

The Kuznets Curve and Inequality:

A Comparative Study of 27 OECD Countries Across 30 years of Neo-Liberal Economic Policies

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Abstract

The recent 2014 World Economic Forum in Davos, Switzerland has highlighted how the increasing income inequalities across different countries represent one of the major challenges for world leaders in upcoming years (World Economic Forum, 2014). This paper analyzes the trends in growth and inequality across 27 countries part of the Organization of Economic Cooperation and Development (OECD) and tries to evaluate what lies at the base of these phenomena. The period considered is from the early 1980s to the late 2000s, a choice largely motivated by the limited availability of data on income inequality. This time frame also allows the analysis to take into full account the impact that homogeneous neo-liberal economic policies have had on the countries considered in the sample. Through an extensive econometric analysis of the data, it is hard to establish which of the numerous possible causes had the most decisive impact on the rising income inequality across the OECD. Important observations are made on the evolutions of these trends as the sample's countries undertook similar economic policies with different outcomes in terms of growth and inequality. The paper concludes by proposing a more comprehensive understanding of the Kuznets' curve, moving away from the standard model of development toward an adjusted analysis able to explain the different countries' evolutions through the previous 30 years.

Introduction

Neo-liberal economists have often looked at inequality as one of the key incentives toward the maximization of societal economic outputs. The Efficiency-Equity tradeoff is one of the greatest dilemmas faced by policy makers when decisions regarding taxes and public spending are taken. After the 2008 Great Recession, however, debates over income inequalities left the economists' academic offices and became a central topic of discussion for journalists, politicians, and protesters. Movements like Occupy Wall Street coined the "1%" expression, accusing the economic policies undertaken in previous years to have disproportionately helped the wealthiest Americans at the expense of the rest of the population. According to a recent research paper published by Oxfam, currently more than half of the world's total wealth is in the hands of the top 1 percent (Fuentes-Nieva & Galasso, 2014). Such a concentration of prosperity within a few families constitutes a massive societal problem. Economic theory claims that in a highly unequal society, consumption will be greatly reduced due to the excessive saving rates wealthy individuals maintain. This will lead to a smaller economic multiplier and an overall lower economic growth. Other problems are related to the capability of prosperous people to overly influence politics through lobbying and donations to certain candidates. Furthermore, children born into low-income families will enjoy fewer educational and job-related opportunities. The OECD has published numerous reports on the rise in inequality, suggesting that the economic policies following the neo-liberal dictates of the Chicago School of Economics lie at the base of this rising discrepancy between the 1% and the rest (OECD, 2008 & 2011). In fact, the 27 OECD countries considered in this analysis have all followed the policies championed by such giants of this economic vision of the world as Margaret Thatcher and Ronald Reagan (see Table on Top Income Marginal Tax Rate). In particular, the 2011 "Divided We Stand – Why Inequality Keeps Rising" report, highlights three possible causes of this rise in income inequality: globalization, technological progress, and policy choices (OECD, 2011). Building on

the analysis provided by Professor Robert Moffitt, this paper has also taken into consideration the following additional factors as possible roots of this phenomenon (Moffitt, 2013):

- expansion of the financial sector
- development of international trade
- increase in the service sector's employment
- international migration
- the role of trade unions
- rise in college graduation rates.

What emerges from the analysis of each one of these different possible causes is a virtually uniform trend across the 27 countries in the sample. From the 1980s until the late 2000s, the financial sector has grown on average by 201%, international trade by 58.54%, employment in services by 34.68%, technology (measured as productivity) by 56.5%, economic globalization by 37.6%, and college graduation rates by 198.04%, while the percentage of unionized workers has dropped by 33.65% ([Table 5](#)). All these data indicates a decisive turn from a relatively socialist to a more neo-liberal, highly globalized economy. Not surprisingly, governments have reinforced this trend through a 30.98% cut in the top income bracket marginal tax rate ([Table 8](#)). This had some extremely positive consequences in terms of growth; the GDP per capita, calculated at Purchasing Power Parity (constant 2005 \$) has increased by 69.97% ([Table 7](#)). This greater pie, however, has not been distributed in an equal way. Measuring inequality in terms of after tax Gini, we observe that an overall 8.12% growth has taken place ([Table 6](#)).

This analysis has unsuccessfully tried to develop a univocal model in order to explain inequality. Only the expansions of the financial sector and of international trade seem to have a direct, although weak, relation with these increasing disparities. Nonetheless, the results offer room for further analysis as important considerations are made regarding the trend in growth and inequality across the high income economies considered in the sample.

This paper is organized into four main sections; the initial one illustrates the state of the current debate on the income inequality issue, highlighting the controversial nature of the topic. The next section presents the trends in growth and inequality and makes some important observations regarding the shortcomings of the Kuznets' curve. The third section presents the econometric model adopted to explain this rise inequality. Finally, a conclusive paragraph highlights the need for further research and the contribution this paper makes to the ongoing debate on inequality.

Section 1 - Literature Review

The topic of income inequality has drawn the interest of many economists long before it was brought to the attention of the general public following the 2008 Great Recession. Regardless of the extensive analysis, however, what lies at the base of this issue remains a highly controversial discussion. The OECD's report "Divided We Stand" arguably represents the ultimate analysis on this topic; its 386 pages of insight into the issue are unmatched in terms of depth by any other publication. Nonetheless, its conclusion is that "the empirical evidence as to the key drivers of inequality remains largely inconclusive" (OECD, 2011). Not surprisingly, therefore, different economists have presented alternative explanations for this phenomenon. Mauricio Larrain claims that financial liberalization has played an important role in the rise of earning inequalities, particularly in those industries with greater financial needs (Larrain, 2012). Aurélie Cassette, Nicolas Fleury and Sylvain Petit have instead focused on the impact of international trade of goods and services as a possible cause for the increase in earning inequalities (Cassette, Fleury & Petit, 2012). They found that the progressive rise in trade openness that we have witnessed from 1980 until 2005 has led to a long run increase in income inequality. Pan-Long Tsai, Chao-His Huang and Chih-Yuan Yang have concentrated on globalization, claiming that only highly developed countries seem to enjoy a fairer distribution of income as a result of deeper international economic integration. In their 60 countries' sample, the developing ones have moved toward a more

unequal distribution of wealth (Tsai, Huangy & Yangz, 2012). The Nobel Laureate Simon Kuznets was a pioneer in the study of income inequality, writing in 1955. In his analysis, he theorized how an inter-industry shift to the service sector will have an impact on earning inequalities, although such an impact is almost irrelevant to the entire population's income distribution (Kuznets, 1955). Another common factor which, according to economic theory, has an impact on earning inequalities is international migration: a flow of low skilled labor will push wages down for native workers with comparable abilities. Joakim Rust and Arne Bigsten have confirmed this observation, creating a model able to encompass the impact of international capital mobility on this trend (Ruist & Bigsten, 2013). Labor unions also have an influence on earning inequalities, although the direction of such an impact is highly ambiguous. As Daniele Checchi and Cecilia Garcia-Penalosa have argued, greater labor union power will lead to higher minimum wages (pushing the Gini down) and also to higher unemployment (pushing the Gini up, Checchi & Garcia-Penalosa, 2010). As my analysis will confirm, the impact of such a trend on inequality is not clearly definable, although a drastic reduction in labor unions since the 1980s has taken place across the OECD. Improvements in overall economic conditions have also led to a rise in college graduation rates. This trend is connected with skill-biased technological changes (SBTC), which can be defined as technological progress that requires very well compensated, highly trained staff. Both SBTC and a greater concentration of college graduates have been hypothesized to have an impact on earning inequalities since they reward the few over the many. Lloyd Gruber and Stephen Kosack have analyzed how higher college enrollments led to rises in inequality, particularly in developing countries (Gruber & Kosack, 2014). Alexandre Almeida and Óscar Afonso argue that, across the OECD, SBTC had a bigger impact on inequality than international trade (Almeida & Afonso, 2010). Finally, government plays a key role in redistributing wealth as well. Isabelle Joumard, Mauro Pisu and Debbie Bloch have all written extensively about the redistributive effects of taxes on income inequality (Joumard, Pisu & Bloch, 2012). This paper will not include the top income bracket marginal tax rate in the model. We will use the after-

tax GINI as the dependent variable of the regressions, and, therefore, the effect of taxes will already be taken into full account. Nonetheless, how this tax rate has changed during the past 30 years will be mentioned to exemplify the different governments' attitudes toward inequality ([Table 8](#)).

Section 2 - Trends in growth and income inequality across the OECD Countries

Income inequality across the OECD has been increasing since the 1980s, when statistics regarding the distribution of income were initially released by the member states. Currently the Organization of Economic Cooperation and Development includes 34 member countries with the recent (2010) entry of Chile and Israel. In order to be included in this economically elitist group, the countries have to be committed to trust, integrity and transparency. They must also show a commitment to democratic institutions, the market economy, and sound reforms of the financial sector in order to ensure a sustainable growth of the world economy (OECD Website, 2014). Due to these strict admission requirements, usually the countries within the OECD are considered high income economies, making them ideal for comparative quantitative analysis.

The sample analyzed in this paper includes only 27 countries due to the limited availability of data on income inequality. The countries considered are: Australia, Austria, Belgium, Canada, Chile, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Ireland, Israel, Italy, Japan, Luxembourg, Mexico, the Netherlands, New Zealand, Norway, Portugal, Spain, Sweden, Turkey, the United Kingdom, and the United States. The level of income inequality is measured with the Gini Coefficient, a statistical tool introduced by the Italian mathematician and sociologist Corrado Gini in 1912. Such a coefficient ranks how income is distributed in a nation on a scale originally from 0 (perfect equality) to 1 (perfect inequality, meaning everything is owned by a single individual), which is then typically multiplied by 100. Countries with high income inequality will have a higher Gini value than more equal ones, and vice versa.

The data on income inequality are drawn from the OECD's 2011 publication "Divided We Stand – Why Inequality Keeps Rising"; the analysis compares the Gini values of the late 1980s to those of the late 2000s levels and establishes a cross country comparable trend.

Economic growth is instead measured using the World Bank's World Development Indicators. In particular, in order to make the different levels fully comparable, this analysis uses Gross Domestic Product (GDP) per capita, measured in 2005 constant international dollars at Purchasing Power Parity. The results show that regardless of the increased inequality across the sample countries, their 69.97% average growth rates have been remarkable ([Table 7](#)). Basic econometric techniques are useful to fully comprehend this thirty-year-long trend in growth and inequality. Regressing the sample countries' 1980s Gini coefficients against the logarithm of the 1980 GDP per capita level yields the following result:

$$(1) \text{ Gini 1980s} = 162.4119 - 13.57006 (\text{GDP per capita 1980}) \quad R^2 = 0.5398 \\ (29.30284) (2.993722)$$

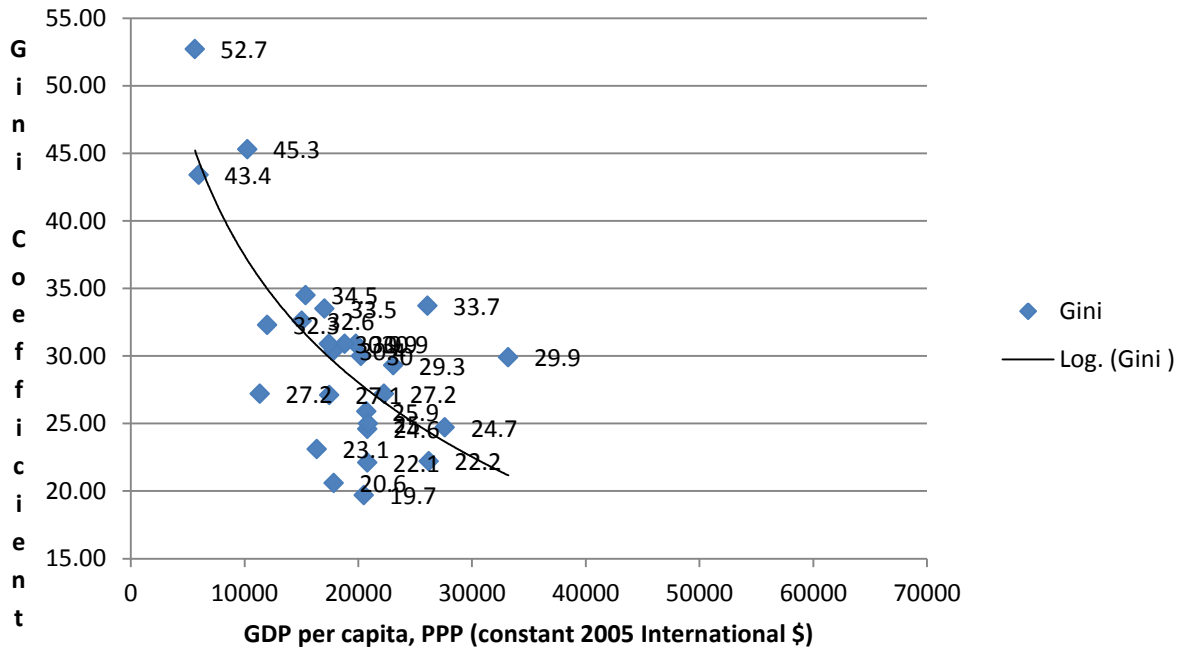
Plugging in the late 2000s values, we get:

$$(2) \text{ Gini 2000s} = 134.2558 - 9.95848 (\text{GDP per capita 2012}) \quad R^2 = 0.3374 \\ (38.00312) (3.66668811)$$

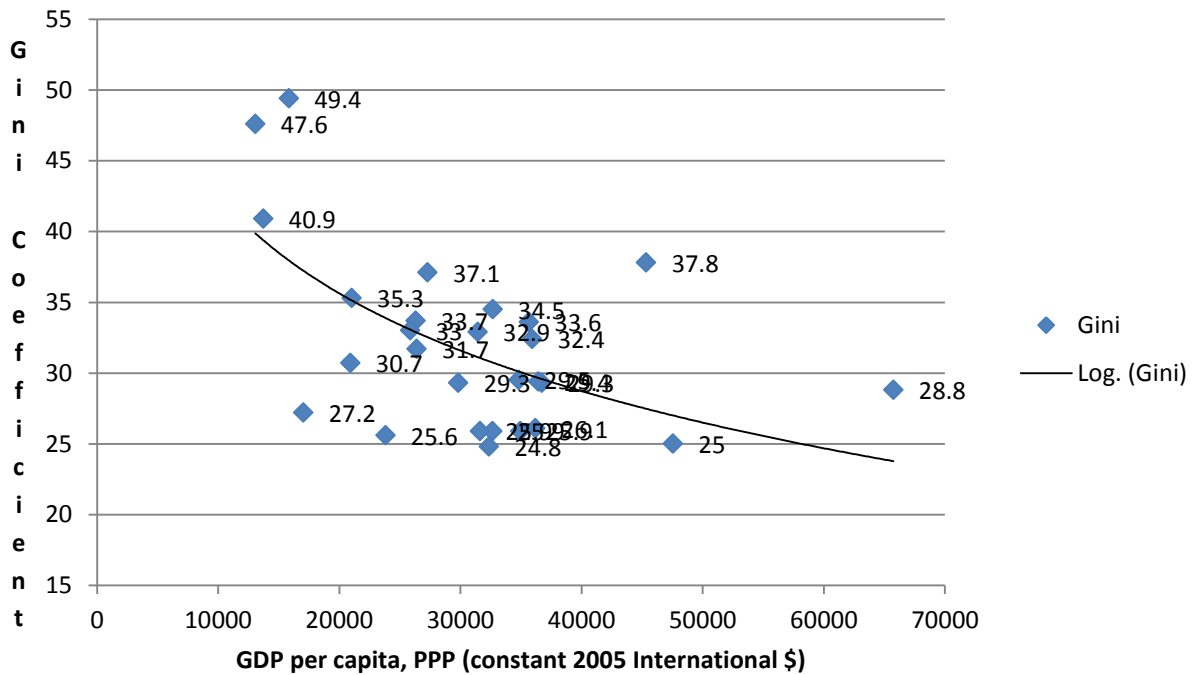
Both these coefficients are statistically significant: the 1980s at the 1% confidence interval and the 2000s at the 5% level. The 2000s' lower negative coefficient is consistent with the Stage 2 Kuznets' theory of development ([Table 2](#)), as highly unequal and less developed countries in the 1980s have seen their increased wealth distributed in a fairer way in the last 30 years.

A graphical image of these trends in growth and inequality will provide a more concrete idea of the economic transformation across the OECD after 25 years of free market oriented policies.

Graph 1 - 1980s



Graph 2 - 2000s



As the graphs highlight, in 25 years we have witnessed a movement of the sample countries toward a higher average level of inequality, approximately around a Gini Coefficient from 30 to 35. A common statistical measure of the spread of a certain distribution is the Average Absolute Deviation; considering the Y-axis variable (inequality), we notice how the Average Deviation dropped from 5.29 to 4.78, a 9.63% decrease. This drop shows how the countries with truly high inequality in the 1980s moved toward lower levels, while more equal countries in the 1980s have grown unequal since then.

An opposite trend is observed in growth trend. In the 1980s, countries tended to concentrate around the \$20,000/\$30,000 per capita range; since the implementation of the neo-liberal economic policies however, some countries spiked, greatly outpacing the others. The Absolute Deviation passed from 4,547.629 to 8021.178, a 76.38% increase. These spreads in growth associated with a cross countries' concentration in inequality explains the 2000s flatter logarithmic curve and leads to important observations regarding the Kuznets curve and the basic theory of international trade.

Table 1 – Sample Countries by Levels of Inequality and Growth

	GDP 1980s	GDP 2000s		Gini 1980s	Gini 2000s
Low Income (\$0 - \$15,000)	5 countries: Chile, Hungary, Mexico, Portugal, Turkey	2 countries: Mexico, Turkey	Extremely High Inequality (50-100)	1 country: Chile (1990)	0 country
Medium Income (\$15,000 - \$30,000)	21 countries: Australia, Austria, Belgium, Canada, Czech Republic (1990), Denmark, Finland, France, Germany, Greece, Ireland (2000), Israel, Italy, Japan,	10 countries: Chile, Czech Republic, France, Greece, Hungary, Israel, Italy, New Zealand, Portugal, Spain	High Inequality (40-50)	2 countries: Mexico, Turkey	3 countries: Chile, Mexico, Turkey

	Luxembourg, Netherlands, New Zealand, Norway, Spain, Sweden, UK, USA				
High Income (\$30,000 - \$45,000)	1 country: Ireland (2000)	13 countries: Australia, Austria, Belgium, Canada, Denmark, Finland, Germany, Ireland, Japan, Netherlands, Sweden, UK	Medium Inequality (30-40)	10 countries: Australia (1990), France, Greece, Israel, Italy, Japan, Portugal, Spain, UK, USA	11 countries: Australia, Canada, Greece, Israel, Italy, Japan, New Zealand, Portugal, Spain, UK, USA
Very High Income (\$45,000 - \$60,000)	0 countries	2 countries: Norway, USA	Low Inequality (20-30)	13 countries: Austria, Belgium, Canada, Czech Republic, Denmark, Finland, Germany, Hungary, Ireland, Luxembourg, Netherlands, New Zealand, Norway	13 countries: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Hungary, Ireland, Luxembourg, Norway, Sweden
Extremely High Income (over \$60,000)	0 countries	1 country: Luxembourg	Extremely Low Inequality (0-20)	1 country: Sweden	0 countries

Simon Kuznets was a Belarus-American economist and statistician, who devised a model relating growth and inequality. In the Kuznets analysis of development, countries grow unequal in the first stage of industrialization, when a few people are holding the technological advantage over the rest of the population. As time goes on, however, the increase in productivity allows the lower income classes to reap the trickle down benefits of higher supply and demand, leading to a decrease in inequality (Kuznets, 1955). Thomas Piketty and Emmanuel Saez updated his analysis, adding a third stage of

development where the globalization and financial integration of the leading economies lead to another rise in inequality as income per capita rises (Piketty & Saez, 2003). This could also be considered a second cycle of development consistent with Kuznets' analysis as a given economy shifts toward services (List & Gallet, 1999).

Table 2 – Kuznets and Piketty-Saez Models of Development

Stage of Development	Effect on growth and inequality	Reason
Stage 1 (Kuznets)	Growth ↑, Inequality ↑	A technological breakthrough allows a small portion of the population holding such a technology to accumulate great amounts of wealth
Stage 2 (Kuznets)	Growth ↑, Inequality ↓	The improvement in productivity allows lower income individuals to reap the trickle down benefits of better economic conditions
Stage 3 (Piketty and Saez)	Growth ↑, Inequality ↑	The rise in earnings in the financial sector allows for a further concentration of wealth in the hands of the top income families

This paper confirms Kuznets and Piketty and Saez' insights. The most unequal countries in the 1980s were also the least developed ones in terms of GDP per capita. Since then, their Gini coefficients have decreased, with the partial exception of Mexico, which grew unequal during the 1990s and achieved a fairer distribution of income in the past decade (See [Table 6](#)). These countries are going through a Stage 2 development, with the lower income classes enjoying the benefits of economic growth.

On the upper tail of the GDP distribution however, countries relatively equal in the 1980s have experienced a concentration of earnings in the hands of the top income families. This trend is consistent with the third stage of Piketty and Saez' theory of economic development. Sweden, Finland, Germany,

Israel, Norway, the U.S.A. and the U.K. all belong to this group of countries, which entered the 1980s as developed economies and have gone through a period of fast growth and increased inequality since then.

The econometric analysis confirms that the countries with the highest Gini in the 1980s are the ones who registered the greatest percentage drop in these 25 years. Regressing the percentage change in inequality from the 1980s to the late 2000s on the logarithm of the 1980s' Gini values, we get a coefficient of -0.2830741 , significant at the 1% confidence level. Therefore, the countries with high inequality in the 1980s registered a lower (often negative) percentage change since then, while the more equal ones (low 1980s Gini) faced a stronger, positive increase in inequality. This confirms the trend toward the center of the distribution curve of the inequality values, with fewer countries in the upper and lower tail.

A similar result is achieved when regressing the percentage change in the 1980-2012 GDP per capita on the logarithm of the 1980 GDP per capita level (World Bank, 2013-14). Here we find a coefficient of -0.3097992 , which is not statistically significant at the 10% confidence level, due to a standard error of 0.2507395 . The regression highlights how the countries with the lower GDPs per capita in 1980 have registered the largest percentage change. The lack of statistical significance of the coefficient may be due to the singular case of Luxembourg, which was already developed in 1980 ($\$27,622.22$ per capita) and achieved an astonishing 137.98% growth rate over the past 30 years, the second highest after Chile. In fact, by running the same regression without Luxembourg, we get a coefficient of -0.5014939 , which is significant at the 5% confidence level.

By regressing the percentage change in GINI against the logarithm of the percentage change in GDP per capita, we find that growth itself doesn't have any significant impact on inequality. The coefficient of 0.0321759 presents a standard error of 0.0368511 ($P > |t| = 0.391$). Therefore, we can't claim that higher

growth will either lead to lower or higher inequality as the strong inconsistency of the results makes any hypothesis unsupported by statistical evidence.

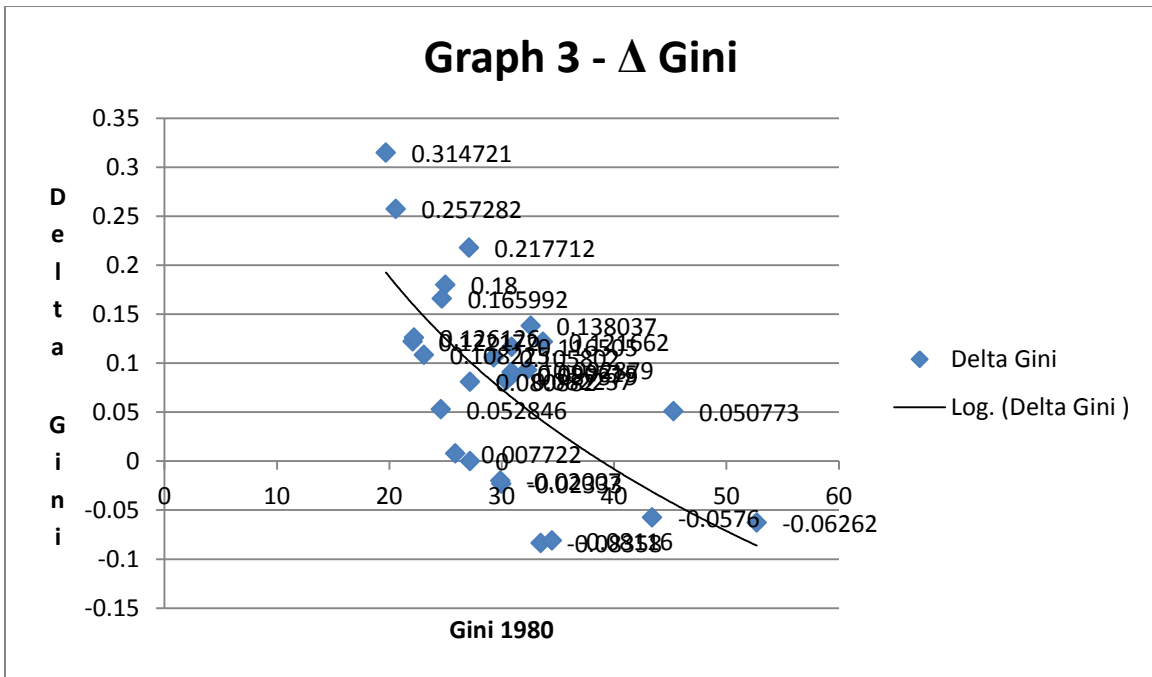
(3) Δ Gini = 1.036022 - 0.2830741 log (Gini 1980) **R² = 0.4321**
(0.2074608) (0.0610605)

(4-a) Δ GDP per capita = 3.723097 - 0.3097992 log (GDP 1980) **R² = 0.2036**
(2.456395) (0.2507395)

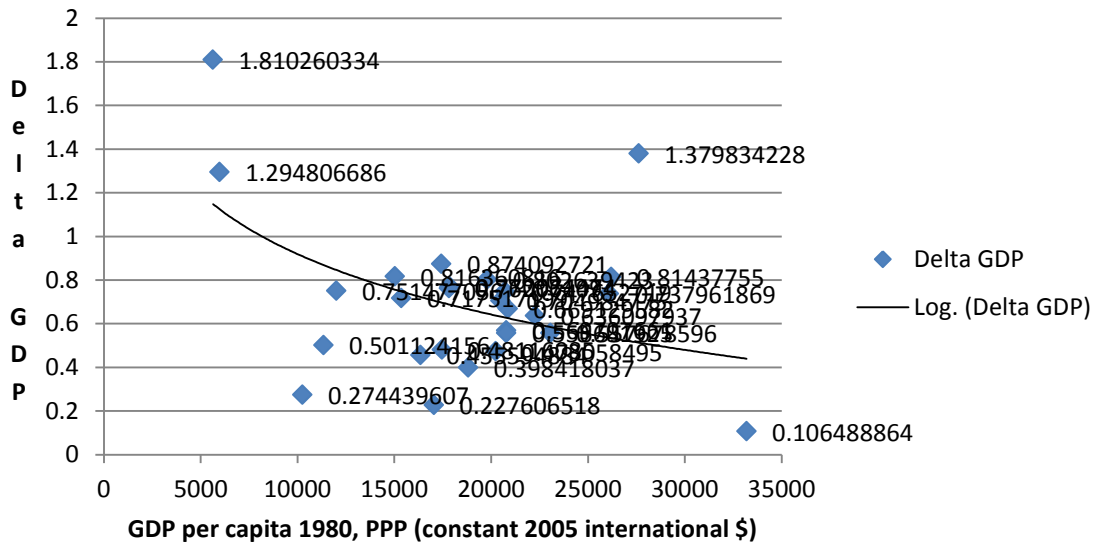
Without Luxembourg:

(4-b) Δ GDP per capita = 5.558731 - 0.5014939 log (GDP 1980) **R² = 0.3759**
(1.970022) (0.1995365)

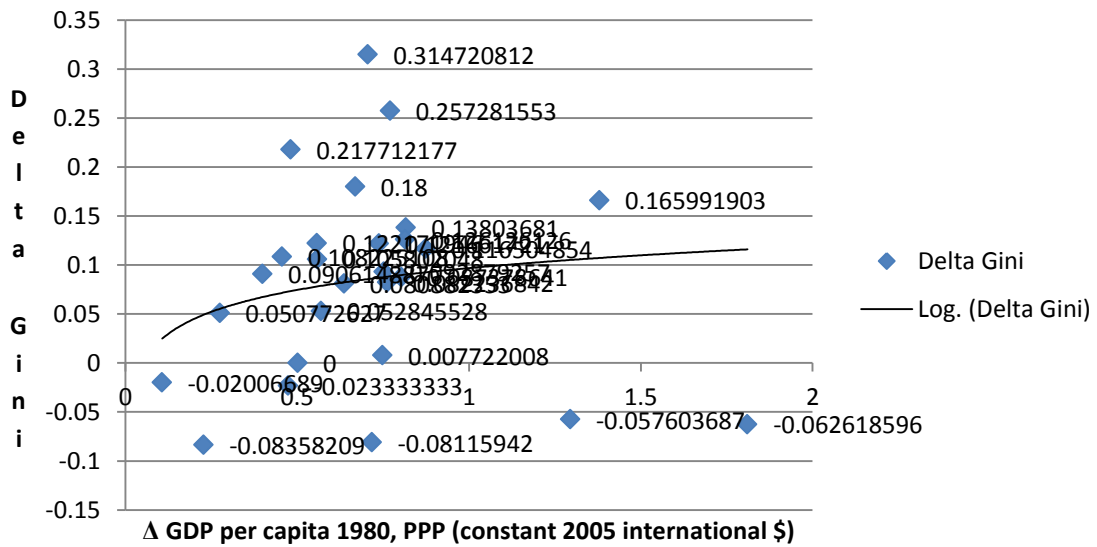
(5) Δ Gini = 0.0968391 + 0.0321759 log (Δ GDP per capita) **R² = 0.0324**
(0.0304166) (0.0368511)



Graph 4a - Δ GDP



Graph 5 - Δ Gini vs. Δ GDP



Section 3 - Econometric Model

The following econometric model has attempted to explain what lies at the base of the rise in income inequality across the OECD. Different economists have attempted to discover what factors have the biggest impact on this trend. The possible causes at the base of this rise considered in this model include:

- a) Expansion of the financial sector
- b) Technological innovation
- c) The increasingly globalized world economy
- d) International Trade
- e) The shift toward a service economy
- f) International migration
- h) Trade unions
- i) College graduation rates.

Each of possible variables has been measured in percentage change considering the early 1980s value and the latest available one as two distinct moments in time used to measure the change across the period considered.

Values used in the model are computed with the following formula: $\frac{(\text{Late 2000s level} - \text{Early 1980s level})}{\text{Early 1980s level}}$.

Data adopted

The data considered in this analysis are drawn from the World Bank Development Indicators, from the OECD iLibrary and the KOF Index of Globalization (World Bank, 2013-14, OECD, 2013-14, KOF (a), 2013).

The dependent variable of the model is the percentage change in the Gini Coefficient of the 27 sample countries from the 1980s to the late 2000s. The data are taken from the OECD 2011 publication “Divided We Stand – Why Inequality Keeps Rising” (OECD, 2011).

In order to measure the expansion of the financial sectors, I have adopted the “Market Capitalization of Listed Companies as % of GDP”, available on the World Bank’s World Development Indicators. Turkey (+ 1,975.947%), Hungary (+ 814.14%) and Mexico (+ 368.52%) have registered the greatest financialization of their economies, while Luxembourg (- 76.19%) and Japan (- 53.69%) went through a shrinking of the respective financial sectors.

Regarding technology, I have used basic economic theory to come up with a useful measure. Labor economics claims that workers are paid a wage which equals the value of their marginal product:

$$\text{Wage} = \text{Marginal Product} * \text{Price of the Marginal Product.}$$

Assuming that prices are constant, an increase in earnings can only be explained by a rise in productivity. Productivity is highly related with technological progress; therefore, devising a measure of productivity offers us an indirect way to measure technological progress across the sample countries in a fairly accurate way. In order to do so, I have used the “GDP per person employed measured in constant 1990 \$ at Purchasing Power Parity”, downloaded from the World Bank’s World Development Indicators. This choice allows us to rule out the impact of inflation on prices and offers a reliable benchmark to compare productivity across countries without the bias of the different purchasing power of the dollar. Under the assumptions of labor economics, the Gross Domestic Product divided by the number of people employed is a true measure of their efficiency at producing as they get paid the value of their marginal productivity. The Cobb-Douglas production function is useful for this approach as it explains rises in total income Y as a function of Total Factor Productivity (A), labor input (L) and capital input (K):

$$Y = A * (L^\alpha) * K^{(1-\alpha)}.$$

Assuming that labor (total number of hours per person worked in a year) and capital input (the real value of all buildings, equipment and machinery) have remained constant, the only factor able to explain a rise in Y would be a higher total factor productivity A or, in other words, technological progress, as it makes both labor and capital more efficient. Claudia Goldin, Lawrence F. Katz, and Ilyana Kuziemko have enlarged this model to take into account education:

$$Y = A * [(LE)^\alpha] * K^{(1-\alpha)} \quad \text{with E representing years of education per worker.}$$

Converting everything to logarithms and taking the derivative over time, we get:

$$\Delta y = \Delta A + (1-\alpha)\Delta k + \alpha\Delta E,$$

where Δy represents change in per capita productivity, ΔA is technological change, Δk is the capital labor ratio, α is labor's share in total output, and E is years of education per worker (Goldin, Katz & Kuziemko, 2006). As productivity increases, assuming k stays constant, either education or technology have to increase. These two factors are strongly correlated inasmuch as technological improvements require skilled technicians to operate them, leaving unskilled and less educated workers behind.

Claudia Goldin and Lawrence Katz have deepened their analysis on inequality by defining the recent computerization of society as a *skill-biased technological change* (Goldin & Katz, 2008). Their conclusion is that although computers have allowed the deaf, the blind, and the physically handicapped to join the labor force, they also have had a key impact on increasing the earnings' gap between workers with different skill sets. Therefore, although these assumptions are fairly strong, I believe the GDP divided by the number of people employed is a reliable approximation of the technological progress across the OECD countries. Using this parameter, we observe that Turkey (+ 163.06%) and Ireland (+ 128.92%) have witnessed the strongest technological improvement ([Table 5](#)). On the other hand, Mexico (- 1.29%) is

the only country in the sample where productivity has decreased since the 1980s (see the Data Appendix – Tables 3-4 for Germany).

Globalization is measured through the “Index of Economic Globalization” produced by the ETH Zurich University’s KOF database. Economic globalization is evaluated on a scale from 0 to 100 based on the actual flow of trade, foreign direct investment and portfolio investment, and the restrictions applying to these flows (KOF (b), 2013). Israel (+ 89.95%) and Mexico (+ 84.29%) are the countries that registered the largest opening to the world economy since the 1980s, while Hungary (+ 9.96%) and Portugal (+ 10.07%) did so to the smallest extent across the sample ([Table 5](#)).

International Trade is measured as “Trade (% of GDP)”, from the World Bank’s Development Indicators. This represents the sum of exports and imports of goods and services as a share of GDP. Turkey (+ 239.36%) and Mexico (+ 184.39%) witnessed the largest increases in trade, while Israel (- 30.02%) and Norway (- 15.19%) experienced the biggest contractions ([Table 5](#)).

The movement toward a service economy has been almost univocal across the OECD. To measure this trend I have adopted the “Employment in services as a % of total employment” from the World Bank’s Development Indicators. The results show that across the past 30 years, Luxembourg (+ 127.29%) and Portugal (+ 76.73%) registered the highest rise in the service sector, while Turkey is the only country to register an opposite trend, with a -16.41% drop ([Table 5](#)).

In a globalized society, free flow doesn’t simply involve trade and investments, but also people. In order to measure the international migration variable, I have used the World Bank’s “International Migration Stock as a % of the total population” time series from the World Development Indicators database. This represents the number of people born in a country other than that in which they live, including refugees. Across the sample, Spain (+ 750.51%) and Greece (+ 462.42%) saw the largest

increase in their stock of migrants, while France (- 3.63%) and Belgium (-1.63%) registered a shrinking of their respective non-native populations ([Table 5](#)).

The shift toward a more liberal economy across the OECD countries saw many governments dismantling some of their socially oriented programs. Labor unions have almost univocally (Spain, Chile and Finland being the only exception) shrunk across the sample countries, and this has been theorized to have a moderate impact on inequality (Checchi & Garcia-Penalosa, 2010). To measure this variable, I have used the data available on the OECD iLibrary from the “OECD Database on Trade Unions” (OECD, 2013-14). This time series shows the percentage of unionized workers over total employees across the period considered in this analysis. Turkey (- 73.3%) and New Zealand (- 69.88%) faced the biggest reduction while Spain (+ 90.25%), Chile (+ 7.45%), and Finland (+ 0.83%) are the only three countries where a greater portion of the labor force is unionized than in the 1980s ([Table 5](#)).

Finally, improved economic conditions and a more skill-demanding labor market have led to a higher college graduation rate. Moreover, this factor may have an impact on inequality (Gruber and Kosack, 2014). To measure it, I have adopted the World Bank’s time series “Number of students in tertiary education per 100,000 inhabitants” from the World Development Indicators (World Bank, 2013-14). The trend shows that Luxembourg (+ 845.16%) and Turkey (+ 713.56%) saw the largest growth in graduation rates, while Canada (- 36.64%) and Germany (+ 33.47%) had the smallest ([Table 5](#)).

The model

All the considered possible causes of inequality have been regressed on the dependent variable GINI using STATA. The choice of a linear or quadratic regression is based on the higher level of significance either option yielded. All the regressions present robust standard error. Due to the choice of regressing the respective percentage changes of the different countries, the number of observations is limited to 27, which renders the model not fully reliable to explain what lies at the base of the trend in income

inequality and may justify why only a few of the considered variables yield significant coefficients. The model still highlights some interesting results that could help integrate the role of international trade and financialization within Kuznets and Piketty-Saez' theories of development and inequality. In order to fully appreciate these results, I have run similar regressions on a reduced number of countries, excluding low income economies (less than \$15,000 per capita) in 1980: Chile, Portugal, Hungary, Turkey, and Mexico. This allows us to isolate those countries that faced a Stage 2 Kuznets' phase of development during these past 30 years, leading to a more comprehensive analysis of how these variables impact inequality at different levels of growth.

Table 3 - Model 1 - All countries

GINI	Finance	Technology^2	Globalization	Trade^2	Union^2	Service^2	Migration^2	College	R²
0.1010788*** (0.0207159)	-0.0095676*** (0.0020371)								0.1382
0.099434*** (0.0209747)		-0.0409655 (0.0254217)							0.0503
0.0970115*** (0.0239521)			-0.040261 (0.0586268)						0.0092
0.0988706*** (0.0218795)				-0.0251996*** (0.0074119)					0.0951
0.1151225*** (0.0320583)					-0.1471738 (0.1151225)				0.0921
0.0844492*** (0.0222651)						-0.0131936 (0.062197)			0.0019
0.0951732*** (0.0192271)							-0.0027106** (0.0012323)		0.0946
0.1079215*** (0.0280693)								-0.0131677 (0.12939)	0.0652
0.1139874*** (0.0244811)	-0.0084563 (0.0124597)	0.0459666 (0.1011451)	0.0494048 (0.0775724)	0.0011181 (0.026195)	-0.0424357 (0.1431876)	0.1091113 (0.1075637)	-0.0034327* (0.0019793)	-0.0249032 (0.0229988)	0.3042

Number of Observations: 27. All countries

***** = significant at the 1% confidence level**

**** = significant at the 5% confidence level**

*** = significant at the 10% confidence level**

Table 4 - Model 2 – No Low Income Economies

GINI	Finance	Technology	Globalization	Trade	Union^2	Service	Migration^2	College^2	R²
0.1118024*** (0.0301228)	-0.0145306 (0.024311)								0.0175
0.1012093* (0.0536132)		-0.0034326 (0.1054039)							0.0001
0.1067639*** (0.025789)			-0.0200925 (0.0692622)						0.0021
0.1135286*** (-0.0326087)				-0.0326087 (0.0554948)					0.0156
0.1325537*** (0.0326273)					-0.1576154 (0.1098801)				0.1035
0.1285748*** (0.0389602)						-0.082427 (0.1201378)			0.0431
0.1184571*** (0.0197626)							-0.0033473*** (0.0011551)		0.1767
0.972353*** (0.0230395)								0.0003847 (0.0007974)	0.0033
0.3027479*** (0.0892912)	-0.026242 (0.0224976)	-0.01204 (0.0909273)	0.2865182 (0.1852017)	-0.0306458 (0.0607439)	-0.3679307 (0.2474964)	-0.7985477** (0.3591488)	0.0061272 (0.0045036)	0.0105557** (0.0047212)	0.4440

Number of Observations: 22. Countries with income per capita < \$15,000 in 1980 (Chile, Hungary, Mexico, Portugal, Turkey) are excluded.

***** = significant at the 1% confidence level**

**** = significant at the 5% confidence level**

*** = significant at the 10% confidence level**

Analysis of the Results - Model 1 – All Countries

When regressing every single variable on the GINI dependent one, the only two yielding significant coefficients are finance ($t = -4.70$, $P > |t| = 0.000$) and trade² ($t = -3.40$, $P > |t| = 0.002$). All the other variables considered tend to have extremely unreliable coefficients that make any inferences about their impact on inequality un-sustained by relevant data. According to this model, all the variables considered tend to have a negative impact on the level of inequality:

- a 100% increase in finance = 0.95% drop in the GINI coefficient;
- a 100% increase in technology = - 4.09% drop in the GINI coefficient;
- a 100% increase in globalization = - 4.02% drop in the GINI coefficient;
- a 100% increase in trade² = - 2.51% drop in the GINI coefficient;
- a 100% increase in union² = - 14.71% drop in the GINI coefficient;
- a 100% increase in service² = - 1.31% drop in the GINI coefficient;
- a 100% increase in migration² = - 0.27% drop in the GINI coefficient; and
- a 100% increase in college = -1.31% drop in the GINI coefficient.

The main reason for these results is that countries like Turkey, Hungary, and Chile often represent positive outliers in many of these variables; these three countries have achieved either a more equal (Turkey and Chile) or unchanged (Hungary) redistribution of income during these 30 years, yielding a negative relation between these variables and the GINI coefficient.

The regression of the aforementioned variables leads to the following function of income inequality:

$$\begin{aligned} (5) \text{GINI} &= 0.1139874 - 0.0084563(\text{finance}) + 0.0459666(\text{technology}^2) \\ &+ 0.0494048(\text{globalization}) + 0.0011181(\text{trade}^2) - 0.0424357(\text{union}^2) \\ &+ 0.1091113(\text{service}^2) - 0.0034327(\text{migration}^2) - 0.0249032(\text{college}). \end{aligned}$$

In this comprehensive regression, the only significant coefficient is the one on union^2 ($t = -1.73$, $P > |t| = 0.100$). These coefficients are more consistent with classical economic theory on income inequality as greater trade unions lead to lower inequality while higher skill-biased technology, globalization, trade, and service correspond to higher inequality. Nonetheless, since of all the coefficients considered, only finance and trade^2 for the one-on-one regressions and union trade for the comprehensive one are significant, those are the only we are going to consider reliable to draw some economic conclusions on this trend in inequality.

Although the expansion of the financial sector is often considered detrimental to the real economy as it creates instability and allows for a concentration of wealth in the hands of a few investment bankers, this analysis highlights a different conclusion (Rajan, 2006). The free flow of capital and goods (international trade) in the early stages of development leads to a more equal distribution of wealth. Of the sample considered, Turkey registered the largest expansion in both financial sector (+1975.94%) and international trade (+239.36%); as a result, its GINI coefficient dropped from 43.2 to the current 40.9. In particular, after a rise of 5.6 in the mid-1990s, the GINI dropped by an astonishing 8.1 points in the following 10 years. My hypothesis is that corporations and small entrepreneurs are able to enjoy cheaper credits from banks following their respective countries' opening to the world economy. As a result, they undertake expansionary business strategies that demand a greater labor force, leading to lower unemployment and fewer people falling behind. These newly founded businesses will probably not gain immediate fabulous returns; therefore, the people benefitting the most from this situation are the employees rather than the employers. More available jobs lead to higher wages and consumption and an overall more equal redistribution of wealth. This situation changes as the economy reaches its maturity (the end of Kuznets model of development). Once the economy has been fully financialized, the employers and top managers begin to gain astonishing returns in the form of bonuses and dividends, while at the same time, the labor market becomes more and more demanding in terms of

skills, leading to a vast section of the population being unemployed due to their limited technical abilities. This is the beginning of the third stage of development theorized by Piketty and Saez. As the regression model 2 shows, the impact of these variables on unemployment changes after the economy reaches a new level of development, although the regressions don't fully support my hypothesis.

Analysis of the Results - Model 2 – No Low Income Economies

Model 2 is highly affected by the reduced number of observations; not surprisingly, it is hard to find significance in the coefficients when the sample considered is reduced to 22. Better data on income inequality would allow a time-series regression, probably leading to more consistent results.

In the one-on-one section of the model, the only variable with a significant coefficient is migration² (t=-2.90, P>|t|=0.009). The -0.0033473 implies that as migration grows by 100%, inequality is expected to drop by 0.33%.

The comprehensive regression yields the following results:

$$\begin{aligned}
 (6) \text{GINI} = & 0.3027479 - 0.026242(\text{finance}) - 0.01204(\text{productivity}) \\
 & + 0.2865182(\text{globalization}) - 0.0306458(\text{trade}) - 0.7985477(\text{service}) \\
 & - 0.3679307(\text{union}^2) + 0.0061272(\text{migration}^2) + 0.0105557(\text{college}^2).
 \end{aligned}$$

Of all these coefficients, the only significant ones are service (t = -2.22, P>|t|=0.045) and college² (t = 2.24, P>|t|=0.044). According to this model, a 10% increase in service should lead to an expected 79.85% drop in inequality. Such a result contradicts the basic economic theory of income inequality (Kuznets, 1955). My opinion is that some measurement errors occurred, which could be solved with more advanced econometric knowledge that I do not currently possess. To claim that doubling the size of the service sector will lead to a 79.85% drop in developed economies is empirically wrong; most of

the countries going through a shift to services tend to grow unequal. Therefore, this coefficient should be ignored in this analysis. More interesting is the coefficient on college², which is significant at the 5% confidence interval. Here, a 100% increase in the college population is expected to yield a 1.05% increase in inequality. David Autor wrote a brilliant paper on the polarization of job opportunities in the U.S., as more technologically oriented means of production require technically advanced skills, usually earned through a college education (Autor, 2010). The Economist has recently published an article regarding the disappearance of middle skill jobs across advanced economies (The Economist, 2014). This trend will lead to higher inequality of income, as previously employed accountants and bookkeepers will either settle for lower wages or simply become unemployed. Not surprisingly, the model predicts that a 100% increase in college graduation rates will lead to a 1.05% rise in inequality across developed economies.

Shortcomings of the model

The model doesn't fully support my hypothesis regarding the relationship between growth and inequality at different stages of development. There are two possible reasons for this:

- a)** The model is not technically advanced enough to encompass these complicated trends
- b)** The hypothesis is wrong.

Due to the extensive literature regarding these trends in inequality, I am more prone to blame my lack of advanced econometric skills and the reduced number of data on inequality across different countries, which makes it extremely hard to create a time series rather than simply compare percentage changes from two distinct points in time. Facundo Alvaredo, Anthony Atkinson, Thomas Piketty, and Emmanuel Saez have recently compiled an extensive database on income inequalities that covers 28 countries across the globe (Alvaredo, Atkinson, Piketty & Saez, 2014). Unfortunately, data on Austria,

Belgium, Chile, Greece, Israel, Luxembourg, Mexico, and Turkey are not available. Furthermore, their approach to measure inequality is based on individual tax return data; this doesn't allow them to compute the GINI coefficient, which is usually considered the most comprehensive index of inequality.

The reason why I believe the mistakes are to be found in the models/measurements rather than in the theory is because all the independent variables considered tend to move in the same direction for most of the sample countries. This is not surprising as the different economies have become more and more integrated. Although they followed similar patterns, only 6 countries (Chile, France, Greece, Ireland, Spain and Turkey) out of 27 registered lower levels of income inequality since the 1980s. Of these 6 countries, Chile and Turkey's GDP per capita (constant 2000 PPP \$) grew by 181.02% and 129.48% respectively; these two countries often constitute positive outliers of the respective distributions (See Chile's 287.37% and Turkey's 1975.947% financial sector expansion) of casual variables that should allegedly lead to higher inequality (Larrain, 2012). I am, as a result, convinced that these variables have a direct impact on inequality beyond what the model is able to capture and that such an impact varies at different stages of development.

Table 5: Variables Considered in the Econometric Model – Percentage Change Early 1980s-Late 2000s

County	Gini	Finance	Productivity	Globalization	International Trade	Service	Migration	Union Trade	College Graduates
Australia	8.74%	48.13%	52.42%	56.23%	30.66%	20.99%	8.31%	-62.90%	170.54%
Austria	0.77%	193.77%	51.68%	47.77%	60.82%	34.57%	63.76%	-50.43%	159.41%
Belgium	5.28%	21.78%	45.97%	12.84%	52.43%	23.16%	-1.64%	-3.82%	114.03%
Canada	10.58%	120.77%	37.69%	9.48%	12.98%	15.91%	36.21%	-18.33%	-36.64%
Chile	-6.26%	287.37%	62.33%	44.29%	36.68%	11.04%	155.29%	7.45%	375.00%
Czech Republic	10.82%	37.41%	55.13%	42.23%	98.24%	19.27%	4.83%	-60.17%	284.25%
Denmark	12.22%	101.76%	54.56%	26.19%	52.53%	24.00%	172.75%	-12.43%	111.41%
Finland	25.72%	92.95%	98.44%	22.70%	28.72%	39.27%	418.40%	0.83%	129.02%
France	-2.33%	130.61%	47.01%	59.23%	28.65%	33.27%	-3.63%	-58.47%	86.41%
Germany	18.00%	77.00%	-0.48%	58.02%	115.56%	26.49%	76.03%	-47.01%	33.47%
Greece	-8.36%	97.39%	39.39%	42.90%	8.86%	74.44%	462.43%	-29.75%	385.20%
Hungary	0.00%	814.14%	74.92%	9.97%	124.66%	76.36%	6.83%	-65.77%	303.13%
Ireland	-2.01%	28.62%	128.93%	24.67%	83.07%	38.31%	207.04%	-34.48%	202.58%
Israel	13.80%	351.33%	43.31%	89.95%	-30.03%	24.15%	4.53%	-68.57%	88.98%
Italy	9.06%	25.24%	30.06%	10.88%	32.49%	40.66%	275.58%	-29.13%	72.42%
Japan	8.22%	-53.69%	66.42%	22.03%	12.65%	29.07%	148.50%	-39.02%	53.71%
Luxembourg	16.60%	-76.19%	44.05%	43.12%	86.10%	127.30%	47.69%	-26.44%	845.16%
Mexico	5.08%	368.53%	-1.29%	84.30%	184.40%	9.56%	47.18%	-28.37%	104.82%
Netherlands	8.09%	51.38%	36.58%	1.16%	60.08%	13.13%	204.04%	-47.79%	91.37%
New Zealand	21.77%	51.02%	20.41%	50.53%	-0.39%	20.63%	45.76%	-69.88%	148.78%
Norway	12.61%	212.39%	62.82%	12.54%	-15.19%	24.24%	229.14%	-6.41%	146.72%
Portugal	9.29%	101.34%	54.91%	10.08%	41.03%	76.73%	217.62%	-64.72%	295.43%
Spain	-8.12%	179.86%	52.23%	59.79%	104.97%	67.56%	750.51%	90.25%	137.25%
Sweden	31.47%	68.93%	75.83%	42.27%	53.87%	25.24%	85.23%	-13.21%	107.74%
Turkey	-5.76%	1975.95%	163.07%	60.03%	239.37%	-16.42%	9.51%	-73.30%	713.57%
United Kingdom	11.65%	31.09%	66.54%	61.89%	26.07%	33.96%	73.81%	-48.05%	188.95%
United States	12.17%	89.29%	63.64%	12.12%	51.46%	23.59%	92.18%	-48.64%	34.47%
Mean	8.12%	201.04%	56.54%	37.67%	58.54%	34.68%	142.14%	-33.65%	198.04%

Section 4 - Conclusions

This paper has investigated the trends in growth and inequality across 27 OECD countries during the past 30 years. The rise in inequality in developed economies has been one of the hot topics of current debate for policy makers, market analysts, economists, and average citizens, particularly following the 2008 financial crisis and the spread of protest movements like Occupy Wall Street. This paper has shown how the relation between growth and inequality has changed following the neo-liberal economic policies implemented since the rise of heroes of this theory such as Margaret Thatcher and Ronald Reagan. The results of 30 years of neo-liberal economic policies is that countries highly unequal in the 1980s achieved a fairer distribution of wealth (Turkey, Chile), while countries with previous highly equal distribution of wealth are now facing greater disparities (Sweden, Norway, New Zealand). This convergence in inequality has been followed by a spread in growth as some countries catapulted (Luxembourg, Turkey), while other lagged behind (Mexico, Greece).

Many economists have tried to explain what lies at the base of inequality. I have attempted to measure which factors have the biggest impact on this trend in inequality. Due to limited available data and the excessive simplicity of the model, the analysis has not found many strong determinants of inequality growth. It appears that the opening of the market to finance and international trade leads to faster and more equal growth in developing economies, while already mature economies tend to grow unequal due to high earnings and more technical knowledge required in these fields. These results are consistent with the Piketty and Saez expansion of Simon Kuznets' model of development. The paper also highlights the necessity for better and more in-depth data on inequality. This will allow statistically significant cross country comparison that could guide policy makers to correctly deal with the Efficiency-Equity tradeoff through progressive taxation and other redistributive measures.

Table 6: Gini Coefficients Mid 1980s-Mid 1990s-Late 2000s

Country	Gini Coefficient Mid 1980s	Gini Coefficient Mid 1990s	Gini Coefficient late 2000s
Australia		30.9	33.6
Austria	25.9		26.1
Belgium	24.6		25.9
Canada	29.3	28.9	32.4
Chile	52.7		49.4
Czech Republic	23.1	25.7	25.6
Denmark	22.1	21.5	24.8
Finland	20.6	22.7	25.9
France	30	27.7	29.3
Germany	25	26.5	29.5
Greece	33.5	33.5	30.7
Hungary	27.2	29.3	27.2
Ireland	29.9		29.3
Israel	32.6	33.8	37.1
Italy	30.9	34.8	33.7
Japan	30.4	32.3	32.9
Luxembourg	24.7	25.9	28.8
Mexico	45.3	51.9	47.6
Netherlands	27.2	29.7	29.4
New Zealand	27.1	33.5	33
Norway	22.2	24.3	25
Portugal	32.3		35.3
Spain	34.5		31.7
Sweden	19.7	21.1	25.9
Turkey	43.4	49	40.9
United Kingdom	30.9	33.6	34.5
United States	33.7	36	37.8

Table 7: GDP per Capita (2005 International \$ PPP) Percentage Change 1980-2012

Country Name	GDP 1980	GDP 1990	GDP 2000	GDP 2012	Percentage Change 1980-2012
Australia	19786.97			35668.77	80.26%
Austria	20713.74			36200.42	74.77%
Belgium	20793.18			32639.21	56.97%
Canada	23070.4			35936.26	55.77%
Chile	5639.175			15847.55	181.03%
Czech Republic		16360.97		23814.95	45.56%
Denmark	20789.88			32363.24	55.67%
Finland	17857.73			31609.52	77.01%
France	20242.98			29819.1	47.31%
Germany	20860.68			34819.17	66.91%
Greece	17042.86			20921.93	22.76%
Hungary	11346.54			17032.56	50.11%
Ireland			33188.67	36722.89	10.65%
Israel	15027.82			27295.94	81.64%
Italy	18814.44			26310.46	39.84%
Japan	17834.51			31425.49	76.21%
Luxembourg	27622.22			65736.3	137.98%
Mexico	10253.13			13066.99	27.44%
Netherlands	22271.48			36438.32	63.61%
New Zealand	17457.59			25857.49	48.12%
Norway	26205.45			47546.57	81.44%
Portugal	12008.39			21032.43	75.15%
Spain	15368.38			26395.46	71.75%
Sweden	20495.84			34945.1	70.50%
Turkey	5986.22			13737.22	129.48%
United Kingdom	17433.1			32671.24	87.41%
United States	26085.67			45335.9	73.80%
Average	18539.19			30784.83	69.97%
Average Absolute Deviation	4547.629			8021.178	76.38%

Note: All GDPs are computed as GDP per capita in 2005 international \$ at PPP. Due to a lack of data, the percentage changes for Chile and Ireland have been computed using GDP 1990 for Chile and GDP 2000 for Ireland.

Table 8: Top Income Bracket Marginal Tax Rate

Country	1980	1981	1982	1990	1991	2000	2012	% Change
Australia		60.00%					47.50%	-20.83%
Austria	62.00%						43.71%	-29.49%
Belgium	76.32%						45.28%	-40.67%
Canada		62.78%					47.97%	-23.59%
Chile						45.00%	39.45%	-12.33%
Czech Republic					55.00%		20.10%	-63.45%
Denmark		70.00%					56.05%	-19.92%
Finland	51.00%						47.75%	-6.38%
France	60.00%						50.32%	-16.13%
Germany	56.00%						47.48%	-15.22%
Greece	60.00%						40.91%	-31.81%
Hungary				50.00%			20.32%	-59.36%
Ireland	60.00%						48.00%	-20.00%
Israel						50.00%	48.00%	-4.00%
Italy	72.00%						47.26%	-34.36%
Japan	93.00%						47.25%	-49.19%
Luxembourg	58.43%						41.34%	-29.25%
Mexico	55.00%						30.00%	-45.45%
Netherlands	72.00%						49.34%	-31.47%
New Zealand	60.00%						33.00%	-45.00%
Norway		65.40%					40.00%	-38.84%
Portugal		77.50%					43.61%	-43.73%
Spain	65.50%						52.00%	-20.61%
Sweden		85.00%					56.60%	-33.41%
Turkey			65.00%				35.70%	-45.08%
United Kingdom		60.00%					50.00%	-16.67%
United States	70.00%						41.73%	-40.39%
Mean						63.59%	43.36%	-30.99%

Data Appendix

This Appendix will explain what solutions I have adopted in order to fill some of the gaps in the data set utilized in the graphs and tables of this paper.

Table 1-6-7 and Graph 1-2-3-4-5: The measurements of inequality were not complete for all the countries in the period of the early 1980s. Therefore, I measured Australia and Chile using their level of inequality in the mid-1990s. All the data on inequality are taken from page 45 of OECD 2011 – Divided We Stand Publication. The measurements of growth as well required some substitutions because the World Bank time series “GDP per capita, PPP (constant 2005 international \$)” was not complete. In particular, Czech Republic’s early GDP value is from 1990, while Ireland’s only goes back to 2000. All the more recent values considered in the percentage change computation are from the late 2000s for the GINI and from the year 2012 for GDP per capita.

Tables 3-4-5: For measuring the expansion of the financial sector, I used the earliest available data from the World Bank’s time series “Market Capitalization of Listed Companies (% of GDP)”. For Australia, Austria, Belgium, Canada, Chile, Denmark, Finland, France, Germany, Greece, Israel, Italy, Japan, Luxembourg, Mexico, Netherlands, New Zealand, Norway, Portugal, Spain, Sweden, Turkey, the U.K., and the U.S., the year is 1988. Hungary (1991), Czech Republic (1994) and Ireland (1995) required a different base year due to the lack of earlier data. The more recent year considered for the percentage change computation is 2012 for all the sample countries except Israel (2011).

For Technological Progress/Productivity, I used the World’s Bank “GDP per person Employed (constant 1990 PPP \$)” with the following distinct points in time to compute the percentage change: 1980-2011. The only exceptions are Czech Republic (1989) and Germany (2008). The German short period of time considered explains the -0.5% drop in technological progress.

For Globalization, I have used the KOF Index of Economic Globalization. The percentage change was computed using the 1980 and the 2010 values for all the countries with the exclusion of Czech Republic (1993).

International Trade was measured using Trade (% of GDP) from the World Bank’s database. The earlier year considered was 1980 for all countries except Czech Republic (1990). The later year is 2012 for all countries except Hungary (2011).

The expansion of the Service Sector was measured with the World Bank’s “Employment in Service (% of total employment)” time series. For Australia, Belgium, Canada, Chile, Finland, France, Hungary, Israel, Italy, Japan, Luxembourg, Mexico, Norway, Portugal, Spain, Sweden, the U.K. and the U.S., the base year was 1980. For Denmark, Greece, and Netherlands I adopted 1981. Turkey (1982), Austria (1983), Ireland (1983), New Zealand (1986), Germany (1991), and Czech Republic (1993) complete the sample. The more recent year used for the percentage change computation was 2012 for Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Luxembourg, Norway, Portugal, Spain, Sweden, Turkey, the UK., Canada (2008), Australia (2009), Israel

(2009), New Zealand (2009), Japan (2010), the U.S. (2010), Chile (2011), Mexico (2011), and the Netherlands (2011) required a different period frame.

For measuring International Migration, I have adopted the “International Migrant Stock (% of population)” from the World Bank’s database. The base year was 1980, the recent year was 2010. The only exceptions are Czech Republic and Germany, for which I used the bottom year 1990.

The Trade Union Density has been measured through the OECD Database on Trade Unions. The only exception was Israel (not present in the time series), for which I found the 1980 value from the 2003 paper by Cohen, Haberfeld, Mundlak and Saporta and the 2006 value from an article by Hall-Jones. For Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Ireland, Italy, Japan, Luxembourg, Netherlands, New Zealand, Norway, Portugal, Sweden, the U.K., and the U.S. the base year is 1980. Spain (1981), Chile(1986), Turkey (1986), Greece (1990), Mexico (1992), Czech Republic (1995), and Hungary (1995) all required different measurements. Regarding the earlier period, Australia, Canada, Ireland, Japan, Mexico, Netherlands, New Zealand, Norway, Sweden, the U.K. and the U.S. utilized 2011. For Austria, Chile, Finland, Germany, Italy, Portugal, and Turkey, I adopted 2010; for Belgium, Czech Republic, Denmark, and Spain, 2009; and for France, Greece, Hungary, and Luxembourg, 2008.

For College Graduates, I used the “Number of students in tertiary education per 100,000 inhabitants” from the World Bank’s database. All the countries used 1980 as the base year, with the exception of Canada (1986) and Germany (1991). For the later period of the computation, I used 2011 for Australia, Austria, Belgium, Chile, Czech Republic, Finland, France, Germany, Hungary, Ireland, Italy, Japan, Mexico, Netherlands, New Zealand, Norway, Spain, Sweden, Turkey, the United Kingdom, and the United States. For Denmark, Greece, Israel, Luxembourg, and Portugal, I adopted 2010. Canada (2010) is the only exception.

Table 8: The top income bracket marginal tax rate was measured from the OECD Tax Database, accessed from the <http://www.oecd.org/dataoecd/44/2/1942506.xls>. The base year for Austria, Belgium, Finland, France, Germany, Greece, Ireland, Italy, Japan, Luxembourg, Mexico, Netherlands, New Zealand, Spain, and the United States is 1980. For Australia, Canada, Denmark, Norway, Portugal, Sweden and the U.K. is 1981. Turkey (1982), Hungary (1990), Czech Republic (1991), Chile (2000), and Israel (2000) complete the sample. For the later period, I adopted 2012 for all the countries.

Acknowledgements

The author is grateful for the help and guidance of his advisor Professor Robert Moffitt throughout the writing of this paper. Thanks is also due to the OECD Washington Center for providing useful data on inequality and to my parents, for supporting me unconditionally during my three years at Hopkins.

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