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Can the endogenous nature of financial capitalism explain the recent dynamics for inequality?

A brief study on top-income households

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ABSTRACT

Economic inequality and asymmetric income growth has long been a fierce battleground for opposite theoretical beliefs. In a context of a post-crisis scenario, as the one we live today, it matters above all a clear assessment whether the changes in modern capitalism into a financial-led type, is responsible for widening the gap among the richest and the poorest. Setting this goal in mind, an empirical study was conducted for forty-one countries during thirty-six years accessing the inequality via the income held by top ladder households: Top One Percent (TOP1) and Top Ten Percent (TOP10).

The conclusions redrawn point for dissimilar behavioral dynamics between the incomes held by TOP1 and TOP10. Economies characterized by less reliance on global trade, higher percent of rural population, acuter educational disparities and more consumption aversion tend to generate higher returns for the TOP1 solely. Accompanying this set-up it is also noticeable two curious phenomena: firstly, the tendency of enlargement of the *ultra rich* wealth in situations oh high unemployment and lower life expectancy and secondly the non dependence of TOP1 income from the contemporaneous evolution of GDP which induces the idea of a "protective shield" in adverse economic situations for the national elites.

Key words: Income Inequality, Pedroni, TOP1, TOP10, Globalization

JEL Classification: E24, E25, I24

RESUMO

A desigualdade económica e o crescimento assimétrico do rendimento têm sido um campo de batalha feroz para teorias antagónicas. No contexto de um cenário pós-crise, como o que vivemos hoje, importa acima de tudo, um esclarecimento se as mudanças recentes no capitalismo moderno são responsáveis por aumentar a diferença entre ricos e pobres. Tendo em vista este objetivo, num estudo empírico foi conduzida a modelização da evolução da desigualdade através do rendimento dos agregados familiares superiores: top um por cento (TOP1) e top dez por cento (TOP10).

As conclusões obtidas apontam para uma dinâmica comportamental diferente entre os rendimentos do TOP1 e do TOP10: economias caracterizadas por uma menor dependência do comércio global, maior percentagem da população rural e disparidades educacionais assim como maior aversão ao consumo tendem a gerar maiores retornos para o TOP1 exclusivamente. Acompanhando esta realidade, verificam-se também dois fenómenos curiosos: primeiramente, a tendência para a ampliação da riqueza dos *ultra ricos* em situações de desemprego e menor esperança média de vida e, em segundo lugar, a não dependência do rendimento do TOP1 face à evolução contemporânea de PIB que induz a ideia de um "escudo protetor" para as elites nacionais aquando de situações económicas adversas.

Palavras-chave: Desigualdade de rendimento, Pedroni, TOP1, TOP10, Globalização

Classificação JEL: E24, E25, I24

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LIST OF ABBREVIATIONS

ADF	Augmented Dickey-Fuller
GDP	Gross Domestic Product
IMF	International Monetary Fund
IPS	Im-Pesaran-Shin
LLC	Levin-Lin-Chu
OECD	Organization for Economic Cooperation and Development
PDOLS	Pedroni Panel Dynamic Ordinary Least Squares
TOP1	Income held by Top One Percent of Richest Households
TOP10	Income held by Top Ten Percent of Richest Households

1. **INTRODUCTION**

Inequality, from the Latin *in-aequalis* stands for not equal, ie, which is different from another. Although in many countries such definition to be accompanied by a negative undertone, the true concept of inequality is so vast that can be dissected into many dimensions, some of them which falling on the scope of different social sciences. Even acknowledging that Economists are predominantly interested with the monetarily-measurable dimension of each individual income, savings or wealth patterns, that is just a simplistic perspective on the issue. A broader meaning of Inequality also includes the differences that exist in terms of skills, education, opportunities, happiness, health, social mobility and welfare. If the distribution of "*income and wealth are the two box-score numbers in the record book on people's economic position*" (Okun, 1975: 64) that happens mainly because those outcomes of income and wealth dictate the standard of living of any household. Considering that access to education, healthcare, and financial markets as well to political and legal infrastructure are unequal across modern societies, the true value of economic inequality outstrips income or wealth inequality alone. It also entails the inequality in all the dimensions that are crucial to promote the '*capabilities of people to lead the kind of lives they value – and have reason to value*' (Sen, 1997: 18).

One aspect worth an introductory note is the fact that arguing against economic inequality is not the same as defending perfect equality. There's almost an absolute consensus among mainstream (and moderate) economists that the latter concept belongs to the realm of utopias and should not be considered for practical application. Even so, academics and politicians tend to refer to the topic with extreme care. This behavior can be justified in the case of the academics with the present preponderance of *trickle down* neoliberal ideas, which are averse to regulatory authority when dealing with fiscal and redistributive policies and by the widespread belief that the individuals' income earned today, no matter how big, is the "*payoff of different levels of personal effort*" (Calhoun, 2013:34). In the case of politicians the reasons are slightly different (particularly in Anglosaxonic countries). The defense for lower levels of income inequality can be easily turned as a *political weapon*, simply because has some connotation with socialist ideas of Radical Egalitarianism and Class Warfare, which are still *taboo* concepts in many countries.

Adding the inexistence of homogeneous databases on income inequality, as fundamental support for empirical analysis, made the study orbiting economic inequality much more theoretical, scarce and disperse has it would be otherwise. Nowadays, in a post-crisis situation where some macroeconomic theories have proved to have be at same extent flaws it is important to analyze how the endogenous nature of financial capitalism is related with economic inequality, more precisely this thesis aims to discover the relationship between globalization, deindustrialization, financialization but also education disparities with the evolution of the richest TOP1 and TOP10 households of income distribution in forty-one developed and emerging countries since the 1980s until 2015. In face of such large-scale list of approaches to deal with the econometrical dimension of this work, it was selected the Pedroni's Group-Mean Panel Dynamic OLS which is particularly relevant for the treatment of macroeconomic data (reasonable number of both cross-section and time observations).

As main contributions for the Literature we found different behavioral dynamics for TOP1 and TOP10. Although the financialization process speeded-up their income enlargement, the *ultra rich* tend to be positively impacted by unemployment, higher savings rates, and educational disparities. The TOP10 is mainly benefited by higher dependence on global trade and by the deindustrialization phenomenon. Furthermore contributions also suggest that TOP1 retrieves the largest gains during booms and receives the lowest losses from recessionary periods. Stretching from the several conclusions depicted, policy recommendations targeting inequality, particularly at the highest levels seem unavoidable. Not only for assuring that the gap between the richest and poorest in modern societies does not return to those registered in pre-industrial era; but also to avoid that the natural aversion coefficient to inequality (which is inherent to any given society) can guide to larger social unrest.

Finally, the present work is organized as follows: *Section 2* collects the theoretical concepts orbiting the field of studies. In *Section 3* is presented the methodological framework, which encloses stylized facts, descriptive statistics as well as the econometrical tools used while *Section 4* addresses the analysis of the empirical results. Last but not least, section 5 concludes.

2. <u>THEORETICAL REVIEW ON ECONOMIC INEQUALITY</u>

Looking at the recent patterns of inequality, whether in income or non-income domains, we see clear proofs of steady increases of this variable, particularly in America and Europe. Evidence such as the fact that since 1975, absolute global inequality (measured by any indicator) skyrocketed with any value posterior to 2010 being much higher than any value prior to 2000 (Niño-Zarazúa *et al*, 2016) or the reality that "*US male workers have not risen median wages since 1973*" (Bordo *et al*, 2012: 4) appeal for a clarification and understanding of the controversies in terms of theories and empirical works surrounding the field.

As early as the mid-1950s, the terms in which Simon Kuznets addressed inequality are very clarifying: "*The distribution of natural product among the various groups of society is subject to acute interest*" (Kuznets, 1955: 27). The author, yet acknowledging the existence of such "*acute interest*", noticed not only the profound lack of data coverage (problem that, unfortunately, is still plagues the field), but also the minor importance given by economists to the dynamics of Income Inequality. Setting out to overcome these difficulties, Kuznets collected economically detailed and, decomposable statistics over a period of 75 years for several nations that experienced high levels of economic growth since the Late Industrial Revolution, which was by itself a major achievement in Quantitative Economic History (Syrquin, 2005). From the raw analysis of such dataset, Kuznets develops the idea that assuming income inequality as a simple byproduct of economic process is not entirely correct. For him, inequality possesses dynamics of its own and its full understanding comes up as a crucial tool to enlighten economists and policy makers.

The *founding father* of the subject, in a way to reinforce the latter idea, presented us several breakthroughs that still today are topic of research but above all disagreement (Cingano, 2014). As main representatives of this reality, we find not only what later would be known has the centripetal and centrifugal forces of income distribution (Palma, 2014) but also the Kuznets curve. Concentrating firstly upon the centripetal and centrifugal forces, Kuznets suggests that the level of income inequality is driven by the clash of two types of agents. As one kind of agents, we have those that tend to aggregate income on upper classes (unveiling a centripetal behavior) which are endogenous to the

Capitalist society of Schumpeterian type, where entrepreneurs apply scientific innovations in order to facilitate the organization of the productive process and profit maximization. Evidence for such matter comes not only from the intrinsic behavior of industrial societies with different remunerations for capital and labor but also via the chronic high concentration of savings on the wealthiest individuals, phenomenon that jeopardizes steady levels of aggregate demand.

In the opposite side of the spectrum, as another type of agents we have those that have natural tendency to disperse income across all individuals (unveiling a centrifugal behavior). The nature of this kind of agents tends to show political dimension that includes channels such as a progressive fiscal policy and the establishment of solid Keynesian Welfare State Systems at one level, that act as indirect transfers from the richest to the poorest individuals leading to a direct decrease in economic inequality. (Fogel *et al*, 2013).

Emphasizing in the moment the other major contribution, Kuznets argues the existence of an inverted U-shaped relationship, over time, between income per capita and the level of inequality: the renowned Kuznets curve. The reasoning lies through the fact that when an economy experiences a process of industrialization, urban areas become the dynamic centers that cause pressure for migration (whether internal or external). This phenomenon creates favorable conditions for an increase not only in the rural-urban inequality level but also for economic inequality amid individuals on the rural and urban areas, respectively (Galbraith, 2007). From here, Kuznets' next logical formulations are quite revealing of his own optimistic views regarding economic growth theories and provide the motive for continuous clash of ideas over the subject. According to him, from a certain point of economic progress, brought by the industrialization process, democratic and Welfare State structures emerge allowing for a continuous increase of income per capita - where widespread access to education and healthcare play a key role (Galbraith, 2007). Alongside to this fact, the economy witnesses simultaneously, a more equal distribution of income as consequence of fiscal policies. Finally, as outcome of all these dynamics, the level of inequality yields an inverted-U shape with income per capita rising continuously over time while inequality rises at one first moment but falling after that.

As in many concepts relating the study of Economics, inequality, even when only regarded as income inequality, is an extremely nonconsensual topic and battleground for opposite paradigms in the field (Forbes, 2000). The reason why this phenomenon occurs, in a theoretical level, comes from several main sources of disagreement associated to the concept itself. Firstly, the kind of relationship between GDP growth and inequality; at a second level the exact causes for inequality dynamics and last, but not least, the role of Government and particularly the most appropriate set of policies for dealing with inequality.

First of all, albeit it is unanimously accepted that economic inequality dampens the overall level of social welfare; the same cannot be said regarding efficiency. In another words, while for some economists, inequality impacts growth in a negative manner, others argue that the existence of such differences in terms of income and opportunities provide an extra boost for GDP growth. In the midst of arguments dismissing a positive link above the two concepts, we find that, for Dabla-Norris *et al.* (2015), economic inequality in addition to weakening meritocratic societies and social mobility implies, more troublingly, a suboptimal use of human capital and disruption of expenditure and saving patterns. The logic lays trough the fact that income inequality reduces the capability of less favored households to invest in physical and human capital leading to a steady decrease of aggregate demand and productivity. As side effect of this shrinking phenomenon for the economic weight of low-income households, Rajan (2010) will add a cause-effect reaction between inequality and outburst of the financial crisis of 2008. For the author, high levels of inequality and diminishing levels of available income speeded-up the leverage and the indebtment process on the American financial system which combined with deregulation and privatization policies lead to a credit boom that ultimately resulted in the Global Recession from 2008 onwards.

Another risk associated with Inequality can also be exposed in terms of the negative impact upon R&D. When considering that technologic innovations rely on a critical minimum level of domestic demand, rising income inequality decreases aggregate consumption implying by its turn a reduction on aggregate demand and fewer incentives for modernization, crippling economic growth at the long-run (Cingano, 2014). Complementing this collection of arguments, Hirschman (1973) leans to show that the vast majority of society has a strong coefficient of aversion to Inequality - if the

former is above a certain level, the author suggests that it might create conditions for social turmoil. Clinching to this last idea, Corăk (2013) presents a negative relation between inequality and social mobility, ie, higher the value of overall inequality fewer are the chances of low income individuals to improve their socioeconomical status, in a relation entitled by the academia as the "*Great Gatsby Curve*". Clare evidence for the authenticity of Hirschman's theory can be found in the 2011's outbreak of protest movement "*Occupy Wall Street!*" in the United States sparkled by the "*millennials' growing sense that the level of social inequality had become far too great and that the distribution of goods and power lacked legitimacy*" (Calhoun, 2013: 34).

In the opposite side of the economic spectrum regarding inequality dynamics, some authors counterpose that income inequality encourages (rational) agents to work harder, to invest optimally – particularly in human capital - and undertake risks making use of higher rates of return (Mirrlees, 1971). Other theoretical deduction connects to the fact that positive variations in inequality incentive savings, leading directly to an increase in capital accumulation which has positive effects on the total amount of investment via the high propensity to consume of lower/middle income households (Kaldor, 1955). Focusing on the issue from a different angle, one of main representatives of neoliberal ideology, Friedrich Hayek defends that the existence of inequality is fundamental for the economic progress because "*if today (...) the relatively poor can have a car, (...) this was made possible because in the past, others with larger incomes were able to spend on what was then a luxury. The range of what will be tried and later developed (...) is greatly extended by the unequal distribution of present benefits.*" (Hayek, 1960: 98-99).

If regarding the relationship between economic growth and inequality the theoretical stands were only two, in what concerns the fundamental driving forces behind income and economic inequality – predominantly over the last 50 years - there is a true myriad of different hypothesis. The causes appointed for economic inequality are so vast that even overflow what can be referred as the "realm of the Economic Science". Although the philosophic considerations by Rousseau (1754) - that Mankind's departure from the "*primitive state*" into stratified civilized societies triggered all sorts of inequalities - are very interesting philosophically speaking, are not particularly useful in understanding the true culprit for inequality dynamics. In order to achieve an insightful analysis of the former, the causes why individuals are economically unequal can be

classified as exogenous or endogenous ones (Charles-Coll, 2011). Curiously, although the endogenous characteristics of the individuals, such as physical attributes, family, cultural background, IQ or underlying preferences - particularly regarding labor-leisure decisions (Sen, 1997); are seen as consensual in shaping inequality, the same cannot be said about the exogenous causes. As the latter rely upon processes that are external to individual's control, academia creates different economic theories to "fill the gap". Probably one of the exogenous factors most well-known as setting of inequality is the property of land and its exploration, particularly in an agricultural sense. Although it had great importance in the past, structural changes in modern capitalist economies made this variable considerably less important as the motion force behind inequality (at least in the developed world). Nevertheless, the French economist Thomas Piketty, which is one of the main responsible for bringing the discussion of Inequality (again) into the spotlight, has recovered some of the Ricardian ideas regarding land ownership, exposing a sympathetic perspective towards the Scarcity Principle. He argues that "*prices might rise to very high levels over many decades. This could well be enough to destabilize entire societies. The price system plays a key role in coordinating the activities of millions of individuals (...) the problem is that the price system knows neither limits nor morality*" (Piketty, 2014: 6). In other terms, if there is a steady rise in asset prices (where land property fits perfectly, for example) this will lead to an asymmetric growth in wealth and ultimately to economic inequality.

In order to justify the recent patterns of rising inequality, Ostry *et al* (2014) by departing from Kuznets' forces of dispersion and concentration, appoint as an exogenous cause to that, the role of fiscal loop-holes and *offshores*. These financial machinations, as are mainly used by top-income household, aggravate even further the problem of tax evasion and the inequality of wealth. Intertwined with the latter phenomenon, the authors also highlight the lobbyist action pressing for more suitable economic and political agendas appear to have a centripetal effect on income. Stiglitz (2012) by its turn argues that rent seeking behavior, especially in young generations, is a major impellent for the amplified income gap. In the meanwhile, Piketty (2014) apart from agreeing with the latter theory, not only supports that the real culprit of such dynamics is the financialization process of modern economies, but also claims that the cyclical behavior of inequality proves that when the growth rate of capital surpasses the growth of output the probability of widening income inequality rises.

Another aspect deemed key, by the academia gravitating economic inequality, is the role of education as motion setting for income distribution dynamics. In that framework, Goldin et Katz (2008) examine the influence of education gaps in highly technological economies as justifiers for the rise of the top one percent of the *income ladder* in the West, particularly in English speaking countries. The inherent logic is that as technological progress makes labor demand to be skill-biased towards highly educated workers that stretches the earning gap among individuals with different qualifications, thereby increasing inequality. Moving from education, one final dimension sometimes also considered as a cause for the recent patterns of inequality is the fact that the globalization's deepening, with particular reference to digital systems, make possible that: "*entrepreneurs, CEOs, entertainment stars, and financial executives have been able to leverage their talents across global markets and capture rewards that would have been unimaginable in earlier times*" (Brynjolfsson and McAfee, 2011: 30). The underlying idea is that inequality comes as the non expected price of globalization.

Returning to the "*sources of divergence*" over the topic but this time by the lens of how Government should act towards inequality, we find once again argument clashes between academics defending a minimal intervention policy by opposition to those calling for concrete measures tackling economic inequality. To illustrate why redistribution may be source of equality but also inefficiency, Okun (1975) argues upon the costs entailed by Government action, making use of the "*Leaky Bucket*" idea. This simple analogy shows that Redistribution involves leaks out of the system not only due to administrative costs, but also by diminishing incentives for work effort. As consequence of such efficiency-equality tradeoff, redistribution must be used with caution in a manner that its benefits exceed its costs. Just as caveat, Okun never defended the abolishment of redistribution because: "*Society needs to keep the market in its place*" (Okun, 1975: 13). Mankiw (2013), in exposing why redistribution may be harmful, imagines a social utopia where all individuals are equal in terms of income, labor supply and fiscal contributions. He continues by wondering that one day, an entrepreneur designs and markets a new product, which is desired by all. As consequence of this, everyone buys the good making the entrepreneur the richest person in that society. The question now posed is that: should the Government alter its policy to return to the egalitarian utopia? For the author, the answer to that is a resounding "*No*" because inequality is simply a side effect of market forces rewarding successful

entrepreneurs and venture capitalists. Yet another argument present by Mankiw (2013) has a very Paretal influence - as so far no one presented a theoretical policy to deal with Inequality that would still leave the top 1% in a better-off position, in terms of effiency the new equilibrium after any redistributive policy would not be a Pareto Optimal.

Different arguments use the authors that believe that a strong Government action does more good than harm when redistributes income and assures economic opportunities. For them, State intervention is crucial not only to guarantee stable economic growth but also social cohesion: Ostry *et al*. (2014) allege that redistribution seems benign in the vast majority of examples and only in "*extreme case there is some evidence that it may have direct negative effects on growth*" (pp. 4). Dabla-Norris *et al*. (2015) highlight that the importance of Government goes further than redistribution: a solid labor market complemented by an adequate education system is also fundamental to decrease inequality. While too flexible regulation tends to hurt low-skilled workers the most, too rigid labor markets are prone to affect capitalists and investment attraction. This reality demands a Government's fine tuning in terms of regulation which must be accompanied by an empowering of the human capital of low-income household individuals in order to potentiate their chances of access into the labor market, avoiding informality.

Given the broad and conflictual theoretical framework orbiting economic inequality, as mentioned earlier, economists and policymakers should not be surprised if the empirical results on the topic would also reflect that discrepancy. A quick overlook upon the empirical literature on the field, in which lack of data and sufficient coverage still represent major obstacles, some conflictual results array around not only the trustworthiness of the Kuznets Curve but also regarding the inexistence of a wide-ranging consensus on the sign and validity of the relationship between inequality and economic growth.Before presenting the several conclusions from the analysis of the empirical literature, one aspect that is crucial in order to properly analyze economic and income inequality it is, without a doubt, their indicators.

As regards income inequality, its quantification can be carried out by a variety of indices ranging from the simpler to more advanced ones. Representing the simplest type indicators, we find measurements such as Quintiles, Deciles and Percentile Ratios of Income Distribution – with particular emphasis upon the Palma Index (Palma, 2011)

and the 20:20 Ratio. With a quite straightforward analysis, while the Palma indicates how many times the richest 10% in a given economy earn in comparison with the poorest 40% of the nation; the 20:20 Ratio expresses the same reasoning to the 20% of individuals located in the extremes of the Lorenz Curve, which is the cumulative distribution of income at a given economy. Notwithstanding the importance of the latter, the most used index to study these dynamics is, by far, the Gini Index of Mutability (Gini, 1912). It can be found, graphically, by the ratio between the Lorenz Curve and a hypothetical inequality-free economy distribution, ie, where the Lorenz Curve is simply the 45° line. The interpretation of such index comes up as quite straightforward: closer to Gini approaches the unitary value higher the level of income inequality.

Shifting our attention at the moment to the measurement of the non-income domains of inequality two different observations can be made. While the first relates with the broader nature of the indicators: where we find not only transmutations of the popular Gini Index but also regression-based indices or even the use as descriptive statistics as proxies to access the inequality of opportunities; then the second observation entangles, as mentioned before, with the fact that constructing such indices occurs in the framework of high data scarcity and heterogeneity which at some extent influences the final results and conclusions (Voitchovsky, 2005).

Statistical data regarding different aspects of socioeconomical development and wellbeing according different income shares of population provides a quite reasonable understanding of the overall level of inequality - for example, the amount of financial borrowing granted to the different quintiles of income distribution comes up as sign of the level of Financial Inequality. The same logic can be applied to other dimensions if we consider the number of births with medical supervision or the tertiary level of education (also by income shares of population) as quintessential in setting the level of Healthcare and Education Inequality, respectively. Still assessing the inequality of opportunities over Education but now via a more elaborated way, the major indicator used is a derivation from the Gini Index, known as the Human Capital Gini (Castello et Domenech, 2002) computed using the cumulative years of schooling in a given population by different levels of education - closer to the unitary level higher the equality in Human Capital accumulation.

Having presented the main inequality indicators, it is now important to underline the several conclusions redrawn from their analysis. In what concerns the Kuznets Curve, previously explained, it is relatively fair to state that this concept set off in motion a large train of empirical research aimed at either corroborate it or dismissing it. Nonetheless, a clear outlines appears: the group of scholars that argue that inequality has a minor role impacting welfare have a propensity to uphold the Kuznets curve, and vice-versa. In this line of reasoning, Barro (1999) and Grijalva (2011) showed that the inverted U-shape relation comes up as an empirical regularity in cross-section and time series data, respectively. Despite these results, a caveat must be made for Grijalva (2012): the validity of the curve is endangered if the sample is restricted to less developed countries; ultimately putting in check the optimistic kuznetian views regarding economic growth. In a different scope are the authors that believe that there is no natural automatic adjustment on the market towards a more equal distribution of income. Palma (2010) not only dismisses this relationship, but also presents an "*Antikuznets curve*" - the endogenous characteristics of modern capitalist societies may act to incentivize inequality growth in high-income countries, and reduce the income gap in low-income countries, ie, the exact opposite of Kuznets's prediction. Palma (2010) also shows that the dynamics of income equality in particular world's sub-regions, such as Latin America and Austral Africa, totally undermine any credibility associated to the concept.

On its terms, Piketty (2014) justifies the elaboration of such relation as simply a reflex of Kuznets' *zeitgeist*. It is often overlooked that during his lifetime two major events disturbed the long-run economic trend (the Great Depression in the late 1930s and World War II in the early 1940s); which were overcome mainly by the application of policies with a Keynesian nature. Kuznets, even acknowledging the speculative nature of his work, analyzed the effects of the Golden Years (1950 – 1973) of the Capitalist World, which at the time were heavily engaged with a clash of ideologies intrinsic to the Cold War. Given this context, the optimistic claiming that natural dynamics of capitalism could assure better standard of living for all member of any society (and thereby a decrease of inequality) can be seen "*in large part,* [as] *a product of the Cold War*" (Piketty, 2014: 14). Furthermore, the new feeling among some economists is that the empirical "*evaporation*" of the Kuznets Curve implies for modern

days that "*the phony excuse used by many academics, politicians and business people in middle-income countries for their high inequality to be now outdated*" (Palma, 2014: 5)

Moving finally towards the other major branch of the empirical literature, we find a peculiar behavior described by the conclusions regarding the relationship between income inequality and economic growth. The claiming for such peculiarity comes from the fact that the studies conducted in the topic are heavily intertwined with the gathering of high quality database across the last 30 years. By other words, the publishing of new accurate data comes up as temporal thresholds for the results on the field. Moreover, according to Boushey *et al* (2014), since 1980, several "waves of results" can be portrayed: the first one from the late 1980s until the late 1990s; the second lasting from 2000 until 2010, fuelled mainly by the database gathered by Deininger and Squire (1996); and the final one from 2010 onwards sustained predominantly by the data compiled by Atkinson, Piketty and Saez (2011).

Referring to the initial "wave", Benabou (1996) showed that the vast majority of empirical studies conducted over those years, pointed out to a negative and statistically significant interaction between the two variables, ie, income inequality trumps growth. Nonetheless, to the fact that choosing control variables for econometrical regressions when dealing with economic growth to be particularly challenging (Sala-i-Martin, 1997) adds the case that those studies although "*have amassed substantial data on inequality, the information included was often of dubious quality*" (Deininger and Squire, 1996: 567). Setting to overcome this, the former authors, as referred previously, created new and more reliable statistics on inequality that shifted the paradigm for the academia. The new conclusions pointed now to a non significant interaction between income inequality and economic growth. Moreover, Barro (1999) shows little overall relation between income inequality and rates of growth and investment. According to him, although higher inequality levels tend to retard growth in poor countries encourages GPD growth in richer ones. Complementing these results, Forbes (2000) found a positive relation in short term growth and inequality for all countries.

Notwithstanding this reality, many studies conveyed after 2000, complemented with more data released in the meanwhile, began to find some "micro patterns" from the relationship between GDP growth and Income Inequality: the fact that high inequality in terms of wealth distribution and human capital were damaging to growth (Dominicis

et al, 2006), or the reality that the effect of inequality has on national growth is highly dependent on the intrinsic level of development (Banerjee *et al*, 2003); slowly started to shift the paradigm back again to a mainstream negative relation between income inequality and growth. But the economists which are the ultimate responsible for this "reshift" are, without a doubt Facundo Alvaredo and Emmanuel Saez (both from Spain), the English Tony Atkinson, and the French Thomas Piketty after the compiling of the 2011s "*World Top Income Database*" that would later transmute into the 2015s "*The World Wealth and Income Database*". Ever since, almost all the empirical literature assembled, not only pointed to a significant and negative relationship between income inequality and GDP's growth (Boushey *et al*, 2014) but also highlighted the more problematic nature of rising income concentration on the already wealthiest individuals that besets even more medium run growth spells. In allusion to this, Dabla-Norris *et al*. (2015) show an inverse relationship between the income share of top 20% and economic growth: if the income shares of the top 20% increases by 1 percentual point (pp), the GDP growth tends to decrease by 0.08 pp in the following 5 years.

One final aspect that is crucial to a better grasping of such issues entangles with the methodologies used, particularly with respect to the Econometrical estimators. By one hand models using "*the Fixed Effects or first-difference GMM* [General Method of Moments] *estimators (...) tend to indicate a positive relationship* [between inequality and GDP growth] (…) *but on the other hand, the mostly negative results are associated with Random Effects or system GMM estimators*" (Zweimüller *et al*, 2011: 22). The justification for such results, according the later authors, comes from the fact that differences-based estimators, as the Fixed Effects or first-difference GMM, as place more emphasis on the short/medium-run impact from inequality tend to point to a positive (and beneficial) relation. By the contrary, level-based estimators, as the Random Effect and system GMM, as place more emphasis on the long-run, are more likely to capture all the costs of inequality yielding a more negative (and harmful) relationship with GDP growth.

3. **METHODOLOGICAL FRAMEWORK**

3.1 Conceptual Goals

Based upon the theories presented in the Literature Review, the main goal for this master thesis lays trough the assessment whether if the structural changes in capitalism since 1980 - from an industrial-fordist to financial-lead type, might leverage an extra centripetal effect on income distribution. This analysis will be achieved by unusual perspectives: top-income households. By another words, the main focus of the analysis is to interpret what kind of nature we have between the income held by the elites and the main features of nowadays economics structures, marked by a strong globalization and financialization process and deindustrialization among the most developed countries worldwide. For the sake of better understanding, the core hypothesis test underlying this thesis is:

H_0: Structural changes in capitalism leverage a centripetal effect on top-income distribution

H_1: Structural changes in capitalism don´t leverage top-income distribution

3.2 Data

For research purposes, annual data referring to different indicators of economic and social dimensions, appertaining to forty-one countries, as described in *Table 1*, and which together represent the OECD countries and emerging economies. The countries above mentioned were mainly selected because they represent (in 2017) more than 90 percent of the world's GDP allowing for stronger and more general conclusions in what concerns economic inequality. Also matters clarification that the data was collected for a thirty-six years period spanning from 1980 until 2015.

Table 1 – Countries composing the sample

COUNTRIES					
Australia	Czech Republic	Greece	Japan	Norway	Sweden
Austria	Germany	Hungary	South Korea	New Zealand	Turkey
Belgium	Denmark	India	Lithuania	Poland	United States
Brazil	Estonia	Ireland	Luxembourg	Portugal	South Africa
Canada	Spain	Iceland	Latvia	Russia	United Kingdom
Switzerland	Finland	Israel	Mexico	Slovakia	China
Chile	France	Italy	Netherlands	Slovenia	

The dataset that was crucial in the construction of this master thesis can be subdivided in two categories of nature: one economic and other social. Referring the economic aspects we have the:

GDP growth – annual growth rate of Real Gross Domestic Product;

TOP10 – Share of the GDP owned by the richest 10% of the total households;

TOP1 – Share of the GDP owned by the richest 1% of the households;

Trade – Share of Imports and Exports represent in the GDP;

Unemployment Rate – Civilian Unemployment Rate;

Savings – Share of Total Savings in the GDP;

Industrial – Share of Industrial Output in the GDP;

Services – Share of non-agriculture and non-industrial output in the GDP.

The data for the economic variables is balanced and annually-formatted but retrieved and measured by different ways, as visible in *Table 2*. The time observation ranges annually between 1980 and 2015, providing a total of 1476 observations *per* variable.

Table 2 – Economic Variables

VARIABLE	SOURCES	MEASURE	TIME-SPAN
GDP growth	The World Bank*[1]	Percentage Points	1980-2015
Top 10 %	SWIID*[2]	Percentage Points	1980-2015
Top 1%	SWIID*[2]	Percentage Points	1980-2015
Trade	The World Bank*[1]	Percentage Points	1980-2015
Unemployment Rate	The World Bank*[1]	Points	1980-2015
Savings	The World Bank*[1]	Percentage Points	1980-2015
Industrial	The World Bank*[1]	Percentage Points	1980-2015
Services	The World Bank*[1]	Percentage Points	1980-2015

*1 - http://data.worldbank.org/
*2 - http://fsolt.org/swiid/

It is also taken in account the social dimension trough:

Education Gini – Gini Value for education inequality;

Life Expectancy – Average Life Expectancy at birth;

Rural Population – Percentage of Total Population habiting in non-urban areas;

The data for the economic variables is also balanced and annually-formatted but retrieved and measured by different ways, as visible in *Table 3*. The time observation ranges annually between 1980 and 2015, providing a total of 1476 observations *per* variable.

Table 3 – *Social Variables*

VARIABLE	SOURCES	MEASURE	TIME-FRAME
Education Gini	Ziesemer (2016)*[1]	Points - [0,1]	1980-2015
Life Expectancy	The World Bank*[2]	Years	1980-2015
Rural Population	The World Bank*[2]	Percentage Points	1980-2015

*1 – http://econpapers.repec.org/paper/unmunumer/2016044.htm
*2 - http://data.worldbank.org/

3.3 Descriptive Statistics & Stylized Facts

Now that the variables and respective sources are clarified, it matters also to conclude regarding their evolving dynamics by means of descriptive graphics and correlation coefficients. Before advancing towards the stylized factors it is quite important to shed light on the concept of absolute inequality. Absolute inequality, in opposition to the relative one, focuses on the quantitative and measurable differences of income between individuals or households (Niño-Zarazúa *et al*, 2016). As the relative measure expresses the differential ratios across individuals of different income/wealth levels, that allows for situations in where it is possible to have simultaneously a decrease in the relative level of inequality (accessed by the Gini Index) and an increase in the absolute level. More precisely that happened in East Asia and Latin America between 1985 and 2010. A different dynamic is presented by North America, Europe and Central Asia with sustained rises on income disparities, whether analyzing by absolute or relative measures as expressed in *Figure 1*.

As mentioned before, absolute inequality rose in all the regions depicted in the sample. This reality is derived mainly by the asymmetric growth of income in elites which has seen a vigorous increase over the last thirty years. Since the early-1980s the wealth held by the richest individuals in the United States and United Kingdom started revealing a very pronounced upward trend only to be halted by punctual situations of crisis. During this period the income detained by TOP 1 and TOP10 rose by 132% and 45%, respectively in the American case; and expanded by 81% and 25%, respectively in

the United Kingdom, as conveyed in *Figures 7* and *9* For Europe and Japan the accumulation of wealth in TOP1 and TOP10 has presented a different behavior: remained relatively flat from 1980 to 1990s, and increased steadily from the late-1990s until the Great Recession, even in regions where such phenomenon was not expected such as Scandinavia. Taking Germany as an example, during the last forty years the income held by the TOP1 and TOP10 increased 26% and 23%, respectively as visible in in *Figure 5*. Since the peak of the last crisis some countries have resumed once again the general centripetal force for higher income held by the ultra rich, but nowadays that evidence occurs not only for the Anglosaxonic countries but also in continental Europe and East-Asia (Piketty, 2014).

Figure 1 – *Gini Evolution by regions*

Inequality Measure	1985	1995	2000	2005	2010
East Asia & Pacific					
Gini (G)	0.557	0.679	0.509	0.582	0.514
Absolute Gini (AG)	864.861	3137.612	1689.899	3873.928	4582.664
Europe & Central Asia					
Gini (G)	0.381	0.499	0.494	0.461	0.418
Absolute Gini (AG)	5707.365	7666.690	8565.410	9143.340	8987.439
Latin America & Caribbean					
Gini (G)	0.542	0.567	0.577	0.544	0.512
Absolute Gini (AG)	4000.509	4561.950	4832.972	4912.611	5313.855
North America					
Gini (G)	0.362	0.384	0.393	0.399	0.412
Absolute Gini (AG)	10462.433	13208.108	15757.475	17312.952	17754.628

Source: Niño-Zarazúa et al, 2016

As a caveat to be made for the context of China, India and Brazil, the enlargement of the ultra-rich income, which grew for the double when considering the Chinese case (vide *Figure 3),* was also matched by the lifting of millions of people from situations of absolute poverty, fulfilling the optimistic kuznetian theory of inequality (Syrquin, 2005).

As seen in Literature Review, although the concept of what is too much inequality is yet blurry, the topic can be put in perspective. An interesting way to achieve exactly that is by comparing the wealth detained by the ten richest individuals worldwide and comparing it with the GDP of some random nations, as seen in Figure 2.

Figure 2 *- Wealth Comparisons*

	Forbes TOP10 (Dec. 2016)	Nigeria (2016)	Belgium (2016)	Norway (2016)	Portugal (2016)	Austria (2016)	South Africa (2016)	Colombia (2016)	Sierra Leone (2016)
■ Billions €	€ 486	€ 467	€ 456	€ 380	€ 265	€ 372	€ 314	€ 254	€ 47
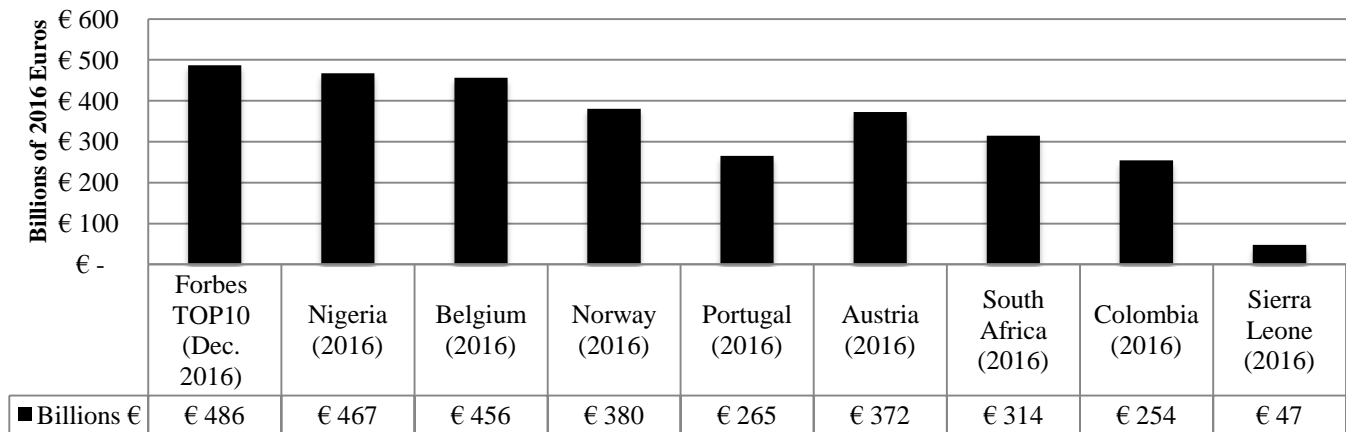
Sources: Forbes Magazine (2016) available in https://www.forbes.com/billionaires/list/; IMF (2017)

The amount of wealth detained by the 10 richest individuals worldwide is greater than some developed nations worldwide and averages ten times larger when comparing to the GDP created by the poorest developing countries. At 2016, the absolute level of income achieved new records highs when "*just 8 men own the same wealth as half the world*" (Oxfam, 2017). The current situation only founds parallelism to numbers registered in pre-World War One period.

In face of such reality of extreme uplifts in the overall disparities it is particularly appellative coincide all these evidences with other economic and social phenomena intrinsic to the last four decades: the new emerging economies, the wide spreading of globalization, deindustrialization and financialization. Although the idea for such it is not brand new (Dabla-Norris et al, 2015; Cingano, 2014), the innovative feature comes from the use from TOP1 and TOP10 deciles as proxy for the level of absolute concentration is *golden* households. From Figures *3 to 10* are expressed these evolutions regarding four different countries in the sample.
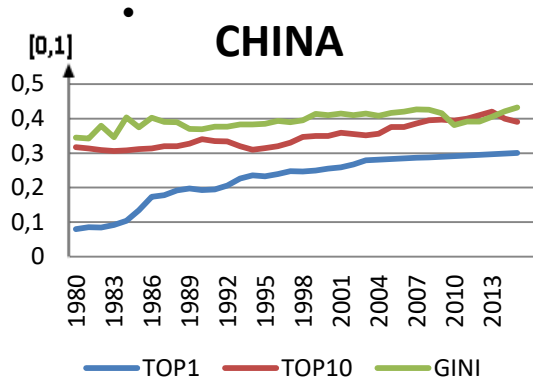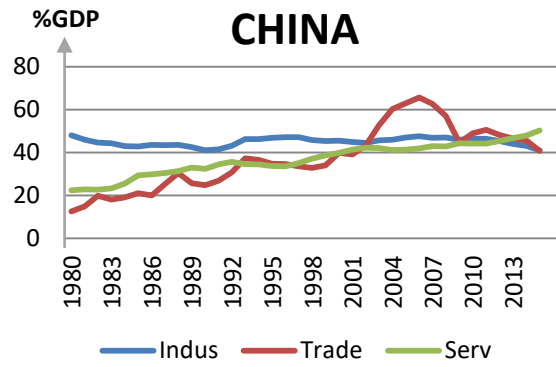
Figure 3 – Income inequality in China

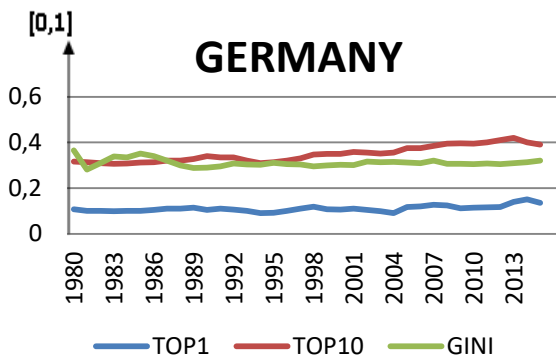*Figure 4 – China's Macroeconomic dynamics*

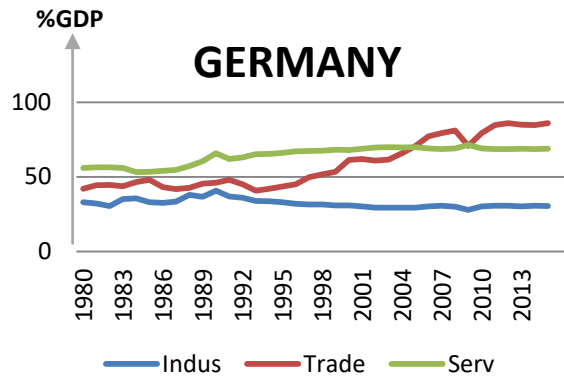
Figure 5 – Income inequality in Germany

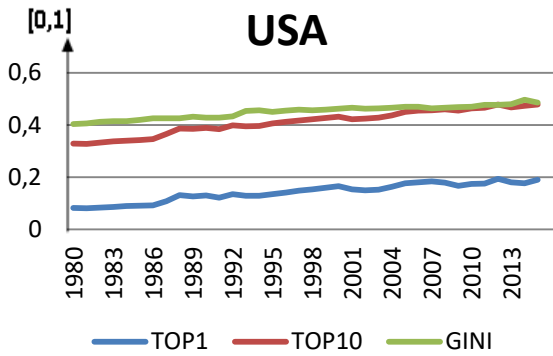*Figure 6 – Germany's Macroeconomic dynamics*

Figure 7 – Income inequality in America
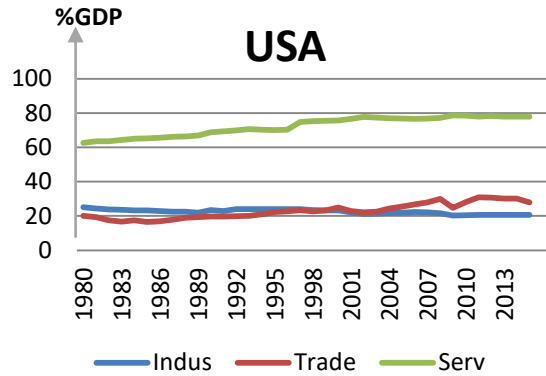
Figure 8 – America's Macroeconomic dynamics
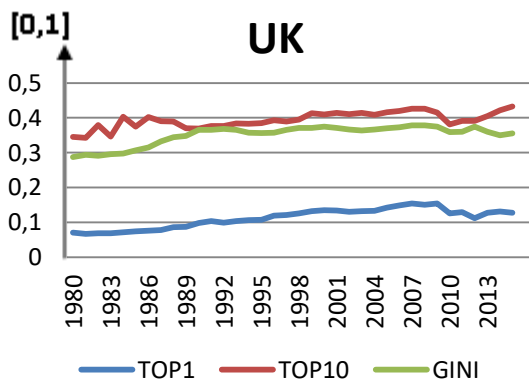
Figure 9 – Income inequality in the UK
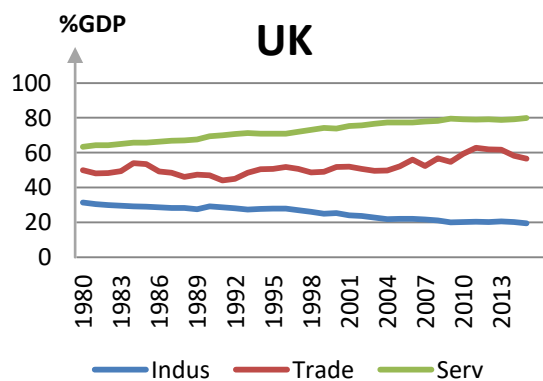
Figure 10 – British Macroeconomic dynamics

Although the macroevolution of the variables, expressed in *Figure 4, 6, 8 and 10*, to be different in terms of openness to global trade, deindustrialization and share of services in total GDP, a unique outcome is generally applicable: during this period it is palpable a centripetal force toward top-concentration, whether accessing developed or emerging countries, as figures 3, 5, 7 and 9 show.

Another analysis worth carrying out intertwines with the volatility and correlations amidst the variables considered. Conveyed in Appendix A, we witness that the volatility for TOP1 and TOP10 assumes low values of 0, 0528 and 0, 0843, respectively. When putting in comparison for the GDP growth (with a standard-deviation of 3, 3450) it is possible to say that the amount of wealth generated by top-ladder household are much stickier and have a natural tendency to be near the mean value (which for TOP1 assumed a mean of 9 % of total GDP and for TOP10 assumed a mean value of 33% of the GDP).

Moving now for the correlation analysis we witness that the several control variables used possess sometimes dissimilar impacts upon TOP1 and TOP10. This claim is supported by the information retrieved from Appendix B and expressed in *Table 4.*

Table 4 *–-Sign of the Correlation amongst Tops and Variables*

	Sign of Correlation with TOP1	**Sign of the Correlation with TOP10**
Education Gini	Positive	Positive
GDP growth	Positive	Negative
Industrial Output	Positive	Negative
Life Expectancy.	Positive	Negative
Rural Population.	Negative	Positive
Savings	Negative	Negative
Services Output	Positive	Positive
Trade	Positive	Positive
Unemployment	Positive	Negative

From the raw observation of the data it is possible to detect that GDP growth, Industrial Output, Life Expectancy and Unemployment although impacting positively the income held by the TOP1, have an opposite effect on the *not so* wealthy. With the inverse tendency appears solely the percentage of Rural Population in the economy. The rest of the variables seem to have a simultaneously equivalent impact upon the *golden*

households: Education Gini, Trade and Output in Services impelling for higher levels and Savings level as an anchor for TOP1 and TOP10 deciles.

3.4 Software

The empirical results here held were computed using Eviews7 and STATA version MP/13.0, which together perform potent statistical computation of heavy data, condensed in simple commands.

3.5 Data Processing

Given the characteristics of the dataset it is fair to observe that falls into the category of macro analysis, ie, time-series panels. Pedroni (1999) defines this field of econometrics as involving a reasonable number cross-section observations (usually, lower than 100), a considerable number of time observations (habitually higher than 20), where the parameters explain the heterogeneity across groups and the variables tend to show unit roots or nonstationarity behavior but also cross-section dependence. Although considered for great importance for the future of modern Macroeconomics, Development economics and Macro finance it is a relativity new field of studies meaning that not yet so many researchers are using such estimation tools nor the literature is yet so rich and varied. In regard to this, Eberhardt (2011) highlights that as the great majority of empirical analysis on "panel time-series" uses tools originally built to study longitudinal panels which may compromise the robustness of final results.

Following the framework provided by Neal (2014), the "order of integration between the variables" (pp. 684) is assessed trough the panel-unit root and cointegration tests. From here the estimation is next step where the values presented will express the long-run relationship between top-ladder incomes and other social and macroeconomic aggregates accounting 36 time periods among a panel of 41 countries.

3.5.1   VARIABLES (NON) STATIONARITY - PANEL UNIT ROOTS

In order to achieve a successful estimation, one crucial aspect intertwines with the knowledge that if the data presents a stationarity or a non-stationary behavior, by other words, to test if the variables have unit roots or not. Having that purpose in mind three

different statistics were used, firstly the Levin-Lin-Chu test which presuppose that every one of the countries' variables share the same autoregressive process of unitary order, better known as AR(1), but at the same time permitting individual and time effects. It matters also to refer that the statistic of interest is normally distributed under the null hypothesis of nonstationarity. The second test used was an Augmented Dickey-Fuller (ADF) Procedure where the statistic of interest is redrawn after modeling a random walk with a drift. If in that estimation the lagged variable doesn´t account for a relevant impact then the null hypothesis of no stationary cannot be proven and the panel has not unit roots. The final test, which is the most powerful of the three, is known as the Im-Pesaran-Shin (IPS) test which basically averages individual ADF statistics collected for the group observations. A descriptive p-value analysis is depicted in table X.X.

Table 5 – *Stationary Analysis in Levels*

STATIONARY ANALYSIS IN LEVELS	Levin-Lin-Chu statistic	Im, Pesaran & Chu	Augmented Dickey-Fuller
GDP growth	0,76	0,43	0,72
Education Gini	0,78	0,92	0
Life Expectancy	1	0	0
Rural Population	0*	0,97	0,99
Share of Industry	0*	0	0
Share of Services	0,33	0,42	0,22
Top 10%	0,99	0,84	0,09*
Top 1%	0,77	0,54	0,08*
Trade	0,10	0,01	0,35
Unemployment	0,01	0,00*	0,81
GROSS GINI[1]	0,32*	0,21*	0,13*

Note: ** Rejects the null at 10% significance level;** rejects the null at 5% significance level; *** rejects the null at 1% significance level.*

Given the critical values, the conclusion to be made regarding unit roots is not homogeneous. Such variables as Life Expectancy, Rural Population, Unemployment, which all the 3 tests did not rejected the null hypothesis of the presence of unit roots, indicate that the panel units are I(0), ie, series are stationary. Also worth mention the fact that these test statistics in what regards Gross Gini appointed to a stationary conclusion which induced a change in the dependent variable and by so the topic under scrutiny in this thesis. Thereby instead of focusing in the relative inequality expressed by the Gross Gini this analysis was conducted under the banner of absolute inequality conveyed in Top income earners/households.

Bearing in thought that as several variables present themselves to be I(0) that requires a careful treatment on the models in order to avoid spurious relationships, it also important to know what is the stationary behavior in first-difference values. Applying the same tests as before we can see in *Table 6*, all the variables, except Rural Population, reject the null hypothesis of nostationarity, indicating that almost all the variables are stationary in first differences, ie, are I(1).

Table 6 – Stationary Analysis in First Differences

STATIONARY ANALYSIS IN FIRST DIFFERENCES	Levin-Lin-Chu statistic	Im, Pesaran & Chu	Augmented Dickey-Fuller
GDP growth	0	0	0
Education Gini	0	0	0
Life Expectancy	0	0	0
Rural Population	0,99*	0,62*	0,22*
Share of Industry	0	0	0
Share of Services	0	0	0
Top 10%	0	0	0
Top 1%	0	0	0
Trade	0	0	0
Unemployment	0	0	0

Note: * *Rejects the null at 10% significance level;** rejects the null at 5% significance level; *** rejects the null at 1% significance level.*

3.5.2 - PANEL COINTEGRATION

Once carried on the stationary analysis in levels and first-differences we must scrutinize the relations of cointegration amongst the variables that shown to be I(1). As depicted in Neal (2014) one of the best approaches to evaluate the cointegration relationships amidst the covariates lays trough the outline constructed by Pedroni (1999, 2004). This tool assumes heterogeneity across the panel "*both in short-run dynamics as well as in the long-run slope and intercept coefficients*" (Neil, 2014; pp.685). To ensure that this procedure is reliable seven separate test statistics must be computed under the null hypothesis of no cointegration among the nonstationary panels. These tests are calculated by retrieving residuals from several models and grouped in two types: group and panel. While the "group-mean" type has only three test statistics - ρ-statistic, PP-statistic and ADF-statistic - and averages the results of individual time-series test values (or more generally the "heterogeneity" in the panel); the second type is devoted to analyze the "panel-mean" by four different test statistics - υ-statistic, ρ-statistic, PP-

statistic and ADF-statistic - that pool all the observations along the within-dimension (Pedroni, 1999). The author clarifies also that the all these statistics of interest have been readjusted to follow a standardized normal distribution under the null hypothesis of no cointegration.

Continuing to follow Neal (2014), another important question entails with the conflictual results that may arise from the seven cointegration tests. Pedroni (2008) justifies such outcomes as related with data specificities but nonetheless elucidates that while for small samples (as it is the database associated with this thesis) ADF statistics are more suitable because provide a more reliable result in these cases (Pedroni, 1999). Even so, the more statistics support the same result of cointegration the better the consistency and trustworthiness of the final estimators (Eberhardt, 2011). Appendices C and D show that in all the different models used at least three of the seven tests required by the estimation restrictions - with special attention to Group ADF statistics - are above the critical level assuring strong cointegration levels amidst the variables.

3.5.3 - PANEL CROSS-SECTION DEPENDENCE

One last intermediary step required in order to achieve a consistent estimation deals with cross-section dependency testing. To study this aspect that directly impacts the effiency of the estimation trough general shocks or by unobserved common factors (or even both) it will be used the Pesaran CD test. The latter by testing the correlation coefficient between variables or residuals, follows a standard normal distribution under the null of nonexistent cross-sectional dependence. As we can see depicted in Appendix E, the results across the models indicate that in all models the null hypothesis of no cross-sectional dependence is rejected, by other words, the same shock impacts all the countries in the sample.

3.5.4 – PEDRONI'S PANEL DYNAMIC OLS (PDOLS)

Given the previous results it is foreseeable a successful estimation of the relationship between the socioeconomic variables and income inequality by making use

of Pedroni Group-mean panel dynamic OLS which stands as an uncomplicated yet proficient estimate of the vector of cointegration (Neal, 2014). Considering:

$$y_{i,t} = \alpha_i + \beta_i x_{i,t} + \sum_{j=-P}^{P} \gamma_{i,j} \Delta x_{i,t-j} + \mu_{i,t} \qquad \textbf{(1)}$$

Where $i = 1, \ldots, N$ is the number of panel units; $t = 1, \ldots, T$ stand for the time periods, $p = 1, \ldots P$ comes up as the number of lags in the DOLS regression, β_i is the slope coefficient and $x_{i,t}$ is the matrix of explanatory variables. Considering Pedroni (2001), Mark et al. (2003) and Neal (2014) the use of such estimation method is quite advantageous because not only estimate a general coefficient for the estimation but also considers heterogeneous slopes allowing the coefficients to vary according the "individual" groups, ie, countries, in the sample. The coefficients are then estimated trough $z_{i,t}$ (that includes lags and leads of the covariates' vector) by:

$$\hat{\beta}_{PDOLS} = \left[\frac{1}{N} \sum_{i=1}^{N} \left(\sum_{t=1}^{T} z_{i,t} z'_{i,t} \right)^{-1} \left(\sum_{t=1}^{T} z_{i,t} \left(y_{i,t} - \bar{y} \right) \right) \right] \qquad \textbf{(2)}$$

Another final aspect worth mention is the fact that is possible to apply the Group-Mean PDOLS to both nonstationary and stationary variables as long they do not represent the majority of the independent variables nor the dependent variable (Neal, 2014). Is it at the moment possible to estimate some models and study with more detail the long-run relationship between income inequality and some socioeconomic variables using vectors of cointegration.

4. <u>EMPIRICAL RESULTS</u>

Given the estimation conducted using the cointegration estimator proposed by Pedroni (2001; 2004) the results ended up supporting the theories that suggest a more negative preponderance of inequality. Using these same results, provided by the models ahead, we can clearly state that some of the latest changes in modern capitalism have induced higher propensity to crescent top-ladder income households, and therefore, acuter economic inequality. As all models were estimated not only using Top One Percent (TOP1) and Top Ten Percent income (TOP10) simultaneously but also sequentially; this means that the variables chosen as proxies to nowadays income inequality behavior were tested while influencing one another but were also tested *per se*. The intention here was to observe how different the evolution of the *ultra rich* and TOP10's income when exposed separately to the same economic phenomena.

The estimations are present in Tables 7, 8 and 9. To test the several research questions, the conclusions redrawn were sampled in three different topics. The first topic to be addressed concerns the role of economic variables such as globalization, (de)industrialization and financialization as motion settlers for the income of the wealthiest households since 1980. The second topic replicates the latter idea but this time including social factors as the Education Gini and Life Expectancy; and finally the third dimension accesses the impact that Top-Income accumulation on GDP dynamics.

The solidest conclusion, seen throughout the different models, is that the income share held by the TOP1 and the TOP10 to be always positively correlated among them, as expected. Nonetheless other closure comes up from the fact that those same variables derive different behavioral dynamics when subjected to the same phenomena. In fact there is a positive direct relation between the TOP10's income and the economy's exposition to world trade, but half the models determine that relation for the TOP1 to be negative or statistically insignificant (Model A, B and D). In accordance to Palma (2010): the ultra rich tend to accumulate income and wealth primarily from national economic structures and thereby have lower response (or none at all) to the degree of dependence of their respective economy to international trade.

	MODEL A	MODEL B	MODEL C	MODEL D	MODEL E
DEPENDENT VARIABLE	TOP1	TOP1	TOP1	TOP1	TOP1
COVARIATES					
TOP10	**0.1636** (22,8)	--	--	--	--
TRADE	**-0.17** (-2,915)	**-0.0060** (-3,285)	**0.0254** (12,7)	**-0.03385** (-5,508)	**0.01347** (6,262)
UNEMPLOYMENT	**0.0010** (6,879)	**-0.0002** (2,182)	**0,00059** (4,394)	--	--
SAVINGS	--	**0.0573** (8.044)	--	--	--
SERVICES	--	**0.001** (8,542)	**-0.0004*** (-1,483)	**0.0001439** (3,045)	--
INDUSTRY	--	--	**0.03** (15,86)	**0,001469** (4,181)	--
TOTAL OPEN ECON.	--	--	--	--	**-0.002155** (-2,253)
RURAL ECONOMY	--	--	--	--	**-0,02218** (-5,269)
Adj R^2 FIXED EFFECTS	0.1745	0.0826	0.1172	0.1652	0.0945
DEPENDENTE VARIABLE:	TOP10	TOP10	TOP10	TOP10	TOP10
COVARIATES					
TOP1	**1.407** (21,51)	--	--	--	--
TRADE	**0,1482** (19,58)	**0,1314** (6,147)	**0,071** (20,3)	**0.09625** (10,57)	**0.1816** (11.42)
UNEMPLOYMENT	**-0.003** (-3,447)	**-0.0255** (2,785)	**-0,00166** (-4,94*)	--	--
SAVINGS	--	**-0,054** (7.132)	--	--	--
SERVICES	--	**0,039** (7,174)	**-0,001455** (-5,263)	**0.00124** (7,733)	--
INDUSTRY	--	--	**-0,001353** (-13,86)	**-0.02218** (-2,7783)	--
TOTAL OPEN ECON.	--	--	--	--	**-0.0213** (-6.781)
RURAL ECONOMY	--	--	--	--	**-0.0409** (-3.072)
Adj R^2 FIXED EFFECTS	0.2469	0.1309	0.1842	0.1334	0.0727
TOTAL OBS	**1271**	**1271**	**1271**	**1271**	**1271**
TOTAL COUNTRIES	**41**	**41**	**41**	**41**	**41**

Notes: On bold are written the β coefficients while between brackets are expressed the Standard Errors

*** p<0.01, **p<0.05, * p<0.1. Robust standard errors in parentheses. All regressions include time trend.

Table 7 *– Economic Dimension Modelization*

With the inverse behavior from globalization comes up civilian unemployment. While TOP10's income is hurt by higher levels of unemployment, the households composing the TOP1 seem to be able to retrieve increased wealth in adverse economic situations (Model A, B and C). This last idea is why the "social aversion coefficient" to inequality grew so larger in the recent years of worldwide recession: the richer getting richer and the poor getting poorer only unleashes social turmoil. Moving to the role of Savings as theoretically depicted by Mirrlees (1971), we found that only applies to the TOP1 households: populations with higher savings rate tend to produce higher levels of income solely for ultra rich but not for the *not so* wealthy. (Model B).

Shifting attention towards industrial production we find that the individuals composing the TOP10 have been capitalizing the gains of general deindustrialization in the developed countries while the negative impacts have been felt upon the *ultra rich* households (Model C and D). Heavily intertwined with the loss of industrial strength it is found the overweight of the service sector, that since the mid-1990s has speeded-up at an exponential rate (Palma, 2010), and has enlarged the income in both tops of the pyramid. Regarding the role of globalization, the results are found to be mixed, but the overall majority of Models (B, C, D) point to a positive and significant relation no matter referring to TOP1 or TOP10, as would be to expect according to Brynjolfsson and McAfee (2011). The essential conclusion is that widening inequality comes as the cost of globalization. Considering that the number of multinational companies rose from 7.000 in 1970 to 38.000 in 2013 (Palma, 2014) and also that financial investors can proceed their activities in real time and across different countries make easier for the elites to detain much higher riches. It is exactly Models B, C and D point out.

A final important conclusion links with the Kuznets's idea of rural-urban inequality. Making use of two dummies variables: TOTALOPEN and RURAL ECONOMY (each one assuming the unitary value for countries where, respectively, trade surpasses more than 80% of the GDP and have more than 20% of the population habiting in rural areas) we also witness that the behavioral dynamics of the elites are quite similar, meaning that economies marked by a minor dependence of global trade as well as a larger number of rural population tend to foster less income and wealth for the elites, whether TOP1 and TOP10. Nevertheless we also see the confirmation that the richest individuals are indeed those that benefit the best from national productive structures by looking at the coefficients in Model E. Given this conclusion we can confirm Ostry *et al* (2014) as

correct: economies that are more open to foreign commerce and present higher levels of urban population have an apparent higher centripetal effect in income amongst the wealthiest individuals.

As ending statement on the Economic Dimension, it is important to refer that models estimated using fiscal variables (Direct and Indirect fiscal burden), Productivity by hour and R&D statistics were found to be inconsistent or irrelevant for the present analysis.

	MODEL F	MODEL G	MODEL H	MODEL I
DEPENDENT VARIABLE	**TOP1**	**TOP1**	**TOP1**	**TOP1**
COVARIATES				
TOP10	**0.0631** (27,51)	**0.1537** (14,27)	--	--
TRADE	**-0.00656** (-4,191)	--	**-0.008051** (5,147)	**-0.04359** (-10,93)
UNEMPLOYMENT	**-0.001579** (-11,74)	--	--	**0.00036** (3,921)
SAVINGS	--	--	**0.03346** (1,96)	**-0.3607**** (-1,619)
EDUCATION GINI	**0,09504***** (0.1338)	**0.08246** (10,72)	**0.3346** (3,112)	**0.1825** (9,648)
LIFE EXPECTANCY	--	**-0.0005** (-6,824)	--	--
RURAL POPULATION	--	--	**-0.0020***** (0,8314)	--
Adj R^2 FIXED EFFECTS	0.0923	0.1063	0.0752	0.1361
DEPENDENTE VARIABLE:	**TOP10**	**TOP10**	**TOP10**	**TOP10**
COVARIATES TOP1	**0.8599** (8,599)	**0.592** (9,396)	--	--
TRADE	**0.1571** (16,34)	--	**0.1437** (5,352)	**0.2078** (13,61)
UNEMPLOYMENT	**-0.00062** (5,896)	--	--	**-0.004***** (0,003)
SAVINGS	--	--	**-0.2132** (-3,191)	**-0.05794** (-6,19)
EDUCATION GINI	**0.1582** (16,34)	**-0.1872** (-5,024)	**-0.04883** (-16,14)	**-0.05736** (**-7,393**)
LIFE EXPECTANCY	--	**0,0009125** (7,617)	--	--
RURAL POPULATION	--	--	**0.01258** (8,822)	--
Adj R^2 FIXED EFFECTS	0.1231	0.0971	0.1482	0.1436
TOTAL OBS	**1271**	**1271**	**1271**	**1271**
TOTAL COUNTRIES	**41**	**41**	**41**	**41**

Notes: On bold are written the β coefficients while below between brackets are expressed the Standard Errors

*** p<0.01, **p<0.05, * p<0.1. Robust standard errors in parentheses. All regressions include time trend.

Table 8 – Social Dimension Modelization

The assessment of the Social Dimension is expressed in Table 8. The inclusion of this type of variables interacting with economic ones permits a new insight into the overall level of socioeconomic inequality. One important result that stretches from the Social Dimension is the fact that different behavioral dynamics continue to erupt between the TOP1 and TOP10. While the ultra rich increase their income from higher disparities amid educational levels, the TOP10 earnings look like to be negatively correlated with this variables across the generality of the models (G, H, I). The last reasoning applies also for the Life Expectancy: a decrease tends to enlarge TOP1 but reduce TOP10 wealth (Model G). From the combined estimation with social and economic variables we witness again the conclusions retrieved analyzing the economic dimension solely: if by one hand, the TOP1 is positively impacted by means of higher savings and unemployment rates; by the other hand is negatively impacted by higher dependency to global trade (Models F, H, I). In face of these results of prosperity for the *ultra rich* at expense of all the others, the theories purposed by Piketty (2014) seem to find empirical consolidation. Further, the TOP1 income group seems to thrive under general adverse conditions while the same is not applicable to the TOP10, being this occurrence especially worrying given the fact the analysis is worldwide. The results seems strongly consistent for developed as well as emerging countries. On the Social Dimension it was also observed that Expenditure on Education, Age Dependency and Human Capital Indexes were inconsistent or irrelevant for the present analysis.

Additional results assess a much disputed argument: is inequality measured by the lens of the income held by top-ladder households, positively or negatively related with GDP growth? Or even how the income accumulation dynamics are disturbed by the different periods of growth or recession? An approach to these questions using Pedroni's cointegrating vectors can be found in Table 9. The first impression redrawn from the Model J relates with the non-relevance of the GDP dynamics for the TOP1 (Model J) which reinforces the previously presented conclusion regarding some protective shield around these top-income households. As the same does not apply for TOP10, whose income growth is particularly susceptible to GDP movement, we can state that Pedroni PDLOS expresses by one side a procyclical behavior for TOP10 but by other side an acyclical co-movement for TOP1 income, confirming Palma (2010, 2014).

	MODEL J	MODEL K	MODEL L
DEPENDENT VARIABLE	TOP1	TOP1	TOP1
COVARIATES			
TRADE	**0,04975** (6,982)	**0.01296** (3,75)	**0,005259*** (0,8705)
GDP GROWTH	**-0,003168*** (-0,087)	--	--
SAVINGS	**0.1076** (6,94)	--	--
EDUCATION GINI	**0,08425** (8,706)	--	--
SERVICES	--	**-0.00047** (-5,38)	**-0,0005121** (4,573)
BOOM	--	--	**0.00606** (1,908)
CRISIS	--	**-0.008627** (-3,041)	--
Adj R²$_{\text{FIXED EFFECTS}}$	0,0472	0.0789	0.1083
DEPENDENTE VARIABLE:	TOP10	TOP10	TOP10
COVARIATES			
TRADE	**0.01821** (12,51)	**-0,02748** (7,631)	**0.03857** (10,19)
GDP GROWTH	**0,002395** (18,17)	--	**0.1437** (5,352)
SAVINGS	**0.0766** (6,086)	--	--
EDUCATION GINI	**-0.1374** (-9,887)	--	--
SERVICES	--	**0,0015** (6,43)	**0.00139** (10,94)
BOOM	--	--	**0.003104** (4,206)
CRISIS		**-0,03619** **(7,837)**	
Adj R²$_{\text{FIXED EFFECTS}}$	0.0753	0.081	0.1103
TOTAL OBS	**1271**	**1271**	**1271**
TOTAL COUNTRIES	**41**	**41**	**41**

Notes: *On bold are written the β coefficients while between brackets are expressed the Standard Errors*

*** $p<0.01$, ** $p<0.05$, * $p<0.1$. Robust standard errors in parentheses. All regressions include time trend.

Table 9 – Growth/Recession Dichotomy

Combining the scrutiny of the impact from contemporaneous GDP evolution with the international trade level, education disparities and savings patterns levels are presented once again striking resembles of the results found on the previous socioeconomic dimensions: different behavior for TOP1 and TOP10, as exhibited in Model J. Moreover, and as expected, testing for different stages of the economy revealed similar trends in what concerns the evolution of the highest income individuals. In here, this task was assessed by dummy variables BOOM/CRISIS, identifying situations where the GDP growths/shrinks by more than 2%, respectively. Two main conclusions can be driven from here: firstly, even in the presence of the terciarization of the modern economies, TOP1 is again more shielded from recessions than TOP10 (-0,008 Vs -0,03 in Model K) and in the prosper times, they seem to capitalize more efficiently and concentrate upon themselves disproportional higher income (0,00606 Vs 0,0031 in Model L). The second feature worth referring links with the symmetry found upon the results, ie, the growth top-income tends to growth and trump at the same rate according the different stages of the economy (Model J and K).

5. <u>CONCLUSIONS</u>

Although observable for quite some time now, only recently political leaders and influential academics have been brought the rise on economic inequality into discussion. A modern development regarding this topic lays trough the verification of what kind of relationship exists between the income earned by top households and the relatively new driving forces behind financial capitalism. Aiming that goal for this thesis it was analyzed the importance of global trade, deindustrialization patterns, GDP dynamics and education disparities as covariates for top-deciles income in a panel sample of 36 developed and emerging countries spanning from 1980 until 2015.

From the econometrical estimation conducted, results suggest that although TOP1 and TOP10 of income distribution present a symmetric co-movement, the several control variables affect the two TOPs differently. In the broad sense, the ultra rich tend to grow their income in the presence of high levels of unemployment, higher savings rates, and educational disparities. As the same does not occur regarding the TOP10, which is benefited by higher dependence on global trade and by the deindustrialization phenomenon we can clearly state that there are unlike behavioral dynamics between TOP1 and TOP10. Nevertheless some variables tend to impact both TOPs in a similar way. Those variables are the share of services in GDP, where the financialization is accounted, which presented a significant and direct role in the enlargement of golden households for the last four decades. Results also suggest the existence of a procyclical behavior in relation with GDP dynamics when referring to TOP10 household at the same time, TOP1 appointed for a more acyclical behavior. Notwithstanding this dimension, the modelization for booms (sustained growth periods) and recessions (sustained shrinking periods) confirmed that indeed that TOP1can all together make the most of gains during booms and be more shielded from recessions when comparing solely with TOP10. It is possible to deal with results as an existence of an automatic mechanism in financial capitalism that acts as booster for "*sunny days*" and a protective shield for "*rainy days*" in favor of the ultra rich composing the TOP1%. These results seem in line with the recent literature orbiting the topic, particularly Palma (2010, 2014), Piketty (2014) and Dabla-Norris et al. (2015). Adds furthermore the empirical results suggested by some academics to find empirical consolidation in the present work, especially Ostry at al. (2014) and Cingano (2014).

As main contributions for the Literature brought from the present thesis it is found not only the different behavioral dynamics for TOP1 and TOP10 but also strong evidences appointing for a natural tendency towards upper concentration in financial-lead type capitalism. This trend is exceptionally acute for TOP1 individuals, who retrieve the largest gains during booms and receives the lowest losses from recessionary periods. Stretching from this scenario, policy recommendations targeting inequality, particularly at the highest levels seem unavoidable. Such set of policies must, no matter what, include a mix of redesigned fiscal actions as well as improvements in control of capital movements in order to avoid tax evasion. A prompt and coordinated intervention is necessary not only for assuring that the gap between the rich and poor in modern societies does not return to those registered in pre-industrial era; but also to avoid that the natural aversion coefficient to inequality (which is inherent to any given society) can result in larger social unrest.

Although the results presented are strong and consistent, there were several constraints to the modelization: gathering reliable and annually dated variables as proxies for the different dimensions proved to be extreme challenging, as already mentioned by some authors in the Literature Review. Other obstacle relates with the Pedroni co integrated vector, where the instrumental codes for achieving a successful estimation have only recently been created. Such fact complicated the access to statistical information that would be presented in more straightforward manner from traditional estimators as GMM or standard OLS.

As spin-off work it would be captivating to scrutinize this theme with the inclusion of developing nations to observe if the conclusions also hold. Not to mention the inclusion of new variables regarding other macroeconomic aspects such as share of income detained in financial machinations (particularly in *offshores*), weight of redistribution as well as proper R&D statistics while motion settlers to Top Income Concentration.

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APPENDIX A – DESCRIPTIVE STATISTICS

	ED. GINI	GDP. Growth	INDUSTRY IN GDP%	LIFE EXPECTANCY	RURAL POP.
MEAN	0,191	2,088	30,307	74,84	28,279
MEDIAN	0,1764	2,0084	30,031	75,912	26,49
MAXIMUM	0,821	13,70534	48,375	84,005	80,642
MINIMUM	0,0258	-14,5684	11,281	51,557	2,142
STD. DEV.	0,101	3,3950	6,4825	5,6075	14,280
OBSERVATIONS	1476	1476	1476	1476	1476

	SAVINGS RATE	SERVICES IN GDP%	TOP10 IN GDP%	TOP1 IN GDP %	TRADE IN GDP %	UNEM. RATE
MEAN	0,230	63,466	0,3289	0,09	0,7388	7,3132
MEDIAN	0,223	64,967	0,321	0,0859	0,6258	6,8337
MAXIMUM	0,5199	88,53	0,68	0,425	3,9149	27,840
MINIMUM	0,0148	22,307	0,21	0,034	0,12	1,427
STD. DEV.	0,0644	10,509	0,0841	0,0528	0,4683	4,6986
OBSERVATIONS	1476	1476	1476	1476	1476	1476

APPENDIX B – MATRIX OF CORRELATIONS

	EDGINI	GDP	IND	LIFE EXP	RURAL	SAVINGS	SERVICES	TOP10	TOP1	TRADE	UNEM. RATE
ED. GINI	1	0,046	-0,030	-0,333	0,447	-0,030	-0,272	0,012	0,046	-0,291	-0,080
GDP growth	0,046	1	0,195	-0,031	0,202	0,287	-0,188	-0,053	0,040	0,069	-0,051
INDUSTRY	-0,030	0,195	1	-0,278	0,234	0,318	-0,675	-0,105	0,072	-0,264	-0,120
LIFE EXP	-0,333	-0,031	-0,278	1	-0,457	0,086	0,444	-0,127	0,015	0,024	-0,227
RURAL POP	0,447	0,202	0,234	-0,457	1	0,182	-0,497	0,047	-0,151	-0,107	-0,013
SAVINGS	-0,030	0,287	0,318	0,086	0,182	1	-0,253	-0,216	-0,163	0,084	-0,334
SERVICES	-0,272	-0,188	-0,675	0,444	-0,497	-0,253	1	0,170	0,057	0,335	0,187
TOP10	0,012	-0,053	-0,105	-0,127	0,047	-0,216	0,170	1	0,538	-0,005	0,288
TOP1	0,046	0,040	0,072	0,015	-0,151	-0,163	0,057	0,538	1	-0,073	0,157
TRADE	-0,291	0,069	-0,264	0,024	-0,107	0,084	0,335	-0,005	-0,073	1	-0,003
UNEM. RATE	-0,080	-0,051	-0,120	-0,227	-0,013	-0,334	0,187	0,288	0,157	-0,003	1

APPENDIX C – COINTEGRATION TESTS FOR TOP1 AS DEPENDENT VARIABLE

STATISTICS / MODELS	(A)	(B)	(C)	(D)	(E)	(F)
Panel v-statistic	0,63***	-0,7404***	-0,058***	2,003	2,147	0,88***
Panel ρ-statistic	-1,28**	0,9219	0,3988***	-0,8974***	-0,9089***	0,148***
Panel PP-statistics	-3,651	-2,224	-2,517	-2,935	-2,92	-2,731
Panel ADF s	-2,022	-0,8***	-2,135	-2,951	-3,178	-2,337
Group ρ-statistics	0,09904***	-2,395	1,85	0,4391	-2,658	-2,007
Group PP-statistic	-3,722	-2,013	-2,538	-3,016	-2,75	-2,122
Group ADF-statistic	-3,128	-0,725***	-2,538	-3,278	-4,159	-1,775**

Note: *Rejects the null at 10% significance level;** rejects the null at 5% significance level; *** rejects the null at 1% significance level.*

STATISTICS / MODELS	(G)	(H)	(I)	(J)	(K)	(L)
Panel v-statistic	2,546	2,252	-0,058***	-0,3026***	0,5614***	0,4029***
Panel ρ-statistic	-2,4897	-0,808***	0,3988***	-0,74***	-2,6249	-2,0885
Panel PP-statistics	-4,708	-3,823	-2,517	-2,199	-0,9596***	-1,768**
Panel ADF s	-3,451	-3,354	-2,135	-2,448	-1,9889	-1,321***
Group ρ-statistics	-0,5122***	1,047***	1,85	-2,239	-2,052	-1,569**
Group PP-statistic	-4,186	-3,467	-2,538	-2,112	-3,165	-1,901
Group ADF-statistic	-3,521	-3,371	-2,538	-2,603	-2,035	-2,084

Note: *** Rejects the null at 10% significance level;** rejects the null at 5% significance level; * rejects the null at 1% significance level.*

APPENDIX D – COINTEGRATION TESTS FOR TOP10 AS DEPENDENT VARIABLE

STATISTICS / MODELS	(A)	(B)	(C)	(D)	(E)	(F)
Panel v-statistic	1,29**	2,125	0,0081***	0,6579***	0,78***	0,01***
Panel ρ-statistic	-0,62***	0,308***	0,81***	-1,606**	-1,943	-0,3687***
Panel PP-statistics	-2,365	-3,334	-3,261	-4,282	-4,538	-3,854
Panel ADF s	-2,12	-2,085	-1,837	-2,08	-4,044	-2,404
Group ρ-statistics	1,133***	-1,514**	1,505**	-0,4298***	-4,28	0,8383***
Group PP-statistic	-1,662**	-3,567	-3,511	-4,766	-5,014	-4,405
Group ADF-statistic	-2,257	-3,634	-3,199	-4,104	-4,585	-4,095

Note: *** Rejects the null at 10% significance level;** rejects the null at 5% significance level; *rejects the null at 1% significance level.*

STATISTICS / MODELS	(G)	(H)	(I)	(J)	(K)	(L)
Panel v-statistic	0,78***	2,9155	0,88***	-0,7772***	1,384**	1,492***
Panel ρ-statistic	**-1,943**	**-0,597*****	**0,1487*****	**-0,1107*****	**-0,2714*****	**-0,275*****
Panel PP-statistics	-4,538	-3,681	-2,731	-3,687	-2,465	-2,966
Panel ADF s	**-4,044**	**-1,97**	**-2,337**	**-1,572**	**-2,013**	**-2,339**
Group ρ-statistics	-4,28	1,85*	2,007	-2,049	-2,611	-0,35***
Group PP-statistic	-5,014	**-3,445**	**-2,112**	**-4,106**	**-3,165**	**-3,633**
Group ADF-statistic	-4,585	-2,93	-1,775**	-2,148	-2,063	-3,325

Note: *** Rejects the null at 10% significance level;** rejects the null at 5% significance level; * rejects the null at 1% significance level.*

APPENDIX E – PESARAN CROSS SECTION DEPENDENCE OUTPUTS

DEP. VARIABLE:	TOP 1	TOP10
MODEL A		
Pesaran Test Statistic	30,624	5,071
P-value	**0,000**	**0,000**
MODEL B		
Pesaran Test Statistic	24,455	11,175
P-value	**0,000**	**0,000**
MODEL C		
Pesaran Test Statistic	40,208	22,859
P-value	**0,000**	**0,000**
MODEL D		
Pesaran Test Statistic	22,373	11,258
P-value	**0,000**	**0,000**
MODEL E		
Pesaran Test Statistic	33,912	23,451
P-value	**0,000**	**0,000**
MODEL F		
Pesaran Test Statistic	22,984	4,686
P-value	**0,000**	**0,000**
MODEL G		
Pesaran Test Statistic	7,903	4,051
P-value	**0,000**	**0,000**
MODEL H		
Pesaran Test Statistic	11,501	8,950
P-value	**0,000**	**0,000**
MODEL I		
Pesaran Test Statistic	32,777	18,643
P-value	**0,000**	**0,000**
MODEL J		
Pesaran Test Statistic	32,420	18,532
P-value	**0,000**	**0,000**
MODEL K		
Pesaran Test Statistic	22,533	10,413
P-value	**0,000**	**0,000**
MODEL L		
Pesaran Test Statistic	23,103	10,542
P-value	**0,000**	**0,000**