, which accrues to the entrepreneurs at times of prosperity." Knut Wicksell (p.195, 1898)

incontractible excuse to enslave, Take as an $n+1$ example how as Pietrykowski (2003) writes, "Proponents of the SSA ["social structure accumulations"] approach attended –albeit incompletely (Albeda and Tilly, 1994) – to the way in which gender and race were used by employers to reproduce power and privilege." p. 484

Albeit that provided the findings of Röhrs and Winter (2014), that[10] "higher levels of public debt decrease capital." p. 14 making our approach as well fully consistent with their long run positive welfare effect coming from a decreasing debt/gdp ratios finding, Paralell to Tavani and Zamparelli (2016),[11] when it comes to debt, we must fairly conclude that: Studying growth *is not enough* to grasp Insights on debt limits and dynamics![12]

From a generation of mainstream clerks we have fairly taken in direct concerns that can be found in works such as the one of Knut Wicksell (1898) that "Many people, in fact the over whelming majority of people, are so poor that they have little or no facilities for obtaining credit." and at this cost he adds "–an evil which can be alleviated by no system of credit; only a general improvement in economic welfare can make a difference."

Since basically whether an economy under stagnation, took us to reach or not the limit of these nice model parametric impacts depends on the technological level. This conveniently for all generatIons, thus in principle allows us to provide a more complete answer to the question of the first chapter[13] because we can consider the impact of the

[10] In an investigation on public debt in the presence of inequality, undertaked by Sigrid Röhrs from a German University financed by the Zurich University, and by Christoph Winter from a Swiss University and founded by the European Research Council.

[11] They conclude that "More work needs to be done to address the dynamic effects of government speding, and incorporate the role of public deficits and debt, to increase the relevance of the framework.

[12] Though leaving empty such gap, on the limits of non-distorting taxes we can fairly recall "It may be the loss of fiscal credibility, not the maintenance of low unemployment, which is the cause of hyperinflation." Akerlof (p. 377, 2001)

[13] About why not to increase the access to the always with public participation and well defined basic

access to all the public services as well, which takes us to claim in reverse the obvious importance of the technology over economic growth.

We have represented in our driven model how, the roles of the government roads (regulated veins) is important on economic growth, for his investments and provisions opportune to, complement the total production of the economy, which means that, she has serious limitations to keep within mind concerns as the non-regulated or decentralized decisions that in the words of Ramsey (1928) look for getting the instantaneous bliss, which together with a technological constraint, as a whole constitutes the mainstream capabilities.

Living in the model, To do the representations of the first two chapters we have developed an LPC model which even allowed us only to represent how the people access to specific factors can impact the technology of the firms, where if there are factors which start being accessed privately, then the different impact on the productivity of the implied public expenditures would become more limited. In that order, this model essentially allowed us to understand that the due to policy difference solutions between the popularly well cardinalized growth stages namely developing and that will develop no more countries (i.e. now relatively backward in contrast to hasty ones), become fairly equal only under certain circumstances concerning certain participations in the equations i.e. *unlike* the equilibrium condition the optimal ratio of Pareto is thus always acquired in the governmental limit therefore superior by a nation according to her general versions of the technology[14] (According to the until the second chapter provisions, before it disappearing in the limit, the Pareto optimality is basically never

services to grow.

[14]For example it could count or not with elements such as a watermill.

achieved by a non-human planner, for it would bias toward a lower participation while a human one would implement a ruling-out participation namely ω (Insights on the implied ranking can be found at the "Tequila Shot" subsect and the Appendixes H,A)). Evenmore, among our important results we thus find that: in principle, we get Endogenous change(s) on the participation of the capital in the total production, which is consistent with transitional economic growth data tests and thus with growth commandments, and second, Behavioral contradicting effects of social classes of capital over the impact of labor inflows on the economic growth through expanding inclusion business tendency prosperity, where although unmentioned, in addition we should consider that nominal outflows would be equivalent to contractionary monetary policies, for the closed economy[15].

By inducing beyond semantics of a Kuhn-loss (see Bird, 2018) recession-depression fashion what should geometrically look *like* neural networks after the second chapter, the possible conclusion that remains from including these minorities-majorities discrimination schema, is that we are finally able to abort the inconceivable prolife posture over neoclassical built-upon models, rather introducing the matching theorem 21, together with some deck of "mécaniques" that relate to utility in some fashion that fairly pursues the ultimate true economics goal, that meaningfully goes beyond the usual faiths' wars terms involving whether either inflation and unemployment or economic growth, are thus the general equilibrium of what under some corresponding spirit is to be studied (see Case and Fair, 1997). Concerns, which would see our conceptions as rather immaterial, thus not caring about these dissapearing or not, for as for good intentions, the

[15] From which a fair effect can be grasped; A theoretical assesment on monetary policy, unemployment and growth can be found in Rosas Martínez (2016b, 2016c), where collisions of technological elements are introduced as a modelling feature.

immaterial ranks with the immaterial, and whether it remains material or not is the result of rather all-powerful forces, poor absolved under Their spirit of the (triggered or not) invisible hand terrorism.

Independently of the competing sides of the two Cambridges controversy, and the way this fairly affects an conceived decreasing LPC claimed growth model, when it comes specializedly, to the partial election of the initial conditions, I've been working my *brain* on a proposal titled: "On Behavioral Macroeconomics: Endogenous Growth, the Composition of the Technological Level And The great Divergence", where an automatic conclusion is given by the fact that how the discovering of *another* technological element or factor, in reverse takes us closer necessarily in exact forecast to the unique production function spirit extreeme "la llorona"-free; in this thesis, though taking until the second chapter just some arbitrary start, after the exploiting the would shoot to the steady state shotgun amendment, the limit is in reverse the global novelty.

In the same manner the Bishop's rule "mécanique" is as well narrative on possibly overcoming what denounced in Pigou as it reads in Medema (2003), that "It is not sufficient to contrast the imperfect adjustments of the unffetered private enterprice with the best adjustments that economists in their studies can imagine. For we cannot expect that any public authority will attain, or will even wholeheartedly seek that ideal. Such authorities are liable a*like* to ignorance, to sectional pressure and to personal corruption by a private interest. A loud-voiced part of their constituents, if organised for votes, may easily outweight the whole. (p. 331-2)" p. 440, for sucesses are incredibly achieved, and thus of this government merit.

A principal distinction between what developed until the second chapter and the

third chapter, can always be learned by following what Harcourt and Kerr (2003) devoted in the next:

"Pasineti's insistence that we understand the principles of an institution-free system before we take into account the role of institutions and particular historical episodes." p. 351. Under this "Aires", provided that institutional economics are entirely out of our scope, the quote should be interpolated to our "mécaniques" terms, which can be done! (For example a result is that undoing completely the wealthy influential groups such as elites in turn takes to the limit of economic growth)

A governmental limitation is obvious now in the kind of technological change which we have represented in the third chapter, where even though there are centralized control variables that could influence social patterns over and across times, for now we consider that if we succeeded in endogenizing each calibratable kind of "mécanique", we would get a heartlessly complicated theory, and just an application of a fixed point theorem to this context suits better the set with cardinal individuals' decisions in respect to, *these matters*, where the private-public symbiotic participations that could influence these social patterns would not only improve the daily life style of certain individuals in the sense that would allow them to get a symmetric treatment, but would also improve the productivity of the region, permuting this in such a single regime sort out direction, where thus reaching the fixed point would meaningfully imply the dissappearance ofharmfulelitesequilibria (A common result for all chapters is that in order to grow to access and keep the limit, it is implied staying away from the equilibrium, whose remoteness as an event lies in the cardinality exposed by the Cambridge capital controversy inclusion and the geometries at the second and third chapters respectively).

Therefore *thus*, from this we can exclusively remark how the real business cycles, show a great. dependence.

Even in the third chapter we frame behaviour that is to establish bricks referenced in the "mécanique" which thus escapes claiming certain questions on collective decisions such as whether this is simply a reflection of democratic processes at work, or whether such processes in themselves are a separate source of *happiness*.

Essentially, *governing* during the thesis we constantly dealt with the concept of productivity, which is, why, regardless the obvious importance of the decisions belongingto individuals, we in general remark the relevance of possible, public or private. despite tendency, development programs or policies that could fairly stimulate positively the productivity of the households[16], allowing them to improve their life styles and thus standards, where a claimable possible extension of this work would be given by the endogenization of the dynamics of the mécanique, for further research is required if we are to see *what's up* with say, the shape of the limit in question, where the presence of say an two origins line edge in time would result of *outstandingly* high generational *relevance* for the otherwise implied *angry* praxis.

As we have exhaustively mentioned, the technological improvements that we have studied take to the just employed limit[17], simultaneously, in the horizon we Thus finally recognize the essential importance of the u*n*ique and fair, Kinds of technological change where for example including what as found by Tavani and Zamparelli (2017) by following Romer (1990) "economic policy aimed at increasing the number of scientists has permanent growth effects." p. 1276, where prominent concepts such as innova

[16] Such as the Sustainable Development Goals (SDGS) of the UN.

[17] An opportunity To check how the specific composition of the limit might fairly look like, keepps an evident contrast with Braithwaite and Wenzel (2008, section 13.3) at first paragraph, possible implied Hotelling differentiation.

tion are grasped, though they are mistaken, for in reverse accessing the very technical expression of this R&D value shouldn't be Π/r , and the discounted value of profit flow at the market interest rate is mandatorily provided by $\Pi/(\pi - r)$ where π is the rate of profit under perfect competition, which in turn locally affects the workers normally imposed values. Moreover, the imposed researchers tradition to theoretically bound growth by the actives transversality-continuous condition equal **to zero**, is not part of the previous Tavanni and Zamparelli (2017) issue, that instead as well relies purely on some orthodox balanced growth path (BGP) *status quo*.

4.4.1 $_{*}\sharp$*Growth and* Income Inequality$_{*}$

An important contribution of this work is that we find possible relations between wealth inequality and the total production.[18]

An increase of the proportion of the population with low incomes increasing the proportion of individuals who do not order the availability of the access to the excludable public services[19], thus increasing the proportion of the *per*sons who need excludable and publicly provided services to maintain the average labor productivity, *ceteris paribus*, non-conditionally this would be fairly reflected in a lower average labor productivity and thus, in a decrease of even *per capita* production of the region, with constant *viral-nostalgy* thus toward the previously reached known limit[20]. In reverse, though it sounds

[18] Though we weren't really able to compare our results to the data of the introduction, for a careful review on it became necessary to thrust it as truly representing wealth, including how Brazil and Mexico are both countries (geometries) where one could get killed for her clock (e.g. as attended in Elgar and Aitken, 2010). Where having in turn that group of calibration skills promotion consideration in mind should provide us some context to. understand the following

[19] As found in Steckel et al. (2017) "Countries with lower income inequality tend to provide a larger share of the population with access." p. 116 which might have been basically caused by either some greater ω (in the fashion of Chapter 1), or as Steckel and his coauthors put it "it may reflect economic capacities, whereby more equal societies have more people with the ability to afford access." p. 116

[20] Sanchez-Perez and Rosas-Martínez (2012) find the quantitative participation of the opportunity inequality and of the individual responsibilities on the total income inequality measured with the Atkinson (see Atkinson, 1988) index at the limit, using the central concept of the cooperative game theory, Shapley value, which apparently can as well satisfy other axioms

as a fair claim, definitions such as the popular one in growth modelling of cutting edge paths shed no light on "mécanique" fixing policy, for they consider laziness (in space) as an independent variable which is of high gravity, and thus, are not even able to catch a glimpse of how generating surrounding black holes can turn another black hole into laziness and space expansion; a meaningfully broader scenario for the getting to the limit quest (we can painlessly think how laziness to realize implications is not certainly a novel, but, so it explains quite in which direction the Hayekian (in honor to Hayek) information vector may evolve).

Moreover, can we have the opportunity to fully appreciate in a moment this inpact, for example in how although it takes time to focus away from the gravitational wave of the mainstream club view of economics (e.g. Neoclassical vs Neokeynesian), considerhow a famine would make seductively necessary public provisions in order to maintain the labor productivity of the individuals, because not giving such provisions would be posteriorly reflected in the available prices and total production due to the damaged health of the people, and provided an *u*nfeasibility claim, a continuous worsening of the agents' health bumps would keep disappointingly, thus increasing the provisions which are necessary to maintain the labor productivity.[21]

Technologically independent of that, another engineered evil device, one causing some important to open relationship spirit, comes from the influential materialistic elites, with more wealthy-defined employees occupying better job position opportunities[22], than more productive agents (i.e. talented), which would secondly be fairly

(e.g. de Clippel, 2016) [and that is *o*f non-rival constant applicability, broadly always foranypresumedtechnology thatisarguedto

[21] Ravallion (1992) does a review that contemplates a deep analysis of the public polity that should fight hunger. Moreover, when it comes to contagions "Prevention researchers recognize that fairness and justice entitle all persons to benefit from the contributions of prevention science." Biglan et. al (2011)

[22] That thereby optimally pay more.

reflected in growth, with the Help of certain capabilities of the region. Moreover, so discrimination of a binary aspect involving a minimum level of *wealth*, that represents a kind of attractive socioeconomic class discrimination, this would contribute, to keep the total production from the normatively efficient, where **the** un.avoidable pestilence of infertemporal sustainability of **deterministic harmful-gaps** behaviour becomes the evident core outsider .[23]

Provided this of many years work on the *HOnne* and *Tatemae* singularity of economics[24], formally one complements soberly the single elders vision of sociopolitic and economic mechanisms contained in the negative relation between income inequality and economic growth, which is induced in Kuznets (1955), taking to Ros (2000) and Ostry et al. (2014), *like*, how an increasednew poverty would increase security redistributive preasures, thus impacting incentives to invest. That is, in principle, if high enough, despite the evident effect on say their productive equivalent-units of redistributions in the sumed technology.

Finally, under the eliminate all asperity objective, let us equalize players (central ones) by the talented mechanism that non-human and human planners were aligned. By doing that we do not destroy the visible results about the optimal of Pareto and its trade-off with increasing the access to the basic services, or through some public provisions enhancing, for they are visible marginal products policy implications which are directly related non-conditionally to the goals of reducing poverty or achieving a zero deprivations normative point, because rightly permutingly accessing these services improve directly the quality life style of the individuals and has an impact on the labor

[23] Have Other Poverty traps formation and stability been Economicall adressed in Galor and Zeira (1993), Accinelli et al. (2007) and among others Bowles (2006) and Sanchez Carrera (2012).

[24] I first learned on my personal space from strict *Honne* to *Tatemae* in that direction freely watching Nekojitablog (2018).

productivity! So where the government fully looking at therepresentative agent means that it aims the specifi dart contemplating ★equally the population as the representativeand thus average agent[25], and still, *as we ideally manifested*, erasing the implied deprivations in an autonomous way could thus be unfeasible.

Independently of possible extra capability or capacity (concept that together with congestion origins the famously valued bottlenecks term, which in that direction is as well related to cascades), con*cer*ning the Behavioral Macroeconomics branch, the private - public thus symbiotic participations that could singularly influence these social patterns would essentially not only improve the daily life style of the individuals in the sense that would allow them to get an symmetric treatment, but would thus even be better due to improving the productivity of the region.[26]

I HOpe to have introduced a long lasting spirit in contrasts to certain early Post Keynesian concern with growth and distribution (Rent distribution is in principle, the gist of the economics study; from it derives the study of economic growth, spirit which in reverse we in here address), strand of thought that according to Ramadan and Samuels (1996 as cited in Dow, 2003) was central to the first Post Keynesian period, later abandoned due to out of Cambridge Post Keynesian concerns namely uncertainty, expectations and liquidity preference. As with my courses on economics I would rather provide as a closure the need for further developments on the already addressed framework of Behavioral Macroeconomics, which focuses just on mécaniques that therefore left Institutional Economics entirely out of our scope.[27] For a long lasting standing

[25] A vision with distortion would derive in. disequilibrium

[26] Where our proposed measure of product (the distance from the limit that thus eliminates compulsive accumulations(hoardings)), fairly showing *scale effects or not*, depends on the *rivalry degree* of this parameter, which in turn, *in comparison* ideally *proportional* indicates, thus in *totals* a region's *percapita* geometry or geography in a "la llorona" free fashion as a global-regions meritful evaluation issue.

[27] This (our) frame in turn can rather be labeled as "Hydraulic Keynesianism" (see Coddington as

position is what we have conceived, at our entirely ergodic watermill concerning the limit, which prevented us from a Case and Fair (1997) approach that dictates transmitting all reward to a single fashioned remote **and** outcast intuition acceptance , that both (the *rival*) **mainstream long run** and keynesian economics (in the short run) are to simultaneously develop; an *in comparison* **entirely** cruel and schizophrenic view. So we basically formally overcome the deal of Akerlof. certainly

Thanks to the lessons of Fabio Petri on production and prices, one of the in principle attempts of my research was to formalize the existence of a non depending on initial conditions poverty trap[28], idea which although I had basically disclaimed during most of my Ph.D development, I parted aside by finally conceiving it along with the limit[29] during this whole thesis, in which I hope the reader to in principles find a just meaningful whole contribution[30]。

"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

cited in Dow, 2003), that in turn, entirely dismisses just falling short| mistaken super structures impositions such as Behavioral Economics or the one of Keller (1983) about the completion of a synthesis between Keynesian and Institutional Economics, that provided how "Gruchy in 1950 believed could "very well turn out to be the major contribution of this century" [Gruchy 1950, p. 126] —may eventuate if post Keynesians accept or develop a social value theory compatible and complementary with neoinstitutionalism." (p. 1093). Though there is still hope for some in the Behavioral Economics field developments, for one can work interpolations to finally embed them in the distances from the limit space, rather than at their as implied; irrelevant institutional usual comparisons. range

[28] Poverty traps are the usual planet for some, while for others are nothing but black holes dragging anything, even light.

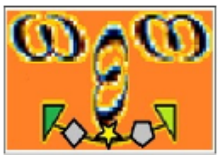
[29] Which is the common differentiation achieved by each permutable-chapter of this now entire thesis.

[30] Tabula rasa although our theory basically has implications such as the existence of the circuit (the reductionist-holistic global one), for example whether it belongs to Keynesianism or Postkeynesianism is in reverse among questions which did not yet solved. Even more, it results evident how achieving the limit implies entirely moving ahead from institutional Gödelian concerns which most beautifully put in question the universal validity of standard math, where nothing but provided how the antithesis of the antithesis is not the thesis, the iterative determination of the limit in reverse smoothly butlers the relative geometries-mécaniques space for due to crowd in-out materializations which escape the probabilistic, and whose spirits one can thus wait to bring better outcomes, thus ferociously making relevant the issued detemination in question as a whole.

macroeconomics." Romer (2012, p. 648) speaking about the competitive crisis that took place in 2008.

Of course one can steal someting from someone that never had what was stolen, but that is just not the case for this thesis. I hereby declare that this dissertation of which I hope the reader to undertake a bold reading is my own original work, and that it hasn't been published elsewere.

2,1,5,...;...;... ;N\you



Víctor Hugo

APPENDICES

In here we provide procedures and/or specify results and explanations which are fundamental for the chapters.

A. About The decentralized solution of the utility maximization in the Ramsey model

The technology is a neoclassical production function. The problem of the representative agent who can choose to invest on capital k, or consume c is the following

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

$St.$

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

$k(0) = k_0$

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

The last budget balance restriction ensuring households and firms paying their debts back is called transversality condition. Although the production function $f(k)$ could depend on other variables, in this work the households can only invest on capital, and thus, if there are other variables, are taken as exogenous parameters in a neoclassical function. The Hamiltonian of the representative agent is the following

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

The first order conditions are

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

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

By solving this system of equations we get the decentralized solution

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

Moreover, the steady state has certain saddle path which departs from the initial levels and satisfies the transversality condition.

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

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

where $p = \frac{P}{L}$ is a parametric stock, explained in the next section. κ denotes the non-human government factor undertaking, and the traditional first order conditions are:

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

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

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

so as is well known,

$$\frac{\partial J}{\partial p} = -\dot{\upsilon} \rightarrow h_p - \delta = -\frac{\dot{\upsilon}}{\upsilon}$$

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 $\frac{P}{K}$ ratio, where $\kappa = 0$ in most of the fixed rules of thumb drawing. Moreover it can be easily verified that provided that $\frac{\dot{\mu}}{\mu} = -h_p + \delta - \kappa = \frac{\dot{\upsilon}}{\upsilon} - \kappa$ it follows that

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

which means that as the results from the "Tequila Shot" sect. the decentralized solution can reach as well the optimum of pareto (for p is as usually exogenously taken, and to see a 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).

B. The model of limited parametric change

We represent how there are factors with a limited parametric impact on the measured technology of the firms. The first choice was to name it Complementarity of η-Domain (Coη-DoM) Model, though due to the presence of, certain implied activism, I instead went secondly for the now known and broadly treated training of η model, as for what now is as well known in this thesis as Limited Parametric Change (LPC) model. I guess that a propper name for the model is as well the one suggested by my

supervisor Lionello Franco Punzo: "Limiting Parametric Change model", thus mainly as well basically identified by the symmetrical right LPC acronym.

Particular applications of this model are done in the first two chapters where more fair contextual intuitions of this kind of impact can be found, and in the following we mention properties which it satisfies.

The total production is given by the equation (Eq. B.1).

$$Y = H(L, K, P) = F(L, K)g\left(\frac{P}{\eta L}\right) \qquad \text{(Eq. B.1)}$$

P is a factor with a parametric impact which satisfied $0 < P < \eta L$. For many, i.e. its impact on the total production depends on the population, denoting a kind of closed coverture per worker which improves the technology of the firms[31]. Therefore, thus the maximum level of P indicated a mean of the total populations' cover of this factor[32].

$g\left(\frac{P}{\eta L}\right)$ is a parameter which is homogeneous of degree 0 respect to L in P. This parameter openly satisfies $g_L < 0$, $g_{LL} > 0$,[33] and when $P < \eta L$, it satisfies $g_P > 0$, and $g_{PP} < 0$. Moreover, the parameter is normalized to one on the limit of its impact, such that $g(1) = 1$.[34]

$F(L, K)$ satisfies the properties of the neoclassical production function[35].

There are only two possible regimes, either the parameter is such that the marginal product of labor H_L is equal to zero when $0 < g\left(\frac{P}{\eta L}\right) < 1$, which would mean that the effective labor depends totally on the presence of P, or H_L could be positive (The

[31] How ever, there can be applications for factors which have a limited parametric impact and do not depend on the population, although such corresponding material is not considered in this very thesis.

[32] As in the application of the subsection 2.2.3 of the second chapter, P can be in function of different factors and of labor L.

[33] This appendix is devoted without contemplating whether P is in function of L, because we consider the impact rule that this factor would be part of the parameter to denote non per capita stocks.

[34] Some normizations can be done in a maximum which is not necessarily equal to the described limit, as we did it in the section 2.2.

[35] There could be more complex technological applications where, this function does not satisfy essentiality like the function proposed by Jones and Manuelli (1990), and to study the properties of the general, neoclassical production function see Barro and Sala-i-Martin (2004).

malthusian case) which would mean that an increase of the workers does not have to be complemented by further accumulation of P to increase the total product[36].

This function has decreasing marginal returns of capital and of P while $P < \eta L$, where $H_P = 0$ when will fully satisfy $P = \eta L$. Moreover, in any regime it continuously satisfies the Inada conditions of $\lim_{P \to 0} H_P = \infty$, and observable $\lim_{K \to 0} H_K = \infty$.[37]

Our context is that since, $F(L, K)$ has constant returns to scale and the parameter $g\left(\frac{P}{\eta L}\right)$ is homogeneous of degree zero, the production function $H(L, K, P)$ has also constant returns to scale and therefore, thus the *per capita* property.

Let us suppose that there is a given level of now sunk costs $P > 0$, where as in the chapters $1st$ and $2nd$, where P took a state variable or a flow form, with certain benefits for-through a population it can be. Therefore, thus given that all the firms have access to the same technology, the production of each firm j will certainly be the following given (Eq. B.2)[38]

$$Y_j = F(L_j, K_j) g\left(\frac{P}{\eta L}\right) \qquad \text{(Eq. B.2)}$$

We easily accept them not pay anything for the factor indicating the parametric effect P which affects its technology.

The market wages w are equal

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

[36] The applications of the first two chapters obey the latter case or property.

[37] Notice that we are not considering applications **like** $F(.) = AK$. We do this because, we contemplate how such applications would not have the convergence property that is found robuzt in Barro and Sala-i-Martin (2004), and further analyzed by Darlauf (2003). Instead, such specific application would need an assumption equivalent to $A > \delta$ being observed in the "Aires" in question.

[38] As in the chapters first and second some firms could need the presence of the factor P to access the technology (Eq. B.2), which would mean that at least a part of its production comes from a sort of timely defined Leontief process (see Leontief, 1953). This differentiates us from Bucci and DelBo (2011) who use a CES function, and find that for an exogenously given allocation of public capital there is a common optimal Balanced Growth rate, and that independently of the shape of the technology, the more complements are the public and the private capital, the higher the growth. They as well in contrast say that "with endogenous allocation growth in an increasing function of the elasticity of substitution between public and private capital in final input manufacturing...".

Notice that, since the parameter is in function of labor, H_L is not continuous in $P = \eta L$,[39] therefore, thus inspite the discontinuity of the function, the wages are always positive and continuous!

Again it can be verified that the capital labor ratios choosing process are such that they always do match the macro established reference k, which is better appreciated in the next determining coverage levels, uncovered-covered wages ratio.[40]

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

As they exist, we broadly look at the effect of the expenditures on growth as multiplying all the factors of production, on the equation environment (Eq. B.2) by the constant $\lambda = \frac{1}{L_j}$ to later clear Y_j, getting

$$Y_j = L_j f(k) g\left(\frac{P}{\eta L}\right)$$

Therefore, thus as always, we can aggregate all the individual productions and get the total production function (Eq. B.1).

The firms are assumed to produce under perfect competition , and therefore, the following must be satisfied

$$Y_j - wL_j - (r + \delta) K_j = 0$$

By substituting the production of each firm j, and the competitive rate at formal $r$ents of the factors, we thus get

$$\frac{F_{L_j} L_j}{F(L_j, K_j)} + \frac{F_{K_j} K_j}{F(L_j, K_j)} = 1$$

[39] Out of the Malthusian case..

[40] When it comes to this one to one relationship, Tavani and Zamparelli (2017) represent how increasing wages increases the productivity, which fairly sheds light into this phenomenon, in contrast to highly substitutable (that crowd-out eachother) though full of merit approaches to governmental participation (e.g. Barro, 1990; Barro and Sala-i-Martin 1992; Park and Philippopoulos, 2002; Afonso et al., 2014; Bucci and Del Bo, 2011; Cyrenne and Pandey, 2015; Gómez, 2016; Zang, 2015; Irmen and Kuehnel, 2008; Tavanni and Zamparelli, 2016)

$$\rightarrow g\left(\frac{P}{\eta L}\right)\left[F(L_j,K_j)-F_{L_j}L_j-F_{K_j}K_j\right]=0$$

which are mainly satisfied, because as is well known, neoclassical functions $F(L_j,K_j)$ are homogeneous, of degree 1.

A part from the always-accumulable growth factors that we took with fairness in the first and then second chapter, the model of limited parametric change can thus be applied to always-accumulable factors which are accessed in a decentralized manner, where if are purely contained in the capital or in the consumption, then $g\left(\frac{P}{\eta L}\right)$ would be an exogenous parameter depending on the decentralized decisions. Examples of these factors could be given by η representing a *per capita* minimum level of nutrition, access to communications, access to fuels, basic education, with fairness among others, for given relative prices and "with such factors being demanded privately"[41].

C. Some procedures and results from the Chapter 1

This section of the appendix concerns the procedures and results from the first chapter with the access to the basic services being given in the optimum of Pareto.

C.1 Steady consumption of the section 1.1 with $B^* < \eta L$

From the steady levels of capital and basic capital in this location and (Eq. Sys. 1.1.1), we get the steady consumption

$$c^*=[\rho+\delta(\beta-\alpha)]\left[\alpha^{\alpha}\left(\frac{1-\beta}{\eta}\right)^{1-\beta}\left(\frac{A}{\delta+\rho}\right)\right]^{\frac{1}{\beta-\alpha}}$$

which as we can see, it must be that it is positive.

[41] If public services are substituted with private services in an evident binnary way, this would therefore, thus present a limit, captured by η. This essentially means we see no differentiation in whether coasian subtitutabilities are to take place. Morecertain technological examples of relevant interest public services being substituted by privates that "do not" form part of some kind of local state, can be found in the *collective cooperative action* treated by Ostrom (1990).

C.2 Steady consumption of the section 1.1 with $B^{**} = \eta L$

When the steady state has the maximum stock of basic capital $B^{**} = \eta L$, the steady consumption is given by

$$c^{**} = \left(\frac{\rho + \delta(1-\alpha)}{\alpha}\right)\left(\frac{\alpha A}{\delta + \rho}\right)^{\frac{1}{1-\alpha}} - \delta\eta$$

c^{**} is positive, and we show this in the following.

As we have previously mentioned, for this steady state to be reached the technological level must contradict the condition (Eq. 1.1.5), and thus, the parameters satisfy

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

The condition for the steady consumption to be positive is

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

Since

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

$$\rightarrow \frac{\rho}{\delta} > \alpha - \beta$$

it must be that the positive steady consumption is .

C.3 Steady consumption with an optimal provision below η

P_0

The steady consumption from the section 1.2 when the steady state has an optimal provision below η is obtained by substituting the corresponding steady capital and the optimal ratio (Eq. 1.2.2) in $\dot{k} = 0$, and is given by

$$\alpha = \left[\frac{\rho\beta + \delta(\beta - \alpha)}{c^*}\right]\left[A\left(\frac{1-\beta}{\eta}\right)^{1-\beta}\left(\frac{\alpha}{\delta + \rho}\right)^{\beta}\right]^{\frac{1}{\beta-\alpha}}$$

which as we can it must be that c^* positive is .

C.4 Steady consumption with an optimal provision equal to η

The steady levels from the section 1.2 when the covering points are provided to all the population are the following[42].

$$k^{**} = \left(\frac{\alpha A}{\delta + \rho}\right)^{\frac{1}{1-\alpha}}$$

$$c^{**} + \eta = \left(\frac{\delta(1-\alpha)+\rho}{\alpha}\right)\left(\frac{\alpha A}{\delta + \rho}\right)^{\frac{1}{1-\alpha}}$$

It must be that c^{**} is positive and we show this in the following.

The condition for the optimal provision in the steady state to be equal to η is

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

which is the contradiction of the condition (Eq. 1.2.4), and the condition to have a positive steady consumption c^{**} is

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

Since

$$\left(\frac{1}{(1-\beta)(\delta+\rho)}\right)^{1-\alpha} > \left(\frac{1}{\delta(1-\alpha)+\rho}\right)^{1-\alpha}$$
$$\rightarrow \frac{\rho}{\delta} > \frac{\alpha-\beta}{\beta}$$

it must be that the steady consumption i.

[42] As we have previously mentioned, we distinguish these levels labeling them with **.

D. Some results and procedures from the Chapter 2

This section of the appendix contains results and procedures concerning the second chapter.

D.1 Steady consumption of the model of the subsection 2.2.2

The steady consumption when the maximum parametric impact is lower or equal to the limit, where if it is equal is reached in the steady state, is obtained by substituting the steady levels of the classes in $\dot{k} = 0$, and $\frac{\dot{G}}{L} = 0$, and by solving the resulting system of equations. Moreover, the steady consumption in such case is the following

$$c^* = \left(\frac{\delta\left(1-\alpha\right)+\rho}{\alpha}\right)\left(\frac{\alpha A}{\delta+\rho}\right)^{\frac{1}{1-\alpha}} - \delta\eta$$

We can show that this steady level is positive by following the same steps of the Appendix C.2, because we have assumed that the condition (Eq. 2.2.6) is satisfied.

When the limit of the parametric impact is reached for lower levels than the steady ones, the steady consumption is

$$c^* = \left(\frac{\delta\left(1-\alpha\right)+\rho}{\alpha}\right)\left(\frac{\alpha A}{\delta+\rho}\right)^{\frac{1}{1-\alpha}} - \delta\varphi^*$$

where φ^* is exogenously given, and on these services depends .

Appreciate that we could reject the so employed assumption about the demand for a constant output, and possibly diminish the steady consumption[43].

are to

[43] An increase on the public services would be represented with higher η or φ^*, depending on the glimpsed .

D.2 Steady consumption of the alternative representation

The steady consumption is the fellowing

$$\alpha = \left(\frac{\delta(1-\alpha)+\rho}{c^* + \delta\left(\varphi^* + \eta\right)}\right)\left(\frac{\alpha A}{\delta+\rho}\right)^{\frac{1}{1-\alpha}}$$

To allow the steady consumption to be positive we accept that the stock φ^* satisfies

$$\varphi^* > \left(\frac{\delta(1-\alpha)+\rho}{\delta\alpha}\right)\left(\frac{\alpha A}{\delta+\rho}\right)^{\frac{1}{1-\alpha}} - \eta$$

We assume this because the term in the right side of the inequality is positive, which can be verified by following the steps of the Appendix C.2, where the condition for this term to be positive is

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

As in the Appendix D.1, we can reject the assumption about a constant *per capita* public services for a constant level of income, which would affect the steady, consumption due to changed φ^* *unlike*.

E. A more detailed and contextual version of the theorem of the section 3.3

Theorem 22 *All the individuals marry accordingto the ranking of the positive labor evaluations such that each agent r_i^j gets the job position v_j.*

Proof. Due to the Gale-Shapley algorithm, we know that jobs are offered to the highest agent in the ranking, who takes the position v_1, the remaining jobs are offered, to the thoughtful second individual who formally. takes v_2, and so far and so forth until the stable person ranked last takes home in position v_n. In that order, since any profile modification of this assignation would dissapointingly not be desirable either by any-

sized firm hiring another individual, or by the worker who would be hired, thisassigntion remains. ■

> Although this ignition and thus undepreciable proof of the theorem is more symple and specialize, we prefer or consider fruitful to start from an arbitrary assination[44] as we did in the subsection 3.1.3, because this allowed us to perceive how some hiring decisions are influence by the paterns, even at such directional great cost; daily inefficiency caused and observed because of this took alternative. Moreover, this therefore reinforces the evident advantages of having clearing houses utilizing matching algorithms that put aside difficulties with obvious impacts in any context *like* exchange of live-donor kidneys for Transplantation[45].

F.

Emptiness existence a free-strategic proof

Can this be found at

ROSAS-MARTINEZ, V. (2018). Emptiness existence: A free-strategic view. Journal Of *Economics **And** Political Economy*, 5(3), 353-355. doi:http://dx.doi.org/10.1453/jepe.v5i3.1750

The $\bar{x}$ Inner Emptiness Test

As mentioned in the work, it is a matter of large numbers legislation flooding what might finally provide stability to the fixed point. In other words we are here to provide

[44] A perturbed assignation from the fixed point.
[45] See Niederle et al. (2008)

the true science of how independently of the 21 Theorem at stake, should the emptiness existence be always employed in order to enrich with stability the fixed point in question.

Let $B(\bar{x},\psi)=\bar{B}$, a ψ radio ball centered at $\bar{x}$, where ψ is just called *ergodicity ground verifier* and satisfies $\psi<k$. Therefore, this time the radio k ball of the *ith* element of the closure of $\bar{B}$, i.e. $[B(\bar{x},\psi)]_i$, would therefore in the same way be denoted by $B([B(\bar{x},\psi)]_i,k)$.

It remains nothing but to bring ourselves into the intuition that in order to endow a reached $\bar{x}$ we could go look at left and right by ψ at the space, which basically represents the distance $\psi<k$ that a region shall go through to avoid positional biased judgements until getting to some $[B(\bar{x},\psi)]_i$ before it explores up to certain distance or capacity k to check for the emptiness existence as it shall put it for the rest of the ball $B([B(\bar{x},\psi)]_i,k)$. Approaching this ball from outside, the zoom out in question T can in general be resume by coalitions as it follows $2^T=$

$\{\emptyset,B([B(\bar{x},\psi)]_1,k),B([B(\bar{x},\psi)]_2,k),...,\{B([B(\bar{x},\psi)]_1,k),B([B(\bar{x},\psi)]_2,k)\},...,\{B([B(\bar{x},\psi)]_1,k),B([B(\bar{x},$

were as it appears, the previous notation obviates intersections, for as soon as it is verified that there is emptiness within each defined ball, it remains nothing after but to get to the one conclusion that there is emptiness inside T.[46]

Only this test frame is just to obtain through some manipulation of the topology properties the allowance of instability absence verification, beyond some simple across super structures implied particular case of $yes,no,yes,no,...$ binary sequence, anchoring the sure posibility playing for the theorem 21 matching dreams, plans and so on, therefore determining smoothly what is to basically dismiss relative considerable objections

[46] Robustness can gradually be added to this test by further including this verification to imposing succesive super structures sequence of the shape $2^T,2^{2^T},2^{2^{2^T}},...$ as for the emptiness existence theorem that allows this test aplication.

in this respect.

G. Further Topology on the Limit

Definition 23 *Each individual set* $A(\{i\})$ *is additive such that* $A(\mathcal{S}) = \bigcap_{i\in\mathcal{S}} A(i)$, *where* $|A(\mathcal{S})| \lesseqgtr \sum_{i\in\mathcal{S}} |A(i)|$ *and* $\mathcal{S} \in 2^N$. *Moreover,* $A(\mathcal{S})$ *is unstable* iff $\mathcal{S} \neq N$.

Theorem 24 $\Lambda(\mathcal{S})$ *is an Alexandroff Space* iff $\mathcal{S} \neq N$, *where* $A(\mathcal{S}) \equiv \Lambda(\mathcal{S})$.

Proof. Let us conceive how provided that $A(\mathcal{S}) \subseteq \mathcal{S}$,$\Lambda(\mathcal{S}) \supseteq \mathcal{S}$ where at least the condition of the left or the one in the right are true, and further, using that by assuming all $A(\mathcal{S})$ with $\mathcal{S} \neq N$ to be closed, it follows that $A(\mathcal{S})$ being unstable implies $\mathcal{S}$ being unstable. This in turn implies that no closure of $\mathcal{S}$ holds, and thrusting this light, any change on $\mathcal{S}$ implies $\Lambda(\mathcal{S})$ to be open. So $A(\mathcal{S})$ cannot be closed, which is the definition of an Alexandroff[47] space. The in reverse causation results relatively straightforward by reswitching $A(\mathcal{S}) \equiv \Lambda(\mathcal{S})$ ■ ■

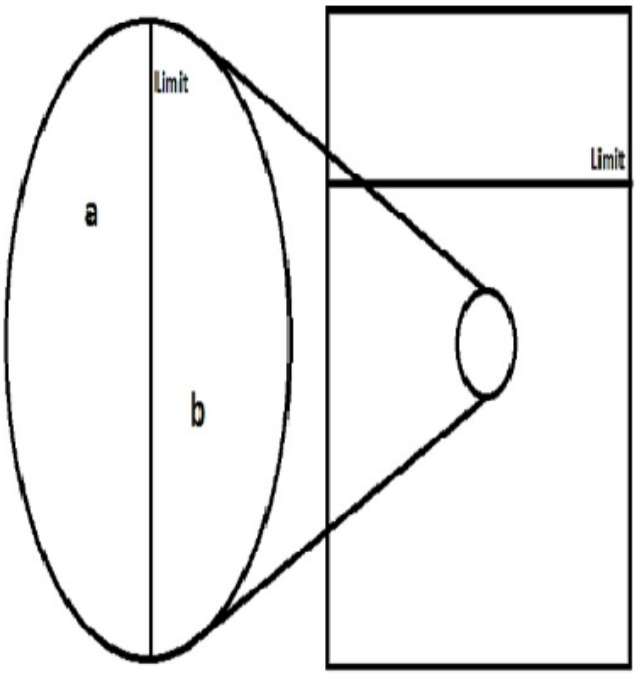
Corollary 25 $A(N)$ *is closed, and thus* $\Lambda(N)$ *is as well closed.*

Corollary 26 $A(\mathcal{S})$ *is superadditive, i.e.* $A(N)$ *makes it not to tend elsewhere but to it.*

In comparison to the previous theorem (and to the models of the second sect. of the second chapter), it results incredibly straightforward to show these corollaries from the previous, what is left to the skeptical reader *sadly.*

Figure (**??**) illustrates a limit example which is fairly my best trial of interpreting some n dimensional space[48], where we can even appreciate the *Feminamlimitus* or *Homolimitus*

[47] I learned about Alexandroff spaces by watching YouTube^{MX} (see Ciencias TV, 2020).
[48] Though it is probably more like a beer, I'm sorry I am not Yayoi Kusama.



H. Rankings and Thrumping Paths

Let us observe the following examples of "mécaniques":

The Bishop's rule. This "mécanique" develops along a chess board *like* space. This is, a piece that attempts to move from the 0 to 1 cannot do it, for it is a forbidden move. Then the only way to advance to 1 becomes the arousal of a new dimension to achieve a move to $(1,1)$ square in a (now plane). Therefore, the only feasible next advancement move becomes to the $(2,2,2)$ cube, and so far and so forth. This translates into an achievable limit at the coordinates $(\lim 1, \lim 2, \lim 3, ..., \lim \mathbf{n})$, where it is straightforward to visualize how for $\mathbf{n}$ dimensions there are $2^{\mathbf{n}-1}$ different space paths without the need of a computer (for example, one can notice there is only a white and a black path in the two dimensional traditional chess board), where under this rule the initial conditions of a piece as well as the dimensions

length are not really important.

Kaprekar's "mécanique" Consider an all resuming single dimensional calibrated to four digits path (Essentiality will imply that the four initial digits are not all the same), where all possible advancements depend on present knowledge stock, and the next step is as great as possible, such that the numbers of a present figure are rearranged to form the highest possible figure, while some political poincaré pulls the figure by subtracting to the previous figure the minimum possible figure achievable by rearranging the figure numbers. This means that, if the initial conditions were say 1234, the following state would be $4321 - 1234 = 3087$. In the same way the following state would be 8703 that as traditionally substracting 0378 equals $8703 - 0378 = 8325$. Subsequently

$$8532 - 2358 = 6174$$

$$7641 - 1467 = 6174$$

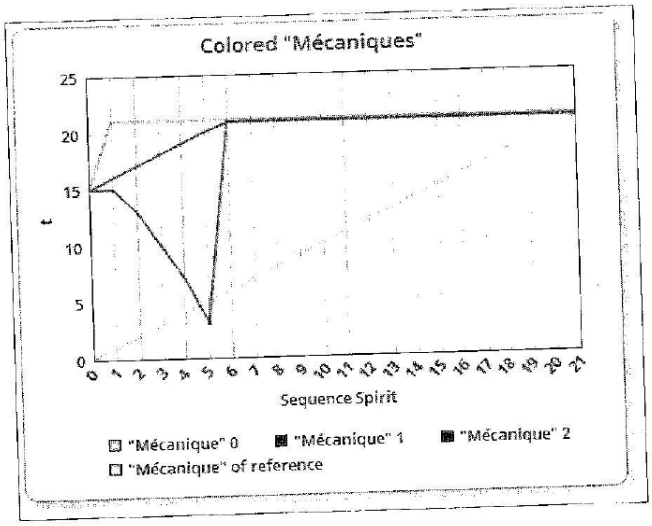
This political poincaré at stake implies the achievement of the fixed point, and has serious applications to for example, bargainings where a threat to make something even worst ensures some stability. Moreover, more accurate applications could imply certain distributive calibrations such as each unit of these figures being equivalent to say $\frac{1}{294}$ [49]

Only now will the idea about ranking paths (deciding which path "trumps" another one) toward the limit become feasible. Observe for example the **??** where by comparing

[49] It should be noticed that this "mécanique" keeps evident differences with the "Most beautiful number" experiment which according to the Behavioral Economics possesses individual's behavior explanations (see Dowling and Chin-Fang (p. 112-116, 2007)), rather indirectly justifying phenomena such as academics' earnings as naturally lower, where numbers popularity start at $49.5 + \alpha$. The differences of our approach in question are thus further clarified in the Positioning our Work subsubsection.

"Mecanique" 0 with the rest of the displayed "Mecaniques", it becomes evident how

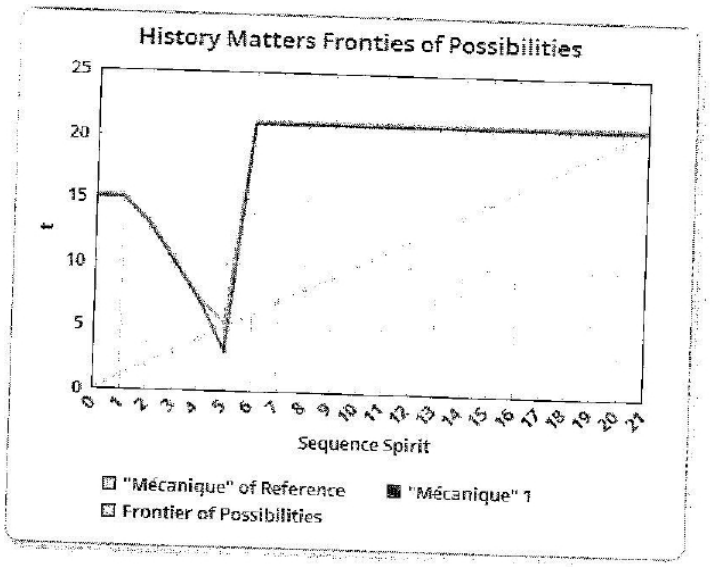
pink dominates the rest.



Major Figure

For the sake of illustration, let us take into account a comparison between purely "Mécanique" 1 (in dark) and the "Mécanique" of Reference (in yellow). By looking at the figure (??), only will yellow dominate dark in the 4-5 area of the sequence, and the opposite dominance is constantly true for the rest of the sequence. Therefore, by putting the Frontier of Possibilities *just to restore functionality* as $t_{r(X),SS} = \max t_{X,SS}$ where $t_{X,SS} = \{t_{1,SS}, t_{2,SS}, ..., t_{r,SS}\}$ and $r(X)$ indicates comparison relationship between the "mécaniques" contained in X, and SS stands purely for the entry position at Sequence Spirit. We employ the term History Matters when SS cannot be permuted. This is, in the comparison of the figure (??) pink identifies the Frontier of Possibilities, which shows some jump in the 4-5 area of the sequence, for we should be aware that an scatter

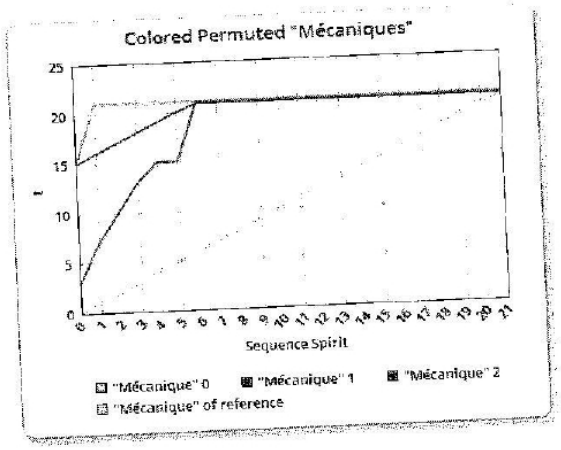
obeys discrete entries.



History front 1

As an *just avenging-vintage fashions* method we can permute the SS entries of any "mécanique" to obtain the among monotonically increasing "Mécaniques" observable dominance of figure (H.), where pink "thrumps" blue, that "thrumps" dark, which

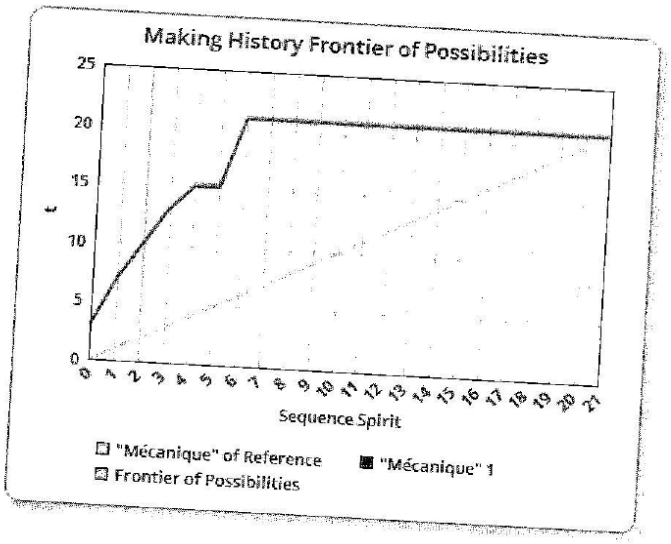
finally thrumps yellow.



Permuted 1

To allowing such permutations for "Mécaniques" comparisons, we employ for monotinically increasing SS arrangements of any "mécanique" the Term Making History, whose Frontier of Possibility of dark vs yellow is therefore appreciated in figure (H.), where

now dark dominates yellow.



History Front 2

Finally it results evident how the dominances dissagreement between History Matters and Making History come to an end i.e. are prevented or equalize without the need for eliminating asperity, if all compared "Mécaniques" are increasingly monotonic, in that sense, for this equalization opportunity in reverse yields the merit of allowing an toward the limit clear talented vs lagging behind individual "Mécaniques" distinctions as a final exam.

the reason not to provide the corollaries 26 and 25 proof, is my firm belif in that the reader can easily overcome the ones

that i conceived [employing the lattice], which in turn implies as a closure more permaNence.

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