Globalization and between country Inequality

Testing the impact of globalization on income inequality

between countries

Erasmus University Rotterdam

Erasmus school of Economics

Department of Economics

Supervisor:

Dr. E.O. Pelkmans

Name: J.P. Hagenaar

Studentnr.: 295339

Email: 295339jh@student.eur.nl

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Jimmy Hagenaar

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1. **Introduction**

**1.1 Inequality in the globalization era.**

Globalization and inequality are subjects, which have been widely debated in international literature. Globalization is already broadly accepted and rapidly growing. According to Thomas Friedman (2005), globalization had made the world flat. The relative distance between countries is decreasing because of technical innovations and the growing level of information exchange.

Inequality in economics commonly refers to income inequalities. There is a distinction between income inequalities within and between countries. A downside of inequality is the fact that it compares data and generates a relative outcome. For instance, high income inequality in a country does not automatically mean high poverty rates and vice versa. However a high income inequality supports the recognition of problems in society, meaning there is an unequal distribution of income and a higher possibility of inhabitants living below the set poverty line. Another point of notice is the fact that income inequality doesn’t include utility. This point is emphasized in the article “The new (improved) Gilded age” (the Economist, 2007). The staggering price difference between an $11000 “Sub- zero PRO 48” and a $350 IKEA refrigerator is immense, but they both cool properly. So, preference wise two families owning one refrigerator can be evenly satisfied, because of different preferences and standards. Inequality as a tool to compare countries has a number of uses. Inequality shows relative differences between several countries and inhabitants within those countries. Empirically, there is a debate if global income inequality is decreasing or not in the last decades. Un-weighted measures show that inequality is rising, but weighting for population points to the opposite. This is driven by China, since they are a big part of the world population. What determines global convergence or divergence? China for instance shows rising income inequalities within its borders, but on the other hand it is driving force in convergence between countries. Sala-i-martin (2006) and Bourguignon and Morrison (2002) find that inequality between countries are more determinative in global income differences. So, the difference in income between two random world citizens is driven for a larger part by convergence or divergence between countries than by income differences within countries.

Studies on the actual impact of globalization on inequality between countries are still inconclusive. The standard Heckscher-Ohlin and Solow models support global convergence. The neo liberal argument says that global incomes have converged. These progressive trends are due in large part to the rising density of economic integration between countries. Wade (2004)

Another point of interest in the discussion of globalization versus inequality is whether countries are able to transform themselves over time. Do countries catch up or is the gap between low/ middle income countries and rich countries becoming larger? To answer this question, it is required to test the countries individually and in clustered groups. Thus, the present study will contribute by examining inequality between countries using a globalization indicator.

**1.2 Research question**

Globalization and income inequality are two subjects that have been thoroughly analyzed separately, but the simultaneous relationship is still inconclusive. The present study aims to test it simultaneously by taking the development of inequality into account, as well as globalization over time.

Research question:

*What is the impact of economic globalization on income inequalities between countries?*

As mentioned before, inequality is a relative variable. Thus, an increase in inequality does not mean the end result is negative. State for example that the US is the only country with a positive growth rate. Although all other countries are not worse off by this event, inequality will worsen. The objective of improving equality is one in which all countries benefit and move closer to each other. The starting position of a country is important in assessing the effect on inequality. When a country with an above average growth rate is positioned below the world average income; inequality will decrease over time.

The impact of globalization on income inequality between countries is an interesting topic in the international debate. First and most important, the study will contribute to the discussion about the determinants and effects of globalization. The study will provide insight on whether more globalization leads to income convergence or divergence between countries.

**1.3 Outline**

In the first chapter an introduction of the main topics and the research question will be stated. Chapter 2 will contain a review of the literature. Chapter 3 will start with developing the theoretical framework. Theoretical models explaining the effects of globalization on income inequality and growth of countries will be presented. This will contain standard models that support globalization effects and growth models. Subsequently, hypothesizes will be formed out of assumptions concerning the existing literature and theoretical framework. In chapter 4, the model, variables and method will be formulated and described in detail. The calculation methods of the main variables will be explained in order to test them in chapter 5. Chapter 5 contains a descriptive and regression analysis of the models. Next to that, a threshold analysis is performed to highlight countries that catch up fast and to provide insight in individual movements. Finally, chapter 6 will hold the conclusions of the thesis.

**Theoretical Framework**

**2. Globalization and Inequality in the international debate**

**2.1 Literature review**

The classical economic view implies that international trade increases welfare. An argument against international trade and globalization is that it creates larger income gaps between countries. A reply is that it is technology that explains inequality and not globalization itself. The demand for skilled labor increases when R&D is focused on technological innovations. More demand leads to an increase of wages for skilled labor over unskilled labor and to an increase of income inequalities. Card and DiNardo (2002) explain the problems in the SBTC hypothesis. They find that the evidence linking rising wage inequality to skill biased technical change is surprisingly weak. Rodrik (2000) argues that protestors define globalization in such a way it has little or nothing to do with how economists would define it. The definition of globalization encompasses Foreign Direct Investments (FDI), declining barriers to trade, technological transfer, capital flows and migration, among others. In most studies one or more variables are used to form a globalization indicator. This may lead to mixed results.

Liberalization and economic openness generally induce a temporary, but possibly long-lasting increase in growth. The faster a nation improves its degree of economic freedom, the higher are the chances for a faster growth rate (De Haan and Sturm, 2000; Doucouliagos and Ulubasoglu, 2006; Gwartney and Lawson, 2004; Gwartney, Holcombe and Lawson, 2006; Liu, 2007; Feldmann, 2007). Winters, et al (2004) surveys the literature on trade liberalization and economic growth. He finds that for a variety of reasons, the level of proof is weak but there is more evidence that favors a positive relation between economic openness and economic growth.

Studies in which globalization is defined as capital account openness, are inconclusive. Alesina et al. (1994) found, testing OECD countries, that capital account openness has a positive but insignificant effect on economic growth. The study was based on cross section comparison testing short term effects. Rodrik (1998) shares doubts on the effects of capital account openness on growth. His sample includes almost 100 countries. The results show an insignificant effect of capital account openness over the period 1975 to 1989. Hermes and Lensink (2003) test financial integration and growth differently. They calculated a threshold at which countries can enjoy the growth benefits of FDI. They find that almost all the countries in sub-Saharan Africa don’t meet the threshold. These countries are unable to benefit due to their weak financial system. Kose et al (2006) surveys the empirical studies on the benefits and costs of financial globalization for developing countries. They believe international comparison is dubious, because it is hard to capture the extent of a countries’ integration into global financial markets. Chanda (2001) shows that capital control has a significant effect on economic growth. He points out that the degree of heterogeneity of ethnic backgrounds in society decides the positive or negative effect of capital controls on economic growth. During 1975-1996, 39 of 57 non-OECD countries saw a negative effect on their growth rates. The above results show that there is no clear effect because these effects are conditional to all sorts of threshold effects.

Defining globalization as FDI is another indicator to find effects on economic growth. Blomstrom et al. (1992) find a significant positive effect of FDI on income growth rates. The results add that inward FDI leads to higher growth rates for countries which are already developing at a high rate. Garrett (2001) confirms this by comparing different categories of countries. Low wage countries grow considerably slower than middle and high income countries in the 1990s. Furthermore, he finds that the middle income growth rates are slightly higher than high income countries, but the difference is very small. Carkovic and Levine (2002) reassessed the relation between FDI and economic growth. They used (OLS) regressions on panel data with one observation per country over the 1960-95 period. The conclusion implies that FDI doesn’t have an independent influence on economic growth.

A more comprehensive way of calculating globalizations effects is to combine indicators. This is done by Deher (2006). He made a distinction between economic, political and social globalization. Dreher argued that studies using a cross section approach lead to reverse causality due to an inadequate control for endogeneity. The separate indicators of globalization show high correlation. Aware of the shortcomings of the cross section approach Dollar and Kraay (2001) tested globalization using panel data. They find evidence that opening up to the international market by trade-liberalization has a positive correlation with faster growth, but there are many critics on this.

In sum, globalization has positive effects, but the way globalization is measured is of importance when testing for effects of globalization on growth/inequality (Li, Squire and Zou, 1997); (White and Anderson, 2001) and (Garrett, 2001).

The way income inequality is measured and in which timeframe it is tested is important in interpreting results. Global inequality worsened from 1820-1992(Bourguignon and Morrison, 2002). However, in a recent timeframe, global incomes converged 1962-1998 (Melchior and Telle, 2001). There are different ways of calculating global income inequalities. Adding weights to the size of populations can change the results completely. The influence of population size is eliminated when counting each country as one observation. This eliminates the influence of China and India as two highly populated countries which grew immense during the last decades. Global inequality declines more or less since the late 1960, but when excluding China it does not (Melchior, 2001). Jones (1997) treats countries as one vote per country. He finds convergence towards more high income countries and fewer poor countries. He adds that when you weigh, the results will be strengthened due to the fact that China and India account for almost 40% of the world’s population. Another way is to address income inequality in relative or absolute numbers. Ravaillon (2004) states that when two households earn US$1000 and 10000$ and you double their income, the relative gap is the same, but in absolute terms the difference has doubled from 9000$ to 18000$. Furthermore, he explains different ways of calculating income inequalities. This is also the basis of the critics on Dollar and Kraay’s results on trade and inequality.

In general, the main view is that income inequality between countries is decreasing. Barro (1997) constructed a panel of 100 countries from 1960-1990 that support conditional convergence. He states that the growth rate is positively related with numerous variables such as higher initial schooling, lower government consumption and improvements in the terms of trade. Dowdrick (2005) sums that when using a fixed-price method of calculating PPP incomes; income inequality tends to fall during the 1980s and 1990s. However, he also states that when using a market exchange rate comparison of income; inequality increased. These findings are on average suggesting convergence but also other observations can be found that point otherwise (Pritchett, 1997). Firebaugh (1999) suggests that inequality between countries worsened from the Industrial revolution onwards, but stabilized in the last decades. He finds that the direction of the current trend depends on the change in income inequality in the average nation. Heshmati and Lee (2010) use 13 globalization indicators to form one single composite index. They find a negative association between globalization and inequality. Bourguignon et al. (2004) find no Pareto improvement during 1980 -2002 when giving every country one vote. When the findings are corrected for population weights, Pareto improvement can be interpreted. Quah (1993) produces robust characterizations of the tendency towards a two-world camp, dividing rich and poor countries. He includes that the probability of escaping the low wage camp is slim in the short and long run.

Mazur (2000) emphasizes globalization holds dramatic effects for poor countries. He argues the effects have marginalized the poor and left poor countries behind. His arguments are based on descriptive analysis on income inequalities. He finds globalization to have destructive effects in countries that lack labor unions. Heshmati (2003) finds economic integration has increases inequality, but his findings explain only 7 to 11 percent of the casual relation between income inequalities and globalization. His regressions are based on two composed indices of globalization. Harrison and McMillan (2007) conclude upon their collected evidence, that globalization produces both winners and losers among the poor. The fact that some poor individuals are worse off by trade or financial integration, asks for policies that prevent dramatic drops in welfare for individuals. Solimano (2001) tested globalization amongst western European countries. He found considerable convergence among western European countries and a decline in the GDP per capita income gap between the richest and poorest regions. Wade (2004) reviews inequality and globalization separately in order to make statements about them. He reviews that several studies using different measures point to a conclusion of widening inequality since around 1980, despite China and India’s fast growth. Absolute income gaps are widening and thus we cannot conclude globalization is moving us in the right direction. Firebaugh (2003) argues that globalization probably affects inequality between countries, but because of different reasons generally stated. He argues that it is basically due to the spread of industrialization in Asia rather than due to post-industrial technology in the west. Moreover, Firebaugh concludes that global inequality and globalization did not rise simultaneously. So in his view the claim that globalization increases inequality doesn’t hold.

The effects of globalization on inequality aside, the question whether countries are catching-up remains. The movement of inequality is the most important factor in this. International literature concurs about a so-called middle income trap. To tackle this problem proper governmental guidance is needed to transform and absorb technology. Ohno (2009) describes the development of a country in stages in order to explain the development of ASEAN countries. After stage 2 he describes a glass ceiling that prevents countries developing to stage 3. The step from being under foreign guidance to stage 3; “internal management and technology mastered” requires major revisions of the economy. He states that value creation must be enhanced and that proper government guidance is needed rather than laissez-faire.

In sum, the impact of globalization on income inequality between countries is still inconclusive. The literature review shows that measurement- and time decisions are important. Changing the timeframe or adding weights to population can easily alter the findings. The literature shows that the topic is relevant, because the debate between optimists and pessimist will go on. The present study will contribute by introducing a two-side statistical comparison. The scope of the study will follow the development of inequality and globalization simultaneously

**3. The impact of globalization on inequality between countries**

**3.1 Introduction**

Globalization has effects on a wide range of economic indicators and is often referred to in the area of trade and growth. There is an indirect effect of globalization on income inequalities. The results of globalization on inequality are not always the same, because different calculation assumptions result in different outcomes. In this chapter the theoretical framework will be introduced. Globalization will be described with basic economic models and it will be linked to inequality between countries. Furthermore, the hypotheses of the study will be introduced as well as their relevancy to the research question.

**3.2 Globalization**

Globalization is a broad phenomenon affecting almost all dimensions of society. The study focuses on economic globalization. One of the most famous models is the Ricardian framework of comparative advantage. In that model specialization enlarges the possibilities to gain from international trade (Bowen et al, 1998). The basic Ricardian model rests on several assumptions. These are extended to a more detailed and comprehensive model by adding economies of scale, labor migration and other considerations. Nevertheless, the strength of the Ricardian model remains in the comparative advantages, occurring by specialization.

The Heckscher-Ohlin proposition states that countries with identical tastes and whom are using two factors of production, will export the good in which an abundant factor is used more intensively. This means that a country should export the products in which it has a comparative advantage through specialization and when the factor combination is in line with the availability and the relative abundance of that production factor. This is the case when observing the sum of all individual entrepreneurs and companies which optimize profits. They make individual decisions based on imperfect information and their entrepreneurial risk taking profile.

Globalization is a dynamic rather than a static process. Growth models give insights in the basic determinants for long term economic growth. When using the basic Solow formula, the derivative shows that an economy grows over time when the population increases (Sorensen et al., 2005). The basics model can be extended with technology. The economy then grows not only by an increase in population but also by the development of knowledge. The factor knowledge can be split into the development of R&D investments and the other more detailed specifications. This model can be infinitely extended with savings, investment, depreciation, external shocks, consumption, taxation etc. In sum, the developments of the mentioned factors are the building blocks of growth.

According Solow growth theory and the Ricardian model, long term economic growth is reached when a country focuses on the development of factors in which it has a comparative advantage. As mentioned before, globalization is ongoing process. Globalization is a result of international trade, but also a force that enhances it.

To sum up globalization, different views and approaches are important to fully capitalize and understand the phenomenon. The aim of this study is to provide more insight in the discussion.

**3.3 Inequality and globalization**

The dependent variable in the study is inequality between countries. The inequality concept is basically a measurement tool to analyze differences between countries. Inequality between countries is not something of the last decades. It is a process which started ages ago, but in the last century an increasing awareness occurred, especially in the context of rich versus poor. The focus in trying to decrease poverty is also on increasing living standards, based on humanitarian goals. Goklany (2007) finds that living standards, in the form of life expectancies, infant mortalities, health and child labor rates, are higher than they were in the past. Developing countries take advantage of the technology of developed countries, leading to an increase in welfare, measured in health and labor standards.

Globalization leads to a spread production process over multiple countries in order to minimize the costs of factors, such as labor and capital. Arndt (1997) suggests that a higher degree of integration in two countries can lead to a raise in workers’ living standards in both countries. The performances of multinational firms exceed that of home-based firms. Ramstetter (1999) finds evidence for this by comparing the value-added per employee of foreign owned firms to that of home-based firms in ﬁve East Asian countries. Griffith and Simpson (2001) support this. They find that gross value-added and labor productivity are higher in foreign-owned manufacturing enterprises in the United Kingdom in 1980-1996. Thus, globalization leads to an increase in wages in developing countries receiving FDI and the value-added is higher per worker for firms that invest in foreign plants/firms. What does this tell about income inequality between countries? Income per capita is likely to increase due to globalization effects, but the absolute income differences between host and investing countries may increase as well, due to the fact that profits are owned by the investing countries, which are in most cases developed countries.

Differences in opinions findings about the effects of globalization on inequality between countries are measurement related. First, the time-frame of the collected data is important. Looking for instance at the last decades, shows a different picture than when you take data from the start of the industrial revolution. Other issues can occur when using groups of countries or observing countries separately. Inequality as an analytical tool is very sensitive for ‘manipulative’ research. For instance, when taking today’s poorest countries as a group, it will seem as if inequality has increased. On the other hand taking Asian tigers as growth group, the conclusion would be very different. Therefore, this study uses almost all countries and analyzes from the start of where globalization starts to kick off.

The main argument for pro- globalizers is the fact that globalization leads to tougher competition. Some sectors will gain and some will lose, but in the end tougher competition will lead to faster changes in factor development and thus it increases welfare. This still doesn’t predict the movement of inequality or the effects of globalization on that movement. O’Rourke (2001) argues that static growth theory predicts convergence but conclusions based on dynamic growth theory are still ambiguous. He points out that the relationship between globalization and between country inequality can only be resolved empirically. In sum, theory predicts expectations that globalization leads to an overall result of convergence across countries. Therefore, H1 states:

H1: An increase in economic globalization leads to a decrease in inequality between countries.

Globalization affects more aspects than just economic globalization. Undeniably, political- and social globalization are not just byproducts of the economic globalization. Cerny (1997) describes what he calls a “quasi-enterprise association”. The transformation of a state into a competition state lies at the heart of political globalization. In most cases an economic incentive is dominant, but economic decisions can lead to political effects. Political globalization is driven by creating the playing field for politics in the competitive world market. This study expects political globalization to have a similar negative effect on inequality as economic globalization. Social globalization promotes economic integration since it lowers cross- border transaction costs. Information is accessible worldwide which implicates a decline in geographic distances (Mayer-Schoenberger and Hurley, 2000).

H2 is in line with the central hypothesis. Political decisions and social development, with increasing communicational and technological possibilities, lead to more interaction between countries. Therefore same as economic globalization the study expects a positive effect on equality.

H2: Both social and political globalization lead to a decrease in inequality between countries over time.

The basic Solow growth model shows that the growth of the population is important in the process of long term growth. A country with a production function of capital and labor, will grow along the growth of labor; setting capital and technology as fixed factors. The derivative in the basic Solow growth formula of labor in that case is the labor force i.e. the population.

Y=output K= Capital A= Technology, L=labor and t =time (3.1)

Ḷ=growth of labor n=growth in population (3.2)

In the real world, India and China have shown an impressive economic growth rate over the last decades. The population of China and India grew faster than in most other countries. India but especially China, are already huge economic entities which are of influence in international economics.

The potential of the domestic market is mainly determined by the size of the population. Streeten (1993) discusses the disadvantages of small countries. A large country has a more diversified economic structure than a small country. A small domestic market may not be large enough for the optimal scale of mass production. This means that firms can’t fully expand and benefit from scale effects unless they trade internationally. So, international trade is the only way small countries can take advantage of economies of scale.

The Lorenz curve of the world in figure 2[[1]](#footnote-1) shows an expected increasing and convex curve. 50% of the world population earns less than 20% of the combined GDP. Inequality decreases when comparing 1962-2007. The Lorenz curve is not representative for individual countries because of its cumulative character. It can’t be judged how individual countries perform over time. China for instance has a large population compared to other countries, but the effect of this individual country over time is not visible in figure 2. This effect can only be observed if China is extracted. The extraction of China is shown in figure 3. Inequality in this figure hardly changes. This shows the importance of large countries in calculating inequality using a Lorenz curve.

Figure 2: basic Lorenz curve

Source: own calculations based on World Penn Tables

Figure 3: basic Lorenz curve excluding China

Source: own calculations based on World Penn Tables

The Solow model shows that an increase of the population leads to growth. Countries with a fast growing population are expected to perform better in the model. In practice, the growth of the population for low wage countries can also be a burden. Resources are largely used to support and provide for the population rather than used to increases the volume of the economy, but on average the effects are expected to be positive. Hence, H3 states an increase in the relative population size leads to a decrease in inequality between countries over time.

H3: An increase in the relative population size leads to a decrease in income inequalities between countries over time

Government intervention is a much debated point for economists in the road to economic success and welfare. In theoretical models, taxing leads to a distortion of the actual equilibrium. In the actual economy one might debate this, because utilization wise a country can be better off given all inhabitants preferences. The purposes of government expenditures are in most cases expenditures to divide, create, support, control and build the economy. Why didn’t African countries benefit from globalization? Collier (2007) offers a plausible explanation. He finds that 75% of the poor people live in countries which have suffered from civil wars or long periods of bad governance and poor economic policies. An increase in government expenditures is an investment in the economy. On the international market governmental decisions are also important in legislation which has influence on the competiveness. Corruption and weak institutions have a negative influence on the growth pattern of poor countries. So, for these countries an increase in government expenditures leads to a better base for growth and thus higher growth rates in the long run. Governmental expenditures are expected to decrease inequality between countries.

H4: The relative size of Government expenditures to GDP has a negative effect on income inequalities between countries over time.

**3.3.1 Catch up phenomenon**

International literature shows that middle income countries are struggling to make the final step towards becoming a high-income country. The general structure of the economy should be drastically changed in order to compete with rich countries. Middle income countries are ‘trapped’ in their development by the economic structure. Therefore, the gap between middle and high-income countries is expected to be stable or even increasing. Garret (2004) describes that only rich and low income countries have benefitted from globalization. Countries that have globalized the most have fared the worst. Therefore, this study expects a negative effect of globalization on the catch-up of middle income countries.

Low wage countries are competitive because they use widely available technology to do routine tasks at low costs. Labor abundance leads to low variable costs for companies investing in labor-intensive goods. The increased production and employment opportunities lead to an increase in welfare for these countries.

H5: Globalization shows a negative effect on the catch-up of middle income countries

H6: Globalization shows a positive effect on the catch-up of low income countries.

**4. Data and measures**

**4.1 Introduction**

This study compares the movement of globalization and inequality over time and across countries. This chapter describes the data and measurement decisions of the dependent and independent variables. The obtained dataset has been built using several variables from different sources. It contains data for 130 countries over a period of 40 years. In order to test the central hypothesis, globalization is defined as economic globalization. Inequality is defined as the difference between income per capita and the world’s average income per capita. Furthermore, a catch-up factor is calculated. The movements of countries in a country group are compared with the movement of ‘rich’ countries. Multiple other variables are added to the models to control for other influences.

The research part discussed in chapter 4 is divided into three models. Model 1 contains all countries and gives the general overview of the relationship between the variables. Model 2 and 3 focus on whether middle and low income country-groups are catching up to the richest part of the world. Model 2 centers on middle income countries and model 3, on the low income countries. The size of the groups for model 2 and 3 are determined by a benchmark created by the World Bank. The top 25% of all countries are perceived as the rich countries. The bottom 30 percent are low income countries, meaning that 45 percent are middle income countries (Garrett, 2004)[[2]](#footnote-2). This benchmark is used to construct the groups of countries, with 1987 as base year.

**4.2 Variables of the model**

**4.2.1 Dependent Variable(s)**

The dependent variable in the study is inequality between countries over time. In most studies the variable inequality is measured as either income differences between countries or as a specific inequality quotient like the Gini coefficient. This study calculates an alternative variable using the World’s Penn Tables (PWT 7.0)

The GDP per capita income is corrected by numerous welfare determinants. This results in a Purchasing Power Parities GDP per capita income which is a stronger comparative tool than GDP per capita. The constant prices PPP chain series of the PWT 7.0 dataset takes into account growth rates of each consecutive year. The respective current price component shares are used to calculate forward and backwards from the 2005 international price level.

In order to test the hypotheses the study uses data for 130 countries. The number of countries is chosen by the availability of data. The span of the countries is based on whether information is available for GDP per capita and globalization.

The Gini coefficient is not used as primary cross-country inequality indicator. The Gini- Coefficient is calculated by a formula in which the relative country position matters in calculating a country specific component. The formula has a cumulative character and this has implications for the data points. Countries shift over time to other positions meaning the component in calculating the Gini changes. The country specific component has no value over time. The Gini coefficient is a strong and comprehensive tool to address and summarize inequality, but it is more in place when calculating within country inequality. Nevertheless, the study incorporates the Gini in the descriptive part of chapter 5. This to show a general overview of inequality over time.

The main focus in the calculations is to capture inequality movement over time. In model 1 the movement is calculated as the development of the distance to the average world income. The study uses a simple formula to calculate the distance to the world average. The distance for every country above the world average income is calculated as Country income / world average income ≥ 1. The formula is inverted if the income of a country is lower than the average income: 1/ (Country income/World average income) ≥ 1. Using this method of calculating inequality leads to data points for all countries in all years and it shows the movement of income inequalities over time.

Perfect equality would be reached if every country has the value of one. There are no differences in incomes. It means that the incomes of these countries are equal to the average world income. Higher or lower incomes than the world’s average income result in a value >1. Over time this shows the movement of countries towards or away from equality.

Calculations for addressing the catch-up of country groups in model 2 and 3 follow almost the same principles as described above. The average income of the rich countries is used instead of the world’s average income. Since the interest is not to measure the incidence of catch-up, a less-than-one outcome is possible if, for instance, the income of a middle-income country increases to a level higher than that of the average of the top 25% rich economies. Some countries are catching up but in the data a value lower than one doesn’t occur. So there is not a middle income country that ends up with an income higher than the top 25% rich economies.

In sum, choosing this way of calculating an inequality indicator solves the problems occurring with using a variable like the Gini. The purpose of the study is to follow and test globalization and inequality between countries simultaneously and over time. By retrieving individual movements of countries on inequality, it is possible to compare both movements. The calculation methods are one possible way of dealing with this requirement.

**4.2.2 Globalization variable**

Several measures can be used to predict how countries interact with the world. The main independent variable used for economic globalization in the study is the economic variable of the KOF index of globalization (Dreher, 2006). The study by Dreher and Axel(2006) was updated by Dreher, Axel, Noel Gaston and Pim Martens (2008).The combined KOF index is a weighted average of three globalization dimensions, economic, social and political globalization. The technicalities and weights can be observed in appendix C.

The economic variable is a weighted average of 8 different economic indicators and is observed as a percentage. It contains indicators such as trade, FDI and trade restrictions/openness.

This study uses economic globalization as leading independent variable for two reasons. First, the economic element is leading in this study. Globalization has influence on multiple elements in society. Above all it is viewed as an economic phenomenon which affects social and other dimensions. Therefore, economic globalization should be the independent variable. Secondly, the weighting process used in the combined KOF total index is not in line with the objective of this study. Appendix C shows that the KOF total index validates 36% to the economic process and 37% to social globalization. Recalculation indicators shows that in the total index 4% is considered trade and 5 % FDI. The valuations for MacDonald’s restaurants and the number of IKEA’s are higher. So, the use of the economic variant gives a more sufficient result for what this study is aiming for. The KOF index of globalization is a renowned indicator for testing globalization effects. These established variables are widely used in studies. The economic variant is used in studies focusing on trade and foreign direct investments. The scope of the papers addressing this variable is broad. This is namely because it shows detailed information for almost all countries. This means that researchers can choose to test worldwide globalization, regional, or in detailed country effects.

**4.2.3 Other globalization variables**

Social- and political globalization are dimensions of interest in order to describe and explain globalization. The study uses the same source of data. Political globalization is measured as the weighted average of 4 variables: number of embassies in a country, number of memberships in international organizations, personnel contributed to the U.N. Security Council missions per capita and the number of international signed treaties. All four give information on the political openness of a country and the contributions to international political activities. The variable is measured as a percentage and describes to what extend a country is politically globalized. Social globalization is based on 11 different variables. Important over the recent years are the internet and social media developments. These are incorporated in the forming of this variable. The exact weights for measuring this percentage are presented in appendix C.

**4.2.4 Control variables**

In addition to the international globalization variables the study controls for other variables. First, the study controls for the relative size of the population. This variable is calculated by dividing the population with the world average population. The population constructed variable is based on information of the OECD (2011). The size and initial size position of countries should have an effect on inequality. The relevancy for a population or size effect is discussed in chapter 2. Secondly, the study controls for the role of the government. The role of the government can be examined by various different components. This study uses government expenditures as a percentage of GDP. (OECD, 2011b). The decision is based on the availability of data. The study contains 130 countries and government expenditures has less missing data points compared to more specific government expenditure data.

**4.3 Method**

To examine the impact of globalization on income inequality between countries, the study builds on a research design with a comparative nature. First, a descriptive analysis of all variables will be presented and discussed. The countries will be used to form groups to test if they catch-up. In addition, interest will be shared to compare economic globalization over time with a Penn Tables derived GINI index. Furthermore, to test the hypothesis, a number of pooled time series cross-section regressions will be run. This is based upon OLS and includes a staged adding and removal of control variables. Staging the process shows a detailed development of the relation between the independent variable and control variables. The study will follow econometric guidelines for statistical tests. The model will take fixed effects, panel corrected standard errors, Hausman test, etc. into account (Baltagi, 2008).

**5. Empirical Analysis**

**5.1 introductions**

The data models are divided in 3 models. The first model contains all countries. The second group only the middle income countries and the third group the low-wage countries. This distinction is made to show the development of the world and to see whether the initial position is decisive in the relative development of a country. Are countries catching up, left behind or simply developing at a slower rate? This will be compared with the upcoming and developing process of globalization. Furthermore, descriptive analysis is performed and a threshold analysis is added which gives insight in the catch-up progress and the robustness of the chosen country groups.

**5.2 Descriptive statistics**

**5.2.1 All countries**

Figure 4 shows the development of inequality and globalization over time. Inequality is calculated as the distance between a country and the world’s average income. Globalization is perceived as the economic globalization indicator constructed by Dreher (2006). The results show clearly the variables increased over time. Inequality between countries increases from 4.11 to 5.91 in almost 40 years and the globalization variable from 39.4 to 62.7. So, over the whole period both globalization and inequality between countries have increased. Based on this descriptive comparison a picture is drawn in which globalization is positively related to inequality. The study tests the causal relationship between globalization and inequality.

Figure 4: development of globalization and inequality

Source: own calculations

Table 1 shows the descriptive statistics of all countries. Here a few important remarks can be made. All variables have a high standard deviation. This indicates to some extend high volatility in the data and strengthens the need to form clustered groups of countries. This can also be observed in the minimum and maximum values of variables. Although the development over time is not visible in this table, an in-depth look shows similar differences.

The results show for instance that the mean of the world average income for all years and all countries is over 9000 international dollars. The maximum is about ten times higher and the minimum is almost 70 times lower. The distance between low wage countries and the world’s average income is much larger than the distance between the high income countries and the average. Analyzing the differences between the used globalization indicators show that the path and movement of the indicators are the same. This can be simply explained by the fact that the variables are all products of globalization. The main difference between economic, political and social globalization is the level of the mean. Political globalization has the highest mean, followed by economic globalization, and then by social globalization.

Table 1: Descriptive statistics for all countries

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Variable | Mean | Standard deviation | Min | Max |
| Income PPP per capita | 9259.014 | 10773.494 | 135.968 | 89814.25 |
| Distance to average(inequality) | 5.011 | 5.736 | 1.00 | 101.18 |
| Kofeconomic | 49.129 | 19.984 | 6.97 | 98.69 |
| Kofsocial | 40.116 | 21.695 | 6.43 | 94.58 |
| Kofpolitical | 57.888 | 22.756 | 5.81 | 98.78 |
| Populationsize | 37647.550 | 126662.4 |  |  |
| populationize wrt average | .999(1) | 3.319 | .01 | 31.06 |
| Gini | .662 | .013 | .632 | 0.682 |
| Government expenditures | 15.769 | 6.188 | 2.05 | 64.39 |

Source own calculations

Figures showing the descriptive overviews can be found in appendix B, table A2. Here, middle income and low wage countries are calculated and presented in similar way as in table 1. Data on correlation of variables can be obtained in appendix A, table A1.

Gini coefficient

The development of the Gini coefficient is presented in Figure 5. The development is measured for all countries over the period 1970-2009. A Gini coefficient of 0 means perfect equality and 1 means perfect inequality. The results state that inequality between countries is noticeably high. In within country analysis, in the World Development Indicators (WDI), the average Gini for OECD countries is around 0.35 and for non-OECD countries it is around 0.40 (World bank, 2009). The results for between country inequalities show a higher mean. This equals findings of Milanovic (2005) and Bourguignon and Morrisson (2002). They find a Gini coefficient between 0.64 and 0.66. The results in their study state that the income differences seem to increase over time.

The results support the findings of Sali-i-martin. Inequality shows larger differences for between country inequality than for within country inequality. This means that inequality worldwide is for a larger part explainable by between country inequalities (Sali-i-martin, 2006).

Figure 5: calculated Gini coefficient 1970-2009

Source: own calculations

**5.2.2 Clustered groups**

This section shows the descriptive results of the catch up indicator. This part examines whether middle and low-income countries catch up with rich countries over time. Figure 6 implies that globalization for both country groups shows the same movement but the initial level of middle income countries is higher. Globalization starts at 40 and reaches 65 and for low income countries it starts at 26 and reaches 46. So, globalization seems to be a process that affects all countries. Rich countries are more globalized than middle wage countries and middle wage countries are more globalized than low wage countries, but globalization increased worldwide.

Interestingly, the study finds different results when plotting the catch-up. The distance between low wage countries and rich countries increases over time. This states that given the idea that worldwide wealth increased over time; the income of low wage countries increases slower than the incomes of richest countries. The gap between the two country groups becomes larger. Descriptively low wage countries are not catching up. Middle income countries remain stuck. They don’t catch-up with the rich countries, but the income gap between the two country groups stays constant over time. This indicates evidence for the so called middle income trap as discussed in literature.

Figure 6: Development of globalization and catch-up of middle and low wage countries.

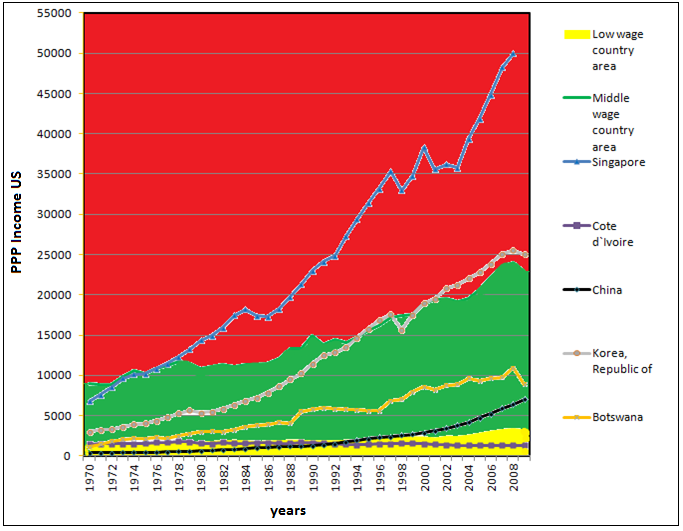
Source: own calculations

**5.2.3 Benchmark analysis of constructing the country groups**

The benchmark year in forming the country groups is 1987. This is the year in which globalization is starting to kick off and therefore in line with the goal of testing globalization on inequality. On the other hand, fact is that countries perform differently over time. Countries close to the country group borders tend to move up and down between two groups because countries are growing at different paces. Therefore, these countries are not strictly confined to a particular country group. Another possibility could be that a country performs much better or worse and therefore transform over time. It ends up in different country group as selected in the benchmark year. In this part the study shows insights in the development of country groups over time and will perform a threshold analysis for outlier countries that perform differently. The rich group in the dataset contains 30 countries. 27 countries remain it the group when checking the positions for 1970, 1987 and 2008. So 90% of the rich countries are and remain rich countries over time. When comparing 1970 with 2008 this is increased by one country adding up to 93.33%. The middle wage country group contains 61 countries. A percentage of 80.33 remains middle wage country in all three occasions. When comparing 1970 with 2008 this percentage is 86.89. For low wage countries the results show that 76.92% remains poor and 84.61% remains poor when testing 1970 and 2008.

Taking a closer look shows 4.61% of countries move from the low-wage country groups to the middle wage country group. Unfortunately, not many countries can make the leap and become rich. Only the Republic of Korea and Singapore switch from middle income countries to the group of high income countries. Besides moving to a higher position, countries move to a lower position over time as well. Around 5% moves from the middle to the low income country group and 2.3% from a rich to a middle wage income group position. Furthermore, when comparing the start point of the observations with the benchmark year we find that between 1970-1987 14.65 % of the countries move to a different country group.

Figure 7: Development of countries over time.

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**Source: own calculations.**

**5.3 Determinants of inequality between countries**

In order to measure the variations of inequality between countries, the study starts with regressing the calculated inequality indicator. This will be done by performing an ordinary least squares regression. Variables will be added in stages. Regressing the dependent variable on the one period lagged dependent variable gives a first order autocorrelations’ rho of >1. In order to deal with this non-stationarity, the study relies on an error correction model (De Boef and Keele, 2008). An advantage is that by modeling levels and first differences both short-term transitory effects as long-term structural effects can be captured. Furthermore, the model will be altered in order to capture the catch-up ratio of low and middle income country groups with respect to the richest group. These altered models are named model 2 and 3. The models correct for country and period fixed effects. This is to correct for un-modeled unit specific effects and to control for exogenous shocks common to all countries. Hence, the estimating equation of the initial empirical model is:

The results of the regression, which includes all countries, are presented in model 1. The model presents 8 regressions. It starts with testing economic globalization in the first regression. Then the model is extended by adding different variables which support and or control the main independent variable.

As hypothesized, economic globalization is negatively related to inequality. This means economic globalization leads to a more equal world. It states that an increase in economic globalization leads to a decrease in inequality between countries. The results remain significant when control variables are added. The positive coefficient for the transitory effect suggests that negative effect of economic globalization on inequality applies only in the long run. This could be understood against the background of the only marginally changing differences in inequality on an annual base.

**Model 1: Staged pooled regression of globalization on inequality between countries for all countries.**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
| **Kofeconomic(t-1)** | |  |  |  |  |  |  |  |
|  | -.003\*\* | -.002 | -.006\*\*\* | -.005\*\*\* | -.002\*\*\* | -.004\*\*\* | -.002\* | -.003\* |
|  | (-2.493) | (-1.253) | (-3.506) | (-2.858) | (-2.714) | (-2.644) | (-1.647) | (-1.642) |
| **ΔKofeconomic** | |  |  |  |  |  |  |  |
|  | .008\*\* | .009\*\* | .006\* | .008\* | .009\*\* | .008\*\* | .010\*\* | .010\*\* |
|  | (2.062) | (2.233) | (1.653) | (1.859) | (2.146) | (1.979) | (2.281) | (2.240) |
| **Kofpolitical(t-1)** | |  |  |  |  |  |  |  |
|  |  | -.001 |  | -.002\* |  | -.002\* |  | -.001 |
|  |  | (-1.118) |  | (-1.946) |  | (-1.677) |  | (-1.111) |
| **ΔKofpolitical** | |  |  |  |  |  |  |  |
|  |  | -.004\* |  | -.005\*\* |  | -005\* |  | -.005\*\* |
|  |  | (-1.779) |  | (-1.970) |  | (-1.936) |  | (-2.044) |
| **Kofsocial(t-1)** | |  |  |  |  |  |  |  |
|  |  |  | .004\*\* | .005\*\*\* |  | .004\*\* |  | .002 |
|  |  |  | (2.495) | (2.969) |  | (2.350) |  | (1.317) |
| **ΔKofsocial** |  |  |  |  |  |  |  |  |
|  |  |  | -.000 | .001 |  | .001 |  | .001 |
|  |  |  | (-.076) | (.202) |  | (.151) |  | (.238) |
| **Population(t-1)** | |  |  |  |  |  |  |  |
|  |  |  |  |  | -.216\*\*\* | -.183\*\*\* |  | -.158\*\* |
|  |  |  |  |  | (-3.505) | (-2.893) |  | (-2.441) |
| **ΔPopulation** | |  |  |  |  |  |  |  |
|  |  |  |  |  | -1.078 | -1.254 |  | -1.347 |
|  |  |  |  |  | (-1.284) | (-1.482) |  | (-1.570) |
| **Government(t-1)** | |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  | .007\*\* | .006\*\* |
|  |  |  |  |  |  |  | (2.323) | (2.058) |
| **ΔGovernment** | |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  | .015\*\*\* | .015\*\*\* |
|  |  |  |  |  |  |  | (2.824) | (2.813) |
| **Inequality(t-1)** | |  |  |  |  |  |  |  |
|  | .068\*\*\* | .696\*\*\* | .070\*\*\* | .072\*\*\* | .071\*\*\* | .074\*\*\* | .084\*\*\* | .088\*\*\* |
|  | (16.024) | (15.926) | (16.214) | (16.213) | (16.500) | (16.543) | (18.262) | (18.449) |
| Constant | -.163\*\*\* | -.140\*\* | -.179\*\*\* | -.145\*\*\* | .059 | .041 | -.379\*\*\* | -.174\* |
|  | (-3.065) | (-2.498) | (-3.346) | (-2.589) | (.708) | (.486) | (-5.143) | (-1.662) |
| Observations | 4596 | 4596 | 4596 | 4596 | 4596 | 4596 | 4208 | 4208 |
| DurbinWatson | 1.74 | 1.74 | 1.75 | 1.75 | 1.75 | 1.76 | 1.81 | 1.83 |
| Adj. R squared | .136 | .136 | .137 | .138 | .139 | .140 | .159 | .161 |

Note: OLS regression with country and year fixed effects

Absolute values of t-statistics in parenthesis

Dependent variable in the model 1-8 is a calculated inequality variable

\*\*\* significant at 1% level \*\* significant at 5% level \* significant at 10% level

The results in model 1 show contradictions between the effects of social and political globalization on inequality. This is not in line with the hypothesis 2. The hypothesis states that social- and political globalization decrease inequality. In fact, political globalization is in line with economic globalization and negatively related, but social globalization has a positive relation. The results for political globalization show a negative relation in the short and the long run. The results for social globalization apply only in the long run, since the change variable is insignificant. These results do not change when the control variables are added.

Population size is hypothesized to have a positive effect on equality. Model 1 lends support to the hypothesis in the long run. An increase of the relative population size decreases inequality between countries. Population growth is higher in below average income countries in the data. The hypothesis state that population growth in low wage countries can be a restraint to the economy and that large countries can take advantage of economies of scale. This explanation holds in the model. Since population growth is higher in below average countries the model predicts that these countries increase to benefit from economies of scale and thus move closer to the world average over time.

Government expenditures show a significant positive effect on inequality between countries in the short and long run. Government expenditures have more influence on inequality within countries, because in most countries a large part of the expenditures are to divide income amongst the population. The hypothesis describes two important points. One is the distortion of the optimal economic equilibrium. The other point is the effects of investment in institutions and infrastructure etc. which increase the base of the economy and incomes in the long run. The results show that government expenditures lead to a more unequal world. A possible explanation could be that below average income countries take less advantage of investments because the institutional fundament isn’t as strong as the higher income countries. It doesn’t disprove the need for government regulation and investments, but results show that it has lead to an increase in income inequalities between countries in the period observed.

Model 2 uses the middle wage countries as country group. Inequality is not calculated as the distance between a country and the world average, but as the distance between a country and the group of the richest countries. The descriptive statistics show the distance between middle income countries and the richest country. It remains constant over time. The regressions demonstrate a negative, non significant relation between globalization and ‘inequality’. The findings are not stable when control variables are added. The results are inconclusive.

Political and social globalization are negative and non significant in model 2. Model 1 shows a significant result for both political and social globalization. Social globalization is now negatively related but not significant. Results are not strong given the insignificance and the low adjusted r-squared. Interestingly, Model 2 shows different results for population size than model 1. It finds a positive significant relationship with inequality. An increase in relative population size of the middle income countries leads to an increase of inequality i.e. middle income countries are not catching-up. Population size is measured as the population divided by the world average population. So, an increase in the relative population size compared to the world average leads to an increase in the gap between middle and rich income countries. Moreover, this result doesn’t lend support to the hypothesis. Based on expectations, population growth should have a positive effect on growth. One explanation is that rich countries have a more effective way of using labor.

Government expenditures have a significant positive effect on the distance between middle and high income countries. An increase in the government expenditures leads to faster growth over time for high income countries. Investments in institutions and other long lasting economic standards have a positive influence in general, but the effects are stronger for high income countries.

**Model 2: Staged pooled regression of globalization on inequality between countries for middle wage countries**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
| **Kofeconomic(t-1)** | |  |  |  |  |  |  |  |
|  | -.001 | -.001 | -.001 | -.001 | -.001 | -.000 | -.000 | .002 |
|  | (-1.057) | (-.697) | (-.296) | (-.286) | (-1.073) | (-.243) | (-.438) | (.906) |
| **ΔKofeconomic** | |  |  |  |  |  |  |  |
|  | -.001 | .005 | .006 | .005 | .005 | .006 | .005 | .006 |
|  | (1.290) | (1.255) | (1.339) | (1.302) | (1.347) | (1.377) | (1.189) | (1.435) |
| **Kofpolitical(t-1)** | |  |  |  |  |  |  |  |
|  |  | -.000 |  | .000 |  | -.000 |  | -.001 |
|  |  | (-.102) |  | (.073) |  | (-.236) |  | (-.557) |
| **ΔKofpolitical** |  |  |  |  |  |  |  |  |
|  |  | .002 |  | .003 |  | .002 |  | .001 |
|  |  | (.998) |  | (1.036) |  | (.981) |  | (.627) |
| **Kofsocial(t-1)** |  |  |  |  |  |  |  |  |
|  |  |  | -.001 | -.001 |  | -.001 |  | -.002 |
|  |  |  | (-.387) | (-.390) |  | (-.248) |  | (-1.050) |
| **ΔKofsocial** |  |  |  |  |  |  |  |  |
|  |  |  | -.000 | -.000 |  | -.001 |  | -.001 |
|  |  |  | (-.0140) | (-.093) |  | (-.129) |  | (-.255) |
| **Population(t-1)** | |  |  |  |  |  |  |  |
|  |  |  |  |  | .476\*\*\* | .481\*\*\* |  | .694\*\*\* |
|  |  |  |  |  | (2.911) | (2.917) |  | (3.967) |
| **ΔPopulation** |  |  |  |  |  |  |  |  |
|  |  |  |  |  | 3.335 | 3.445 |  | 5.201\*\* |
|  |  |  |  |  | (1.284) | (1.323) |  | (1.996) |
| **Government(t-1)** | |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  | .012\*\*\* | .013\*\*\* |
|  |  |  |  |  |  |  | (3.798) | (4.224) |
| **ΔGovernment** |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  | -.003 | -.002 |
|  |  |  |  |  |  |  | (-.457) | (-.345) |
| **Inequality(t-1)** |  |  |  |  |  |  |  |  |
|  | -.059\*\*\* | -.059\*\*\* | -.059\*\*\* | -.059\*\*\* | -.062\*\*\* | -.062\*\*\* | -.052\*\*\* | -.058\*\*\* |
|  | (-8.051) | (-8.077) | (-8.031) | (-8.048) | -8.433) | (-8.421) | (-6.887) | (-7.548) |
| Constant | .390\*\*\* | .389\*\*\* | .392\*\*\* | .389\*\*\* | .154 | .155 | .135 | -.212\* |
|  | (6.350) | (6.119) | (6.354) | (6.108) | (1.527) | (1.530) | (1.618) | (-1.732) |
| Observations | 2016 | 2016 | 2016 | 2016 | 2016 | 2016 | 1864 | 1864 |
| DurbinWatson | 1.75 | 1.75 | 1.75 | 1.75 | 1.75 | 1.75 | 1.81 | 1.81 |
| Adj. R squared | .044 | .044 | .044 | .043 | .048 | .047 | .054 | .061 |

Note: OLS regression with country and year fixed effects

Absolute values of t-statistics in parenthesis

Dependent variable in the model 1-8 is a calculated catch-up variable

\*\*\* significant at 1% level \*\* significant at 5% level \* significant at 10% level

Model 3 shows the pooled regression of the low income country group. This part shows insight in the subject of inequality and poverty. Whether low income countries are catching up is an important question. This in combination whether low income countries are increasing their welfare over time. The descriptive analysis of low income countries show in fact that although welfare has increased, the gap between the group of richest countries and group of poorest countries has grown larger. This means that absolute distance in welfare increased over time.

The study expects a negative effect of globalization on the catch-up between high and low income countries. H6 states that an increase in globalization leads to a decrease in the gap between rich and low income countries. Model 3 shows that economic globalization is negative and highly significant. This is in line with the hypothesis. The change coefficient is significant positive due to marginally changing incomes on an annual base. The results don’t change when the control variables are added which means the results are robust. Opening up to the world market increases the demand for products and abundance of relative cheap labor attracts foreign investments. Although a large part of the value added is earned abroad, low income countries take advantage of the economic globalization effects. In general, low income countries are not catching up, but globalization is a positive factor in the process.

The results in model 3 for political globalization are not significant in all cases. When political globalization is added in the model at (4) and (6) the results show a significant negative relation at a 10% level. This demonstrates that an increase in political cooperation leads to a decrease in the gap between low wage countries and high income countries. An increase in political cooperation for low wage countries leads to a decrease of the gap between rich and poor countries. Social globalization is hypothesized to have a positive influence on the equalization process. In model 3 it shows a significant positive effect on the distance between low and high income countries i.e. the distance increases. Social globalization is assumed to be a side effect of economic and political globalization. The results remain robust when control variables are added and removed. Social globalization gives a ‘landlocked’ indication in the form of information. High social globalization indicates that the population is increasingly aware of what is happening outside its borders.

The results for population size effects are similar to the first model. In model 3 the effects are as hypothesized. The effects are less significant but still negative.

**Model 3: Staged pooled regression of globalization on inequality between countries for low wage countries.**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
| **Kofeconomic(t-1)** | |  |  |  |  |  |  |  |
|  | -.031\*\*\* | -.024\* | -.047\*\*\* | -.039\*\*\* | -.029\*\*\* | -.035\*\* | -.026\*\* | -.388\*\* |
|  | (-3.068) | (-1.886) | (-3.495) | (-2.749) | (-2.757) | (-2.430) | (-2.163) | (-2.050) |
| **ΔKofeconomic** | |  |  |  |  |  |  |  |
|  | .060\*\* | .064\*\* | .052\* | .057\* | .064\*\* | .061\* | .066\*\* | .062\*\* |
|  | (1.964) | (2.065) | (1.670) | (1.827) | (2.077) | (1.958) | (1.979) | (1.836) |
| **Kofpolitical(t-1)** | |  |  |  |  |  |  |  |
|  |  | -.006 |  | -.017\* |  | -.015\* |  | -.013 |
|  |  | (-.771) |  | (-1.825) |  | (-1.661) |  | (-1.220) |
| **ΔKofpolitical** | |  |  |  |  |  |  |  |
|  |  | -.025 |  | -.030 |  | -.030 |  | -.035\* |
|  |  | (-1.359) |  | (-1.625) |  | (-1.598) |  | (-1.687) |
| **Kofsocial(t-1)** | |  |  |  |  |  |  |  |
|  |  |  | .035\* | .052\*\* |  | .045\*\* |  | .047\* |
|  |  |  | (1.897) | (2.520) |  | (2.134) |  | (1.874) |
| **ΔKofsocial** |  |  |  |  |  |  |  |  |
|  |  |  | -.007 | .016 |  | .017 |  | .044 |
|  |  |  | (-.109) | (.230) |  | (.246) |  | (.584) |
| **Population(t-1)** | |  |  |  |  |  |  |  |
|  |  |  |  |  | -.716\* | -.652\* |  | -.636 |
|  |  |  |  |  | (-1.932) | (-1.753) |  | (-1.616) |
| **ΔPopulation** | |  |  |  |  |  |  |  |
|  |  |  |  |  | -2.255 | -1.048 |  | -.989 |
|  |  |  |  |  | (-.491) | (-.223) |  | (-.198) |
| **Government(t-1)** | |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  | .031 | .035\* |
|  |  |  |  |  |  |  | (1.498) | (1.662) |
| **ΔGovernment** | |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  | .094\*\* | .096\*\* |
|  |  |  |  |  |  |  | (2.481) | (2.550) |
| **Inequality(t-1)** | |  |  |  |  |  |  |  |
|  | .065\*\*\* | .068\*\*\* | .067\*\*\* | .074\*\*\* | .068\*\*\* | .075\*\*\* | .082\*\*\* | .091\*\*\* |
|  | (8.619) | (8.470) | (8.809) | (8.844) | (8.874) | (8.966) | (9.611) | (9.780) |
| Constant | -.459 | -.390 | -.689\* | -.627\* | .818 | .562 | -1.560\*\*\* | -.0372 |
|  | (-1.289) | (-1.074) | (-1.828) | (-1.661) | (1.115) | (.751) | (-2.981) | (-.399) |
| Observations | 1440 | 1440 | 1440 | 1440 | 1440 | 1440 | 1239 | 1239 |
| DurbinWatson | 1.76 | 1.76 | 1.76 | 1.78 | 1.77 | 1.79 | 1.82 | 1.85 |
| Adj. R squared | .123 | .123 | .124 | .125 | .125 | .127 | .146 | .149 |

Note: OLS regression with country and year fixed effects

Absolute values of t-statistics in parenthesis

Dependent variable in the model 1-8 is a calculated catch-up variable

\*\*\* significant at 1% level \*\* significant at 5% level \* significant at 10% level

The last variable tested in model 3 is government expenditures. This indicates that government expenditures have a positive influence on the gap between low income countries and high income countries. The result is only significant at a 10% level when all variables are included. The transitory effects are significantly positive. An increase of government expenditures by low wage countries has a positive effect on the income per capita, but it doesn’t lead to a decrease in the gap between low and high income countries. Constructive investments are important not only to achieve growth and maintain growth, but the data reveals that although this is the case high income countries benefit more from government expenditures than low income countries.

**5.4 Summary**

As the data illustrates, economic globalization has a negative influence on income inequalities between country. The models of the regressions were presented in this chapter. Model 1 shows that economic globalization is significantly negative related to the distance between all countries in the long run. This means inequality decreases over time. Results of Model 2 show inconsistency when the catch-up of middle income countries on high income countries is tested. The results are not significant when control variables are added. Model 3 is in line with the hypothesis. Globalization leads to a significant decrease in the gap between low wage and high income countries. Overall, these results lend support to the central hypothesis. Economic globalization has a negative effect on inequality i.e. it improves income equality between countries over time.

Results of testing the control variables are in most cases not in line with the expected hypotheses. Social globalization is in all cases not in line with economical globalization. Social globalization and economic globalization show effects in a different direction. Results explaining political globalization on the other hand follow predictions made in the hypotheses. Government expenditures tend to be opposite to what is expected. The result shows that relative population size has a positive significant character. This means that an increase in population size leads to inequality. The adjusted R-squared is low but the results show that the effects are of significance. This is also due to the model which corrects for serial correlation.

**6. Conclusions**

**6.1 Evidence for the impact of globalization on between country inequalities**

The impact of economic globalization has been widely recognized and discussed in economics in the last decades. Theoretical studies show that globalization leads to an increase in economic possibilities and thus ultimately to an increase in economic growth and welfare. Income inequality between countries is an interest subject to do research on too. Inequality is commonly used in addressing poverty. It is a tool to analyze income differences and an indicator in comparing economic welfare. There are many studies by renowned economists that test the two subjects. Results for inequality are affected by the way inequality is measured and in which timeframe it is observed. This has a large influence on possible outcomes. The aim of this study is to test effects of globalization on income inequalities between countries. Hence, the research question has been formulated as the following:

Research question:

*What is the impact of economic globalization on income inequalities between countries?*

Main hypothesis

*An increase in economic globalization leads to a decrease in inequality between countries.*

This hypothesis has been tested empirically using a pooled time series cross-section regression analysis. The models add and remove variables in stages. The study used data on 130 countries for the period of 1970-2009. The results indicate that there is a negative effect of economic globalization on inequality between countries. This is also strengthened by the results found for low-income countries. This shows that low income countries catch-up to rich economies under influence of economic globalization. Hence, these results are robust and consistent. The results are constantly significant for (model 1) all countries and (model 3) low income countries. The results for middle income countries are not consistent.

The results of the empirical tests are supporting studies with a positive relation between globalization and income equality. Although, the inner structure of the study is different from studies performed by economists, results are in line with others. Hence, there is evidence for a decrease in the gap between developing countries and high income countries with the addition that some are left behind (Chanda, 2001). One explanation for the positive effects is the fact that an increase in globalization leads to more trade, economic openness and opportunities for countries to use their comparative advantage. This is supported by the Ricardian, Stolper Samuelson theorem and Heckser-Ohlin propositions’. These theories show that globalization leads to more growth and that low income countries should catch-up given their potential and possibilities.

There are also studies performed which state that globalization has dramatic effects for poor countries. It has marginalized the poor and left poor countries behind (Mazur, 2000). Criticism can be jested on Mazur. Basically, he compares globalization and inequality descriptively. This leads to assumptions based on two separate developments. In the last decades inequality dramatically worsens and globalization rises immensely. This means that globalization over time has a negative effect on equality. This study contradicts this by testing the variables empirically. Regressing both variables leads to outcomes which illustrates positive effects of globalization on income equality between countries.

Another point of interest is to compare the effects of globalization on country groups. Economic globalization has a positive effect on low income countries. Results for middle income countries are different. An explanation can be twofold. Low income countries take advantage of an abundance of cheap labor. This advantage decreases when economic growth increases wages and a country develops from a low- to a middle income country. At some point, factor optimization is reached. The middle wage income trap seems to unfold. This states that middle income countries need fundamental economic changes to catch up with high income countries. The economic structure and factor use should be altered so that middle income countries can compete with rich economies rather than sideline the international market of high valued products (Ohno, 2009).

Government expenditures show evidence that it has a negative effect on equality. One of the goals of government expenditures is to improve the organizational institutional infrastructure. In other words, improve and sustain the necessary pavement on which a country can sustain long term growth. One explanation for the negative relation between government expenditures and income equality might be that the distortion costs of taxation are outweighing the benefits of investments by the government. Most poor countries suffer from a lack of efficient and honest administrations.

**6.2 Limitations and further research**

The results of testing globalization on inequality between countries show a significant relation. This does not automatically raise questions on the relevance of the results. However as mentioned before, the results concerning both subjects are very sensitive to the way variables are composed. One limitation of the study is that results are based on judgmental decisions. The results would be different if the study for example didn’t use the one country, one vote method. Furthermore, decisions are made to form country groups. A different benchmark year would change the results. The benchmark analysis shows that the country groups seem robust, but the influences of changes aren’t negligible.

The control variables have a supportive function in the study which can be improved. For instance more variables effecting inequality can be introduced and/or possible enhancements of the existing variables. Government expenditures are calculated as the overall government expenditures, but the study tries to capture expenditures that have constructive effects to the organization/institutions of a country. The amount of available data was most important.

Furthermore, the same subject can be tested with entirely different calculation methods of the variables inequality and globalization. One possibility is to strip the economic globalization indicator into its 8 variables and test them separately. Another possibility is to test the same model on different time periods. To conclude, statistically methods can be intensified by using a different testing methodology.

Nonetheless, results found in the study show evidence for a negative relation between globalization and income inequalities between countries. Policy makers should bear this in mind when making decisions on setting trade restrictions.

**Appendix A: Correlations**

Table A1: Correlations on 130 countries, 1970-2008

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | chain ppp income | distance to average | kofeconomic | relative populationsize | Kofpolitical | kof social | Government expenditures |
| chain ppp income | 1.000 |  |  |  |  |  |  |
| distance to average | -.330 | 1.000 |  |  |  |  |  |
| Kofeconomic | .700 | -.396 | 1.000 |  |  |  |  |
| relative populationsize | -.061 | .030 | -.140 | 1.000 |  |  |  |
| kofpolitical | .481 | -.211 | .386 | .130 | 1.000 |  |  |
| kof social | .831 | -.043 | .830 | .126 | .506 | 1.000 |  |
| Government expenditures | .287 | -.173 | .397 | .120 | .410 | .356 | 1.000 |

Table A1 continued; Correlations data on middle wage countries

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | chain ppp income | distance to rich | distance to average | kofeconomic | relative populationsize | kofpolitical | kof social | Government expenditures |
| chain ppp income | 1.000 |  |  |  |  |  |  |  |
| distance to rich | -.601 | 1.000 |  |  |  |  |  |  |
| distance to average | -.719 | .978 | 1.000 |  |  |  |  |  |
| kofeconomic | .433 | -.101 | -.134 | 1.000 |  |  |  |  |
| relative populationsize | -.075 | -.154 | -.129 | -.235 | 1.000 |  |  |  |
| kofpolitical | .334 | -.240 | -.224 | .163 | .359 | 1.000 |  |  |
| kof social | .689 | -.378 | -.425 | .670 | -.135 | .307 | 1.000 |  |
| Government expenditures | .115 | -.479 | .006 | .331 | -.179 | -.230 | .189 | 1.000 |

Table A1 continued; correlations data on low wage countries

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | chain ppp income | distance to rich | distance to average | kofeconomic | relative populationsize | kofpolitical | kof social | Government expenditures |
| chain ppp income | 1.000 |  |  |  |  |  |  |  |
| distance to rich | -.546 | 1.000 |  |  |  |  |  |  |
| distance to average | -.545 | 1.000 | 1.000 |  |  |  |  |  |
| kofeconomic | .465 | -.095 | -.090 | 1.000 |  |  |  |  |
| relative populationsize | .224 | -.141 | -.142 | -.042 | 1.000 |  |  |  |
| kofpolitical | .296 | .003 | .011 | .110 | .257 | 1.000 |  |  |
| kof social | .547 | -.121 | -.116 | .659 | -.060 | .154 | 1.000 |  |
| Government expenditures | .099 | -.082 | -.082 | .338 | -.107 | -.195 | .281 | 1.000 |

**Appendix B: Descriptive statistics**

Table A2: Descriptive statistics middle wage countries

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Variable | Mean | Standard deviation | Min | Max |
| Income PPP per capita | 6257.58 | 4083.148 | 1125.61 | 25539.58 |
| Distance to average | 2.176 | 1.165 | 1.00 | 7.49 |
| Kofeconomic | 49.693 | 15.412 | 13.68 | 92.36 |
| Kofsocial | 39.618 | 15.133 | 6.43 | 85.41 |
| Kofpolitical | 56.109 | 20.820 | 7.70 | 94.90 |
| populationize wrt average | .538 | .807 | .01 | 4.85 |
| Distance middle to rich | 5.618 | 3.378 | 1.38 | 19.84 |
| Government expenditures | 15.422 | 5.873 | 2.98 | 45.26 |

Table A2 continued: Descriptive statistics low wage countries

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Variable | Mean | Standard deviation | Min | Max |
| Income PPP per capita | 1138.14 | 793.961 | 135.97 | 7116.44 |
| Distance to average | 10.86 | 7.306 | 1.85 | 101.18 |
| Kofeconomic | 32.95 | 13.459 | 6.97 | 71.75 |
| Kofsocial | 20.86 | 9.282 | 6.88 | 59.46 |
| Kofpolitical | 48.17 | 20.231 | 5.81 | 92.49 |
| populationize wrt average | 1.94 | 5.746 | .01 | 31.06 |
| Distance low to rich | 29.31 | 19.728 | 4.87 | 268.09 |
| Government expenditures | 13.66 | 6.536 | 2.05 | 64.39 |

Figure A1: development of other variables

Figure A1 continued: development of other variables of middle wage countries

Figure A1 continued: development of other variables for low wage countries

**Appendix C: Technicalities concerning Kofindex**

2012 KOF Index of Globalization

**Indices and Variables Weights**

1. **Economic Globalization [36%]**

i) Actual Flows (50%)

Trade (percent of GDP) (21%)

Foreign Direct Investment, stocks (percent of GDP) (28%)

Portfolio Investment (percent of GDP) (24%)

Income Payments to Foreign Nationals (percent of GDP) (27%)

ii) Restrictions (50%)

Hidden Import Barriers (24%)

Mean Tariff Rate (27%)

Taxes on International Trade (percent of current revenue) (26%)

Capital Account Restrictions (23%)

1. **Social Globalization [37%]**

i) Data on Personal Contact (34%)

Telephone Traffic (25%)

Transfers (percent of GDP) (4%)

International Tourism (26%)

Foreign Population (percent of total population) (21%)

International letters (per capita) (25%)

ii) Data on Information Flows (35%)

Internet Users (per 1000 people) (33%)

Television (per 1000 people) (36%)

Trade in Newspapers (percent of GDP) (32%)

iii) Data on Cultural Proximity (31%)

Number of McDonald’s Restaurants (per capita) (44%)

Number of Ikea (per capita) (45%)

Trade in books (percent of GDP) (11%)

1. **Political Globalization [26%]**

Embassies in Country (25%)

Membership in International Organizations (28%)

Participation in U.N. Security Council Missions (22%)

International Treaties (25%)

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1. Figure 2 and 3 are not calculated as one country one vote. Here the total population of the world is the sum of all inhabitants of the countries involved. Important remark, it is primarily used to point out that inequality and population growth are not straightforward to decipher using basic comparative tools such as a Lorenz curve. [↑](#footnote-ref-1)
2. By actually dividing countries into country groups, the parameters chosen leave room for countries which are in practice perceived as middle wage countries but are by development theoretically more at their place as high income countries. This is further explained in chapter 5 threshold analysis. [↑](#footnote-ref-2)