Master Degree Project in Economics

Domestic Credit Supply, income Inequality, and Current Account – in Developed and Non-developed Financial Markets

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Abstract

Previous research has not econometrically, for countries with non-developed financial markets, estimated the impact domestic credit supply has on income inequality or the impact income inequality has on current account. Based on a very comprehensive panel data set, which includes 152 different countries, we econometrically estimate the impact changes in domestic credit supply has on income inequality as well as the impact changes in income inequality has on current account. Based on the econometric results in this paper, we are able to identify that the impact credit supply has on income inequality goes in opposite directions depending on if the financial market is developed or non-developed. Moreover, we were able to estimate the positive effects increased income inequality has on current account for countries with non-developed financial markets, a result previous research only has estimated theoretically.

Table of Contents

1. Introduction

Imbalances in countries current accounts have received quite some attention, especially after the great recession in 2008, but in the most recent years there seems to have been less focus on this particular issue. However, major imbalances between countries current accounts still exist although the most extreme levels seems to have declined in recent years according to the Economist. It also seems like some countries have stayed in either surplus or deficit without reversing the position. (See appendix 1)

It is important to note that even though annual current account imbalances have declined, this is not the same as to say that the imbalances have been resolved. In order to offset current account imbalances, a country that has been running current account deficits must turn these deficits into surpluses and vice versa. However this has rarely been the case and accumulated current account imbalances are likely going to increase.

Flows of capital, at least if one considers the capital flows that influence countries current accounts, do not always move in line with traditional theory such as the Solow or Hecksher-Ohlin models. Gruber and Kamin (2007) discuss traditional theories that suggest that countries with cheap labour and relatively scarce levels of capital should run current account deficits and borrow heavily against the belief of higher future income. Although, in reality they point out that this does not always seems to be the case since many developing countries export heavily and lend money to developed countries.

It is well known that the period 2006-2008 was the start of a severe global financial crisis and credit crunch; one may therefore draw parallels between the crisis and excessive current account imbalances as suggested by Kumhof and Rancière (2010). Obviously current account imbalances impact the global economy, it is therefore important to investigate the underlying factors and to look at measurable parameters that contribute to such effects. Many authors have already investigated underlying factors for current account balances and according to Kumhof et al (2012), increased income inequality in developed countries, along with liberalized financial markets

will contribute to a depressed current account in these countries. The opposite effect, i.e., current account surpluses, will take place in developing countries with poorly developed financial markets. The latter part of their theory has not yet been estimated by the use of data. Furthermore, Kumhof and Rancière (2010) highlight the empirical fact that income inequality increased and that the middle class went deeper into debt in the period before the 2007-2008 crises. A similar pattern, according to the authors, could also be identified before the great depression.

As mentioned, previous research has neither tested the effect credit supply has on income inequality nor the effects income inequality has on current account, in countries with non-developed financial markets. As a result of this lack of research, the main purpose of this paper is to estimate the effects credit supply has on income inequality and the effects income inequality has on current account in countries with non-developed financial markets and compare the results with developed financial markets. We use a very comprehensive panel data set that includes, among other variables, GINI coefficients, current account balances, and domestic credit supplies for 152 countries. This data set enables us, by the use of appropriate econometrical tools and models, to estimate if there exist differences in the effect credit supply has on income inequality and the effect income inequality has on current account, depending on if the domestic financial market is developed or not.

The main findings in this paper clearly indicates that the impact credit supply has on income inequality and the impact income inequality has on current account are very different depending on the domestic condition of the financial market, i.e., whether the domestic financial market is developed or non-developed. The fact that we derive less robustness and lower levels of significance compared to previous research regarding countries with developed financial markets strike us as no surprise, especially when consider the very large number of countries included in our sample. Moreover, the results we estimate when we run the model on countries with non-developed financial markets adds new valuable information to future research.

2. Literature review

Kumhof and Rancière (2010) highlight the relationship between an increasingly indebted middle class along with increased income inequality for the periods before the Great depression and the Great recession in the U.S. The authors use a framework which illustrates and explains how the rich upper five per cent of the population lend money to the bottom 95%, that allows the bottom 95% to maintain consumption even though their income decline. Income inequality is therefore allowed to increase in favor for the top five per cent since they collect interest payments from the money they have lent to the bottom 95%. The outcome will eventually translate into a highly indebted middle class who may find it hard to serve their debt obligations when interest rates increase. The authors find that factors such as financial liberalization is a major reason for income inequality. Kumhof et al (2013) also find strong statistical evidence for heterogeneity between high- and low-income groups, in the sense that debt/income ratios have increased more among low-income groups compared to high-income groups. Compared to Kumhof et al (2013), Atkinson et at (2009) investigate global top income shares over a very comprehensive time period instead of debt/income ratios. One of their main findings is that top income shares have drastically increased in the English-speaking world as well as in India and in China over the last 30 to 35 years. Many countries in Europe have according to the authors, except for some continental countries, also experienced increased income inequality during the same time period although not as much as income inequality has increased in the English speaking world, China, or India.

The effect income inequality has on current account however, is a research area in which Michael Kumhof has become a pioneer. In Kumhof et al (2012) they investigate the relationships between income inequality and current accounts, especially for well-developed countries such as the U.S. and the U.K. The main finding and conclusion is that increased levels of income inequality have negative impacts on current account balances. This is also proved statistically significant in their econometric results and will eventually result in major current account deficits. Furthermore, the authors argue and estimate that financial liberalization, measured by private credit provided by banks and non-banks as a share of GDP, act as an important and statistically significant negative explanatory variable on current

accounts in a sample of roughly fifteen developed countries. In addition, the authors develop a dynamic theoretical model that suggests that less developed countries, especially those countries with poor financial markets, experience current account surpluses due to rising income inequality although this is not econometrically estimated by the use of data. Chinn and Ito (2007) have a similar argument on credit supply's effect on current account. They claim that increased levels of credit supply in developed countries has a negative impact on current account and the opposite effect can be seen in developing countries.

Rajan, R.G. (2010) argues that politics, as he describes, is one of the three "fault lines" that allow for heavy credit expansion which led the World into the Great recession. Many politicians, especially in the English-speaking world, have encouraged the development of rapid credit expansion. A large proportion of the credit recipients are individuals who belong to low-income groups. It is in politicians best interest to please large proportions of the population. One potential way to do so is to compensate the people, who experience a declined income, with easy access to credit instead of a change in fiscal policies or new tax reforms. Bernanke, B. (2005) held a famous speech in April 2005 where he talked about to the "global savings glut". He discussed the capital inflow, especially from emerging countries in East Asia, into the U.S. and other industrialized countries. According to Bernanke, age demographics in the Western world suggest that these countries should be net savers and not net borrowers due to an expected rapid growth in the number of pensioners in the coming decades. Furthermore, Bernanke argues that there is a positive correlation between countries that have experienced sharp appreciations in real estate prices and countries that have experienced decreased current accounts. Other researchers that discuss capital flows from developing countries into developed countries are Chinn et al (2011). They find that a substantial share of the capital that moved into the U.S. after the year 2000 was invested in financial assets instead of invested into factories or R&D (capital investments) as used to be the case. Furthermore, the authors argue that underdeveloped financial markets in developing countries may lead to capital outflow, i.e., the developing countries may experience capital outflow due to shortcomings in their own financial markets. Moreover, in the paper the authors discuss the issue that may arise when substantial new flows of capital enter developed countries, especially the U.S., and the associated risk when the market under-prices

the risk in financial assets. It is evident that the market did in fact under-price risk, especially "mortgage backed securities" which were major factors behind the Great recession. Gruber and Kamin (2007) suggest the same regarding capital flow, as Chinn et al (2011), when they compare it to traditional theory. The traditional theory often suggest that rich developed countries send capital abroad to less developed countries due to increased returns to scale and lower costs of labour (higher labour/capital ratios). Moreover, according to this type of theory, developing countries should also borrow heavily and experience large amounts of capital inflow due to high future expected income and returns, i.e., the banks and governments in these countries should expand their balance sheets. However, empirically this does not seem to be the case since developed countries often have higher debt ratios, not only Government debts but also higher levels of outstanding domestic bank credits relative to developing countries.

3. Theoretical framework

The theoretical framework is based on the theory that Kumhof et al (2012) developed and applied in their paper "Income inequality and current account imbalances". The authors explain why income inequality and current account imbalances between countries arise by the use of a framework in which only two countries exist: Home (developed) and Foreign (developing). Home country has a developed financial market and Foreign country has a non-developed financial market. In our paper a simplified slightly modified version along with the intuition from Kumhof et al (2012) serve as the fundamental theoretical framework. Both countries, in our version of the framework, consist of Investors and Workers. Workers, who belong to the middle/low income group, represent the larger majority of the population in each country while the Investors represent the high-income minority.

Developed countries with developed financial markets generally experience negative effects on their current account as a consequence of increased income inequality while developing countries with non-developed financial markets often experience current account surpluses when income inequality increase. The main reason why the two types of countries experience opposite impacts on their current account as a result from changes in income inequality, can be explained by the differences in each

country's financial market and credit supply. The two types of countries and the different actors in each country are described in section 3.1 and 3.2.

In order to better understand section 3.1 and 3.2, it is highly recommended to look at appendix 3.

3.1 Home country (developed country)

Home investors own the banks and firms in Home country. Therefore, Home investors reap the profits from the banking sector e.g. interest paid on loans issued to Workers. Since the Investors are the owners of the firms, it is in their best interest not to raise the wages paid to Workers. It is easier for Investors to keep Home workers wages low if they provide them with credits and loans, i.e., Home investors compensate the poorly paid Home workers with an increased supply of credit and mortgages instead of increased wages. According to Kumhof et al´s (2012) theoretical framework, Home investors are assumed to be those individuals who have access to foreign capital markets. Therefore, Home investors are able to assist Foreign investors to channel their capital into the Home market. For instance, Home investors may sell mortgage-backed securities (claims on interest payments from debts issued to Home workers) to Foreign investors. Bernanke, B. (2005) refers to the "global savings glut" when excess credit supply is provided by foreign developing countries into developed countries. Moreover, Home investors are biased towards investments in financial assets rather than investing in capital assets such as R&D or infrastructure that often generate future export opportunities and long term growth.

Home workers will borrow money as a response to a declined income. As mentioned in the previous section, the wage bargaining process is easier for Home investors when they provide Home workers with credits and loans. Therefore, Home workers consumption does not necessary have to drop in line with income since some of the lost income can be offset by the use of borrowed money, a concept commonly referred to as "consumption smoothing". The reason this behaviour is possible has its roots in the financial market in Home country, which is relatively developed, liberal, and liquid.

Increased credit supply in Home country results in higher income inequality since Investors become wealthier and Home workers wages remain low or even decline.

Increased income inequality on the other hand has a negative impact on the current account in Home country since demand for consumption and imported goods are maintained or increased. In addition domestic investments are biased towards financial assets instead of capital assets that could generate export opportunities, which will negatively affect the current account.

3.2 Foreign country (developing country)

Foreign investors prefer, as a consequence of the non-developed domestic financial market, investments in financial assets abroad (in Home country). This is one fundamental reason why access to credit is scarce in Foreign country. The non-developed financial market, also referred to as "imperfect financial market", makes investments in financial assets in Foreign country risky and less lucrative compared to investments in financial assets in Home country, therefore Foreign country experiences financial capital outflow.

Foreign workers suffer from limited access to credit, since they are not able to offset income losses with borrowed money, which makes Workers very sensitive to temporary income losses. The lack of credit supply contributes to higher levels of income inequality since basic investments, in order for Workers to maintain or generate higher future income, such as medicals, education, or farming equipment, is rarely affordable. Therefore, low domestic credit supply causes income inequality to increase. The current account in Foreign country on the other hand is positively influenced from increased income inequality. The increased income inequality positively affects the current account in two ways; a low domestic demand for imported goods and the fact that the investments made in Foreign country focus on export-oriented production.

4. Data and methodology

4.1 Summary statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
Current account (% of GDP)	1635	-2.37	8.64	-84.11	39.38
Gini	1635	38.13	8.62	19.23	68.16
Log gini	1635	3.62	0.23	2.96	4.22
Level of trade	1595	90.71	56.85	18.04	447.06
Log level of trade	1595	4.36	0.52	2.89	6.10
GDP growth in %	1613	4.14	4.40	-17.95	34.50
Net energy import (% of energy use)	1306	3.45	119.07	-842.43	99.92
Credit to GDP (domestic credit provided by banks)	1567	54.98	49.93	0.80	311.06
Credit to GDP Developed Fin Mrkt	759	79.16	50.80	4.60	311.06
Credit to GDP Non-Developed Fin Mrkt	808	32.27	36.71	0.80	304.95
Credit to GDP Africa	301	17.11	15.42	0.80	84.05
Log credit to GDP (domestic credit provided by banks)	1567	3.57	1.01	-0.22	5.74
Age dependency old ratio	1618	13.36	7.58	4.29	36.02
Year	1635			2000	2013
Country	1635			1	152

4.2 Variables

Current account (% of GDP): This data is collected from the IMF's World Economic Outlook Database. This database provides balanced data that dates back to year 2000. Current account is a function of goods and services net export, net factor income, and net transfers.

GINI: In this paper, GINI is used as a proxy for income inequality where the estimated outcome is based on redistributed post tax income. The SWII database is based on 100 different GINI measures, collected from various institutions around the world, which makes it very comprehensive. By applying the intuition behind the Multiple Imputations estimate (MI estimate), the mean value of GINI for each year and country is estimated and applied throughout this paper as recommended by Solt, F. (2014) who is the creator of the SWII database. One of the main advantages of using this particular GINI estimation as a proxy for income inequality, instead of using the top one, five, or ten per cent income groups, is the outstanding large number of countries included. If the top one, five, or ten per cent income groups would be

used, instead of the GINI data applied in this paper, it would only be possible to include roughly 30 countries in the dataset.

Level of trade: The variable is composed by aggregated export plus import and it is expressed as a percentage of GDP. (Level of Trade).

GDP growth: Is the annual change in GDP in per cent. (GDP growth).

Net energy import: Energy import/export serves as an important component in countries current accounts. This variable includes all types of energy for instance oil, electricity, and natural gas. (Net energy import).

Credit to GDP: This variable describes the level of domestic credit to the private sector provided by banks. The framework applied in this paper suggests that credit supply impacts income inequality. (Credit to GDP).

Age dependency old ratio: The ratio of the population that is 64 years or older, in relation to the working population that is 15-64 years old. Walker, A. (1980) suggests that the larger the ratio of the non-working population, the larger the income inequality. (Age dependency old ratio).

Financial market: In order to get an objective opinion on whether the countries in our sample have a developed or non-developed financial market one of the components, Financial freedom, in the Heritage Foundation's Index on Economic Freedom has been used as a proxy. The Financial freedom component is mainly composed by the availability of risk spread savings, credits, payments, and investments to individuals, as well as market transparency and market efficiency. Therefore, financial freedom will work as a suitable proxy. The 152 countries in our dataset have been allocated into three different groups based on the level of financial development. Category one, countries with developed financial markets, consists of all countries in our sample (n=64) that score above a certain level (≥60) of Financial freedom in the Heritage Foundation Index. The countries in this category also have a relatively high mean value of "credit to GDP" (79,16%), i.e., the Index's classification is in line with the data in our sample. The second category, countries with non-developed financial

markets, consists of all countries in our sample (n=88) that score below a certain level (<60) of Financial freedom in the Heritage Foundation Index. Furthermore, the countries in this category also have a relatively low mean value of "credit to GDP" (32,72%) that implies, just as for category one, that the Heritage Foundation Index classification is in line with the data in our sample. Category three, African countries, only consists of African countries from our sample (n=38). The reason we create this group is due to the very poor financial markets in these countries. In addition, in order to create a more homogeneous group of countries with poor financial markets, the African countries in our sample were the best choice. Compared to non-developed financial markets, which also include most African countries, the mean value of "credit to GDP" is even lower (17,11%). The very low mean value of "credit to GDP" clearly indicates that African countries suffer from poor financial markets. (See appendix 2 for list of countries)

4.3 Econometrical model

The econometric models that will be presented in this section are designed in order to test the effects credit supply has on income inequality and the effects income inequality has on current account. As mentioned, the main idea and purpose of this thesis is to test if there exists differences in the effects credit supply has on income inequality and if there exists differences in the effects income inequality has on current account, depending on whether the domestic financial market is developed or non-developed. Furthermore, African countries have been isolated and gathered into a separate group, in addition to the other two groups where African countries are also represented, in order to represent a quite homogeneous group of countries with very non-developed financial markets.

The first econometric task is to determine what model to use. Intuition suggests that a fixed effects model is the most appropriate approach when consider that there are no time effects that varies over time, within the countries, that is not accounted for in the model. Moreover, by performing the Hausman, J.A. (1978) test on regression (a) and (b) below, a random-effect model is compared to a fixed-effect model in order to technically decide which model to use. When the test is conducted on the three different groups, the results suggest that fixed effect models should be used for both (a) and (b). The results, for all six tests, are significant at the five per cent level.

$$log(GINI)_{i,t} = \beta_0 + \beta_1 log(Credit\ to\ GDP)_{i,t} + \beta_2 Age\ dependency\ old_{i,t} + u_{i,t} \quad (a)$$

$$Current\ account_{i,t} = \beta_0 + \beta_1 log(GINI)_{i,t} + \beta_2 log(Level\ of\ trade)_{i,t} + \beta_3 GDP\ Growth_{i,t}$$
$$+ \beta_4 Net\ energy\ import_{i,t} + u_{i,t} \quad (b)$$

Second, one must identify if there are any potential threats such as autocorrelation and/or heteroscedasticity. In order to test for autocorrelation, we run the Wooldridge test for autocorrelation in panel data ("xtserial", in STATA). Based on the result for the six tests performed, which are significant at the five per cent level, one can reject the null hypothesis: no first order autocorrelation. Therefore, the data is treated as auto correlated. The second test, that controls for heteroscedasticity, is a likelihood test where the variables from estimation (a) and (b) are programmed to be homoscedastic and heteroscedastic respectively. The null hypothesis for these six tests is that the variables are homoscedastic while the alternative hypothesis is that the variables are heteroscedastic. The null hypotheses for all six tests are rejected at the five per cent level of significance and the variables are treated as heteroscedastic.

The models below, (1) and (2), are based on (a) and (b) with the exception that fixed effects are added to the models as suggested by the Hausman test. Moreover, in order to derive reliable estimates, a regular fixed effect panel data model alone is not sufficient since this model assumes that the variables are neither auto correlated nor heteroscedastic. However if cluster is used on the fixed effect models below, the previous problem of autocorrelation is accounted for and the robust standard errors manage the problems of heteroscedasticity.

$$log(GINI)_{i,t} = \beta_0 + \beta_1 log(Credit\ to\ GDP)_{i,t} + \beta_2 Age\ dependency\ old_{i,t} + \tau_i + u_{i,t} \quad (1)$$

$$Current\ account_{i,t} = \beta_0 + \beta_1 log(GINI)_{i,t} + \beta_2 log(Level\ of\ trade)_{i,t} + \beta_3 GDP\ Growth_{i,t}$$
$$+ \beta_4 Net\ energy\ import_{i,t} + \tau_i + u_{i,t} \quad (2)$$

In model (1), as previously explained, a fixed effect panel data model is applied, cluster is added in order to properly estimate the effect of "Credit to GDP" on "GINI" with "age dependency old" as a control variable. Model (1) is applied on countries with developed, non-developed financial markets as well as for the African countries as a separate group.

In model (2), a fixed effect panel data model with cluster is applied but the dependent variable from model (1) is now the main explanatory variable of interest and Current account serves as the depended variable. The control variables in model (2) are "level of trade", "GDP growth" and "net energy import". Just as in model (1), model (2) is also applied on countries with developed, non-developed financial markets and African countries as a separate group.

Other potential problems with the models, besides autocorrelation and heteroscedasticity, are the risks of two-way causality. In model (1), one could argue that income inequality may have an effect on Credit supply that could originate from populist politics as suggested by Rajan, R.G. (2010). Politicians may be tempted to liberalize the financial markets and allow larger levels of credit supply if income inequality increases, simply in order to please the population by offsetting some of the lost income with easy access to credit. Although in reality, it seems quite unlikely that income inequality per se allows for increased credit supply, but rather when credit is easily available it becomes easier for Investors, firms, and governments to reduce or halt Workers income when Workers easily can borrow the money they lost in the wage bargaining process.

Regarding the potential two-way causality in model (2), one has to consider that current account is per definition, to a very large extent, a function of net export. Whether the current account is positive or negative mostly depends on net export. Therefore, it is difficult to identify potential direct effects that current account could have on income inequality.

5. Results

5.1 Regression table

(See next page)

	(1:1)	(1:2)	(1:3)	(2:1)	(2:2)	(2:3)
	Developed Financial Markets	Non-developed Financial Markets	Africa	Developed Financial Markets	Non-developed Financial Markets	Africa
Dependent Variable	*Log gini*	*Log gini*	*Log gini*	*Current account*	*Current account*	*Current account*
Log gini				-3.397	16.992*	60.747**
Std. Err.				*(6.54)*	*(10.00)*	*(24.40)*
p-value				*(0.605)*	*(0.095)*	*(0.024)*
Level of trade				-0.004	-0.021	-0.060
Std. Err.				*(0.02)*	*(0.03)*	*(0.07)*
p-value				*(0.825)*	*(0.445)*	*(0.382)*
GDP growth % of GDP				-0.088	-0.009	0.026
Std. Err.				*(0.10)*	*(0.12)*	*(0.17)*
p-value				*(0.359)*	*(0.941)*	*(0.883)*
Net energy import (% of energy use)				0.009	-0.089***	-0.096***
Std. Err.				*(0.01)*	*(0.02)*	*(0.02)*
p-value				*(0.417)*	*(0.000)*	*(0.000)*
Log credit to GDP	0.028	-0.025	-0.042			
Std. Err.	*(0.02)*	*(0.02)*	*(0.03)*			
p-value	*(0.139)*	*(0.107)*	*(0.194)*			
Age dependency old ratio	0.003	0.005	0.019			
Std. Err.	*(0.00)*	*(0.01)*	*(0.02)*			
p-value	*(0.523)*	*(0.365)*	*(0.313)*			
Constant	3.398***	3.698***	3.790**	11.490	-64.150*	-233.687**
Std. Err.	*(0.10)*	*(0.07)*	*(0.13)*	*(23.38)*	*(36.67)*	*(97.60)*
p-value	*(0.000)*	*(0.000)*	*(0.000)*	*(0.625)*	*(0.086)*	*(0.029)*

* p≤0.10   ** p≤0.05   *** p≤0.01

5.1.1 (Regression 1:1) Credit supply and GINI for countries with developed financial markets

In regression 1:1, countries with developed financial markets, "GINI" is the dependent variable and "Credit to GDP" serves as the main regressor and "age dependency old ratio" serves as a control variable. It is not possible, with statistical significance, to prove "Credit to GDP's" effect on "GINI" although the ten per cent significance level is not that far away (p-value 0,139). What we can observe, which is very important in order to proceed with the next estimation, is that the sign in front of the coefficient is positive and considering the relatively low p-value not irrelevant.

5.1.2 (Regression 1:2) Credit supply and GINI for countries with non-developed financial markets

In regression 1:2, the same procedure as for regression 1:1 applies. Instead of estimate countries with developed financial markets, this regression only includes countries with non-developed financial markets. The negative coefficient is not statistically significant although the ten per cent significance level is very close (p-value 0,107). The negative sign in front of the coefficient along with the relatively low p-value are important observations in order to proceed with the next estimation.

5.1.3 (Regression 1:3) Credit supply and GINI for African countries

In regression 1:3, the same procedure as for 1:1 and 1:2 applies but this regression only includes African countries from our dataset. The result indicates that the "Credit to GDP" coefficient is negative, although not statistically significant (p-value 0,194). The result however, gives a good indication of the effects a declined credit supply has on income inequality.

5.1.4 (Regression 2:1) GINI and Current account for countries with developed financial markets

In countries with developed financial markets, regression 2:1, it is not possible to draw any conclusions on income inequality's effect on current account based on a p-value of 0,605. Nor is it possible to draw any additional conclusions on how current account is a function of "level of trade", "GDP growth", or "net energy import" since the p-values of the coefficients ranges between 0,359 to 0,825.

5.1.5 (Regression 2:2) GINI and Current account for countries with non-developed financial markets

In regression 2:2, instead of estimating countries with developed financial markets, this regression includes countries with non-developed financial markets. The "GINI"

coefficient is positive and statistically significant at the ten per cent level. A one per cent increase in "GINI" would increase "current account" by 0,1699 units.

The "net energy import" coefficient is negative and statistically significant at the one per cent level. A one unit increase in "net energy import" would decrease "current account" by 0,089 units. The coefficients representing "level of trade" and "GDP growth" are statistically insignificant.

5.1.6 (Regression 2:3) GINI and Current account for African countries

The "GINI" coefficient for the African countries is positive and the coefficient is statistically significant at the five per cent level. A one per cent increase in "GINI" would increase "current account" by 0,6075 units.

The "net energy import" coefficient has a negative sign and is statistically significant at the one per cent level. A one unit increase in "net energy import" would decrease "current account" with 0,096 units. Neither "level of trade" nor "GDP growth" are statistically significant.

6. Analysis of results

The signs in front of the "credit to GDP" coefficients in regression 1:1, 1:2, and 1:3 are in line with the theoretical framework in this paper. Even though the coefficients are statistically insignificant, the p-values are rather low which imply that one can still draw conclusions based on the sign in front of the coefficients.

Increased levels of credit supply in countries with developed financial markets result in higher income inequality. It is in Investors best interest to supply Workers with easy available credit. In that way, Investors are able to pay Workers lower wages as well as capitalize on interest payments from the loans issued to Workers. The result is higher income inequality, i.e., Workers income decline and Investors income increase. Investors in Home country also help Foreign investors to invest in Home country. This chain of events allow Workers to maintain consumption even though their income decline, i.e., "consumption smoothing".

On the contrary, countries with non-developed financial markets and African countries react the opposite way to changes in credit supply. In these countries, a decreased supply of credit generates higher income inequality while an increased, although relatively low, supply of credit generates a decreased income inequality. The Investors in these countries are biased towards investments in financial assets in countries with developed financial markets, which to some extent drain the credit supply in non-developed financial markets and African countries. A consequence of this chain of events is that Workers in these countries suffer from limited access to credit. This credit is needed in order to invest in products such as medication, farming equipment, and tuition fees that can prevent loss of income as well as generate short, medium, and long run income growth. For a brief visual understanding of the relationship between credit supply and income inequality, in countries with non-developed financial markets and Africa, see the graphs in appendix 4 and 5 that represent the annual mean values for the two categories. The graphs clearly illustrate that if credit supply declines the income inequality (GINI) increases and vice versa.

Increased income inequality that originates from increased or decreased credit supply, depending on the status of the financial market, has according to the theoretical framework and the results either positive or negative impact on the current account. The results derived from the regressions in this paper partly confirm this theory. For countries with developed financial markets (2:1), we fail to confirm the theory and previous research that states that these countries will experience negative effects on their current account as a result of increased income inequality. The main reason why we fail to confirm previous research is likely the very large number (n=64) of relatively heterogeneous countries in our dataset compared to previous research. On the other hand, for countries with non-developed financial markets (2:2, 2:3) we are able to confirm the theory. The results suggest that countries with very poor financial markets, such as the African countries, should experience a larger positive effect on current account as a result of increased income inequality compared to countries with less non-developed financial markets. The impact a one per cent increase in income inequality (GINI) has on current account, for the African countries, is almost four times the magnitude compared to countries with non-developed financial markets.

When income inequality increases, in countries with non-developed financial markets and Africa, Workers share of total income declines. As a result, Workers cannot afford to buy essential goods nor make investments that will generate future income i.e., a typical catch 22 situation. The increased income inequality generates low domestic demand. As a result demand for imports decline and domestic firms engage in domestic export oriented operations, factors that positively influence the current account.

The effects of energy imports behave as expected for countries in Africa and for countries with non-developed financial markets. The results imply that an increased energy import has a negative effect on current account. The magnitude of a change in energy import, when comparing the two regressions (2:2, 2:3), is in line with the intuition in the framework. The results suggest that countries with non-developed financial markets experience a lower negative effect on their current account from an increase in energy import relative to African countries. A possible explanation is that the value of the currency, in countries with non-developed financial markets compared to African countries, is slightly higher and less volatile which makes the proportional cost of energy import higher in African countries. Therefore, the negative impact on current account in African countries is higher compared to the countries with non-developed financial markets. Another reason could be that countries with non-developed financial markets, opposed to African countries, have better access to different types of financial instruments (derivatives), which could offset some of the price volatility of energy import. The insignificant result for energy import in countries with developed financial markets is disturbing. Regardless the status of the financial market, increased energy import should negatively impact the current account. However as mentioned above, access to financial instruments and higher rated currencies could make the proportional cost of energy import lower and may very well contribute to a less negative impact on a country's current account.

7. Conclusion

The main inspiration for this paper came from prominent economists like Michael Kumhof, especially his theory regarding current accounts and income inequality. We have successfully been able, even though we have made technical adjustments to

simplify his theory, to use this theory in order to estimate the effect of credit supply on income inequality and the effect of income inequality on current account for countries with non-developed financial markets. Previous literature has not yet econometrically estimated these relationships for non-developed countries, this is most likely a result of very limited access to balance data. Fortunately, we were able to access a recently published panel data set containing GINI coefficients for 174 countries. After a comprehensive search for relevant control variables, a relatively balanced panel data set including 152 countries could be formed.

Our first estimations, model (1), are conducted in order to determine the impact credit supply has on income inequality. The results are in line with the theoretical framework namely that decreased credit supply in countries with relatively poor financial markets increases income inequality. The opposite effect applies for countries with relatively developed financial markets that experience more income inequality as a result of increased credit supply. The results we receive are not statistically significant but with rather low p-values, the sign in front of the coefficients for each financial market makes it possible to draw these conclusions.

The second estimations, model (2), are conducted in order to determine the effects increased income inequality has on current accounts. According to the theoretical framework, countries with non-developed financial markets experience positive effects on their current accounts as a result of increased income inequality while countries with developed financial markets experience negative effects on their current accounts. The result for developed financial markets is statistically insignificant. For non-developed financial markets and Africa we are however able to determine, with statistical significance, the binary positive effect increased income inequality has on current account. Moreover, we are also able to determine that the more non-developed the financial market the larger is the positive effect on current account from an increased income inequality. A comparison between the two groups, non-developed financial markets and the even less developed African countries, confirms such effect.

The econometric results and data in this paper along with more balanced data in the future will definitely provide more reliable estimates within this area. The effects

credit supply has on income inequality and the effects income inequality has on current account can already, to some extent, serve as useful information for policy makers in order to reduce income inequality and current account imbalances. In our opinion an interesting future research topic, that needs more attention, will be to find an optimal level of income inequality in order to reduce the harmful global current account imbalances.

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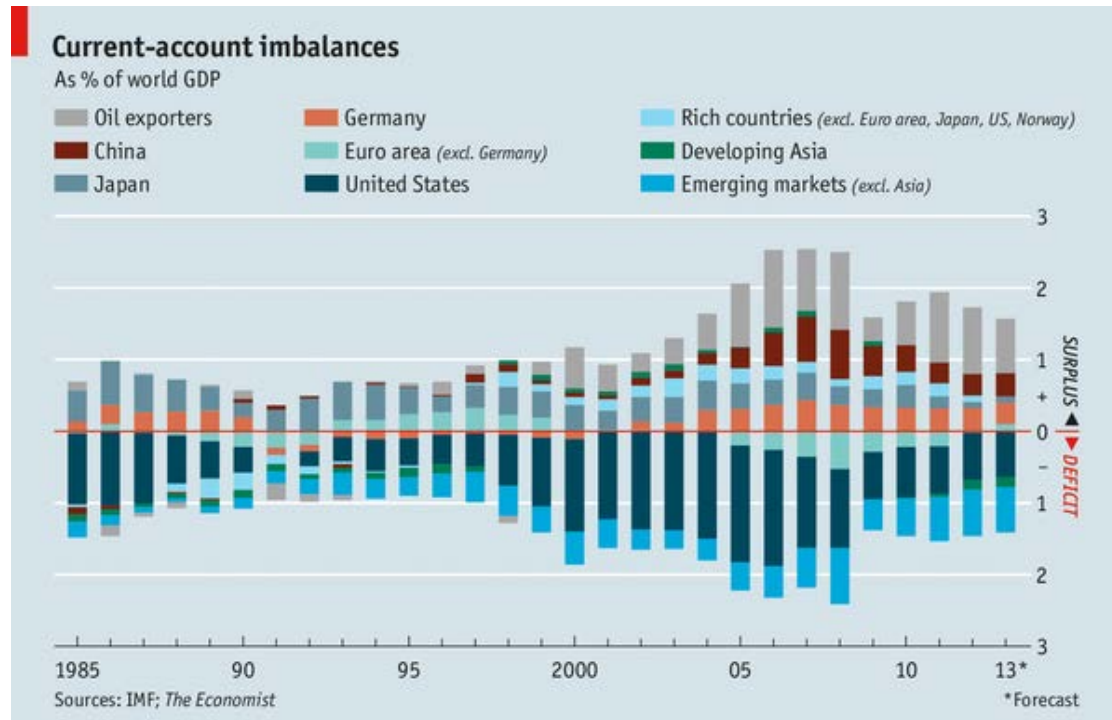The Economist (2013). "*Current-account imbalanced - Less skewed*." http://www.economist.com/news/finance-and-economics/21586838-less-skewed. Accessed: 2015-03-30.

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9. Appendix

9.1 Appendix 1 – The Economist

Current-account imbalances
As % of world GDP

- Oil exporters
- China
- Japan
- Germany
- Euro area (excl. Germany)
- United States
- Rich countries (excl. Euro area, Japan, US, Norway)
- Developing Asia
- Emerging markets (excl. Asia)

Sources: IMF; The Economist

(source: The Economist)

9.2 Appendix 2 - Categories of countries

Developed financial markets

Albania	Korea, Republic of
Armenia	Lebanon
Australia	Lithuania
Austria	Luxembourg
Barbados	Macedonia, FYR
Belgium	Malaysia
Bosnia and Herzegovina	Malta
Botswana	Mauritius
Brazil	Mexico
Bulgaria	Mongolia
Canada	Morocco
Cape Verde	Netherlands
Chile	New Zealand
Colombia	Norway
Croatia	Panama
Czech Republic	Paraguay
Denmark	Peru
El Salvador	Philippines
Estonia	Poland
Finland	Portugal
France	Singapore
Georgia	Slovak Republic
Germany	South Africa
Ghana	Spain
Honduras	Sweden
Hong Kong	Switzerland
Hungary	Taiwan
Iceland	Thailand
Indonesia	Turkey
Ireland	United Kingdom
Israel	United States
Italy	
Jordan	

African countries

Angola	Kenya
Benin	Lesotho
Botswana	Madagascar
Burkina Faso	Malawi
Burundi	Mali
Cameroon	Mauritania
Cape Verde	Mozambique
Central African Republic	Namibia
Chad	Niger
Comoros	Nigeria
Congo, Democratic Republic of	Rwanda
Congo, Republic of	Senegal
Cote d'Ivoire	Sierra Leone
Djibouti	South Africa
Ethiopia	Swaziland
Gambia	Tanzania
Ghana	Togo
Guinea	Uganda
Guinea-Bissau	Zambia
	Zimbabwe

Non-developed financial markets

Afghanistan
Algeria
Angola
Argentina
Azerbaijan
Bangladesh
Belarus
Belize
Benin
Bhutan
Bolivia
Burkina Faso
Burundi
Cambodia
Cameroon
Central African Republic
Chad
China
Comoros
Congo, Democratic Republic of
Congo, Republic of
Costa Rica
Cote d'Ivoire
Cyprus
Djibouti
Dominican Republic
Ecuador
Egypt
Ethiopia
Fiji
Gambia
Greece
Guatemala

Guinea
Guinea-Bissau
Guyana
Haiti
India
Iran
Jamaica
Japan
Kazakhstan
Kenya
Kyrgyz Republic
Lao
Latvia
Lesotho
Madagascar
Malawi
Maldives
Mali
Mauritania
Moldova
Montenegro
Mozambique
Namibia
Nepal
Nicaragua
Niger
Nigeria
Pakistan
Papua New Guinea
Romania
Russian Federation
Rwanda
Senegal

Serbia
Seychelles
Sierra Leone
Slovenia
Sri Lanka
St, Lucia
Swaziland
Syria
Tajikistan
Tanzania
Timor-Leste
Togo
Trinidad and Tobago
Tunisia
Turkmenistan
Uganda
Ukraine
Uruguay
Uzbekistan
Venezuela
Viet Nam
Yemen, Republic of
Zambia
Zimbabwe

Developed Financial Markets

⬆ <u>Increased credit supply</u> ⬆ ➔ ⬆ <u>Increased GINI</u> ⬆ ➔ ⬇ D⬚⬚⬚⬚⬚⬚
⬇

Credit is provided by domestic and Foreign investors

Workers income decline

Workers demand for import is maintained

Workers are able to borrow money to maintain consumption when their income declines

Investors income increase

Investors prefer to invest in financial assets, instead of capital investments

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Non-developed Financial Markets

⬇ <u>Decreased credit supply</u> ⬇ ➔ ⬆ <u>Increased GINI</u> ⬆ ➔ ⬆ In⬚⬚⬚⬚⬚⬚
⬆

Investors invest in financial assets abroad

Investors receive interest payments from abroad

Export oriented operations leads to more export

Limited access to credit, Workers are not able to borrow money

Workers cannot buy essentials such as; medicals, tuition fees etc.

Low domestic consumption demand results in low import

9.4 Appendix 4 – Graph for African countries

Africa
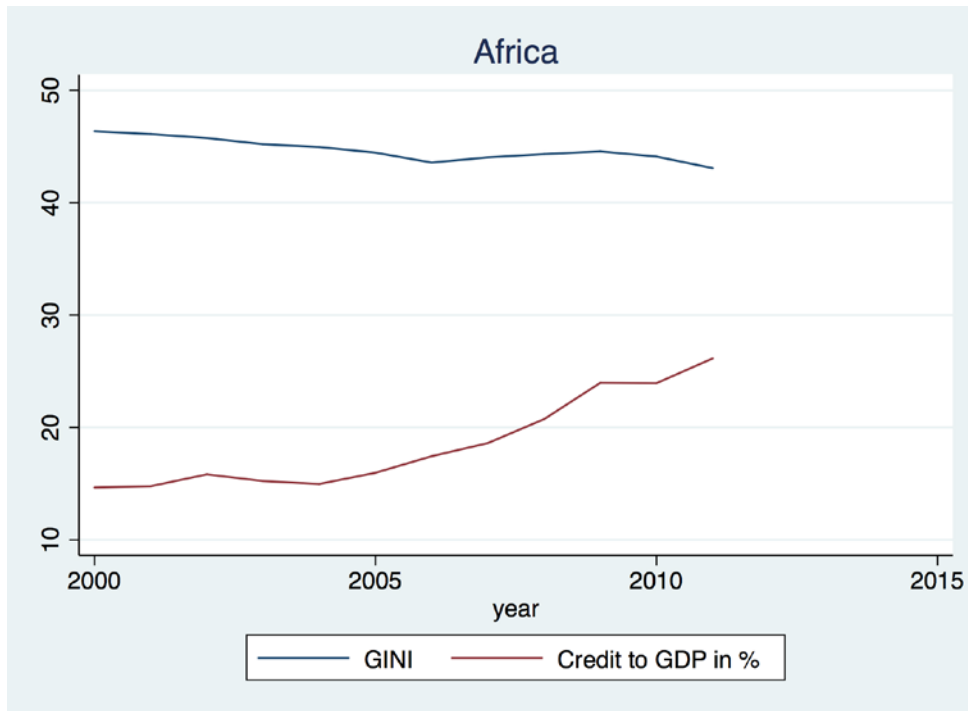
9.5 Appendix 5 – Graph for non-developed financial markets

Non Developed Financial Markets