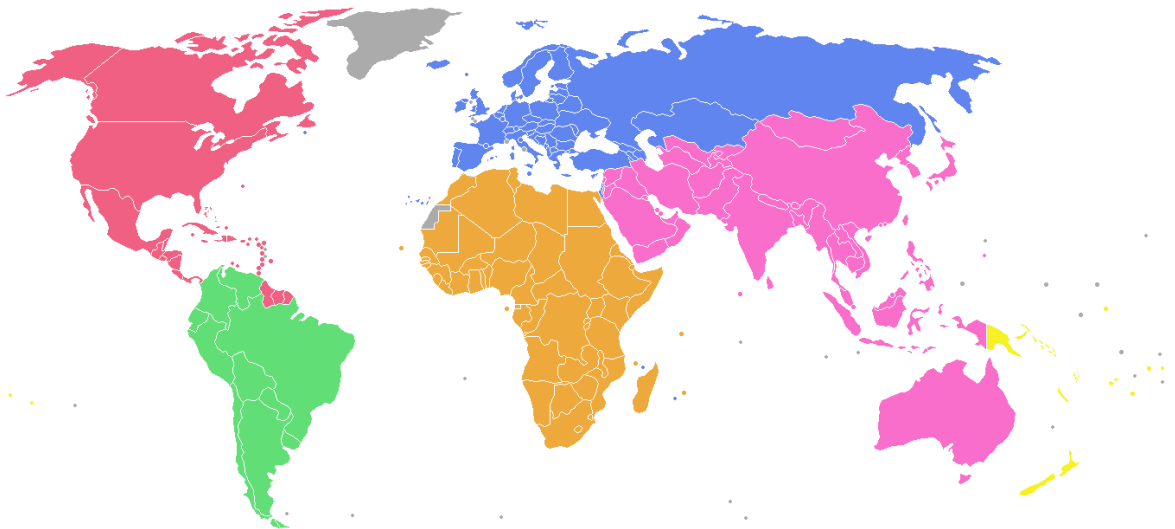




LUND UNIVERSITY  
School of Economics and Management

# The IMF and economic growth

An analysis of lending to developing countries during 1983-2010



## **Abstract**

The International Monetary Fund (IMF) is an international organization working for economic cooperation and stability. The IMF's work is aimed at both temporary credit access and structural reforms to increase economic growth. In theory, the IMF can influence economic growth via several channels. This paper identifies four; provide money through loan disbursements, work as an insurance for investors, attach policy conditions to programs and monitor the world economy. The analysis consists of a panel of 86 developing countries during the period of 1983-2010, employing both OLS and 2SLS to control for possible endogeneity in the estimations. Performing a regression analysis on the overall effect of IMF programs on economic growth, a significantly positive result is confirmed. This thesis then opens up to a new input by controlling for the effect on growth during the 1980s, 1990s and 2000s, for six different loan types and three large regions in the world. The results show a significantly positive effect on economic growth during the 1980s and 2000s. Two lending arrangements have confirmed positive effects, the Stand-by arrangements (SBA) and Extended credit facility (ECF). Finally the IMF is successful in raising economic growth in Asia and South America. In summary, this thesis concludes that the IMF is successful in promoting growth.

**Key words:** International Monetary Fund, economic growth, panel data, developing countries, macroeconomics

## Table of contents

1. Introduction .....	4
2. Definitions .....	8
2.1 The IMF.....	8
2.2 The loans .....	9
3. Descriptive Evidence.....	12
4. The IMF and economic growth.....	14
4.1. Theoretical channels of impact.....	14
4.2 The growth model .....	15
4.3 Regression results.....	17
4.3.1 Model 1 .....	18
4.3.2 Model 2.....	20
4.3.3 Model 3.....	22
4.3.4 Model 4.....	25
5. Conclusion.....	29
References .....	31
Appendix A – Summary of countries, regions and programs	
Appendix B – Tests	
Appendix C – Description of variables	
Appendix D – Descriptive data	
Appendix E – The regression results	
Appendix F – Specified regression models	

## **Abbreviations**

Following abbreviations are presented in the order of their occurrence.

IMF – International Monetary Fund

OLS – Ordinary least squares

2SLS – Two stage least squares

SBA – Stand-by arrangements

EFF – Extended fund facility

FCL – Flexible credit line

SAF – Structural adjustment facility

ESF – Exogenous shock facility

SDR – Special drawing rights

# 1. Introduction

Economic crises are not a new phenomenon in the world economy and have appeared several times during the last century. The Great Depression of the 1930s is one of the most famous ones and it led to large welfare losses. As with wars, these kinds of tragedies often lead to countries coming together to collaborate. This was the case with the International Monetary Fund (the IMF), an international economic collaboration. The aims of the IMF's work are set wide: "to foster international monetary cooperation, secure financial stability, facilitate international trade, promote high employment and sustainable economic growth, and reduce poverty around the world" (IMF 2013b).

These goals are important but not easy to achieve. In particular, given the broad reach of the IMF's work, it is important to understand its consequences on economic growth in terms of GDP per capita. Growth can be a goal in itself, as well as a measure to reach other targets. Increasing economic growth can be argued to be an especially important aim for the developing parts of the world. Notably, this made us think about the purpose of the organization and to pose the question: *does the IMF promote growth?*

One of the primary tools of the IMF to promote economic growth is to provide lending arrangements to countries. These programs offer short-term relief to countries facing balance of payments problems<sup>1</sup> or temporary crisis. Furthermore, they also offer structural support to countries whose macroeconomic policies prevent them from developing. With most programs certain policy conditions are attached and the loans are paid in instalments. This means that countries need to fulfil the predetermined policy reform criteria in order to get further instalments (Barro & Lee 2003, Prezworski & Vreeland 2000). The programs differ on the specific conditions, timing and amount of loan disbursements. However, the basic objectives of the loans are the same: to restore economic stability, since it is a necessary condition for sustained economic growth (Conway 1994, Fischer 1997).

A range of research examines if, and how, the IMF can promote growth. A summarised selection of these is presented in Table 1, containing descriptions of the studies, their methods and results. As can be seen the effect is not straightforward.

---

<sup>1</sup> Balance of payment problems occurs when a country no longer is able to meet international payment obligations (IMF 2008).

**Table 1 – Summary of earlier research**

	Positive	Negative	Sample and description of study	Method	Results
Przeworski and Vreeland (2000)		x	135 countries, during 1951-1990. Examine the effect of IMF programs on economic growth.	Instrumental variable approach to control for selection bias.	Growth is reduced during a program. After a program growth is faster, but not faster than it would have without a program.
Barro and Lee (2003)		x	130 countries, during 1975-2000. Examine factors which increase the likelihood of receiving a loan and direct and indirect effects of IMF programs.	Instrumental variable approach, 3SLS.	IMF programs have significantly negative effects on growth.
Dreher (2006)		x	98 developing countries, during 1970-2000. Examines effect of IMF programs on economic growth.	Instrumental variable approach, SUR and 3SLS.	IMF programs reduce growth, but compliance with the conditions moderates the negative effect.
Marchesi & Sirtori (2011)		x	128 developing countries, during 1982-2005. Examine the joint effect of the IMF and the World Bank programs on economic growth.	OLS and 2SLS.	The organizations together have a positive effect on growth, while IMF alone has a negative effect.
Killick et al. (1990)		x	Studied 38 programs in 16 developing countries, during 1979-1985. Examine the lagged effects of IMF programs on growth.	Before-after approach.	IMF programs have a significantly positive effect on growth after 3-4 years.
Reichmann & Stillson	x		Studied 85 programs during 1963-1972. Examine the annual growth rate of GDP before and after the introduction of a program.	Before-after approach.	In 33 of 70 cases growth increases, in 9 cases there is no change, in 28 cases growth was lowered.
Atoyan & Conway (2006)	x	x	95 developing countries, during 1993-2002. Examine effects on: growth, ratio of the fiscal surplus to GDP and ratio of the current account surplus to GDP.	Censored-sample, instrumental-variable and matching.	The results are the direct effect is weak. However, improvements are found 2-3 years after a program.
Conway (1994)	x	x	74 developing countries, during 1976-1986. Examines the motivation for participation and the macroeconomic effects.		Increased participation has a negative effect on growth. But lagged effects are positive.
Dicks-Mireaux et al. (2000)	x		74 countries, during 1986-1991. Examine the effect of IMF support on economic growth, inflation and the external debt/service ratio. Studies only ESAF programs.	Modified control-group, GEE.	Significantly positive effects on economic growth.

Much research finds a negative effect from the IMF programs on growth (see e.g. Prezworski & Vreeland 2000, Dreher 2006, Marchesi & Sirtori 2010, Barro & Lee 2003). Prezworski & Vreeland (2000) conclude that the stabilising effect obtained from the provision of money is not enough to accelerate growth. Dreher (2006) highlights the low rates of compliance with policy conditions as an explanation for the negative results. Marchesi & Sirtori (2010) argue in the same vein. They also withhold that the IMF focuses on fiscal and monetary discipline, which is argued not fitting the structurally characterised problems that the poorest countries are likely to face. On the other hand, Barro & Lee (2003) argue that growth is directly lowered by negative effects induced on investments and indirectly through lowered rate of openness and rule of law.

Reviewing the progress of the IMF programs in different regions of the world, mainly negative results are found (see e.g. Stone 2004 on Africa, Ozturk 2008 on South America, Nunnenkamp 1998, Brouwer 2004 on Asia). These negative results are explained by the poor preconditions in the regions and a lack of general support for the programs and the policy conditions. Nevertheless, there are exceptions showing that the IMF programs in general have positive effects on economic growth (see e.g. Dicks-Mireaux et al. 2000, Reichmann & Stillson 1987). While some found a lagged positive effect on growth (see e.g. Killick et al. 1992, Conway 1994, Atoyan & Conway 2006).

Based on earlier findings a relationship between the IMF and economic growth is assumed. The dispersion of earlier research on the effects on growth encourages us to examine in which way they are connected. Starting with an examination of the overall effect of IMF programs on economic growth, our aim is to determine whether the effect is positive or negative. To widen this examination a set of dummy variables is used in three additional models. The second model estimates differences between three decades: 1980, 1990, and 2000. The third model estimates difference between programs: SBA, ECF, EFF, SAF, ESF and FCL. Finally, the fourth model estimates difference between regions: Africa, Asia and South America. One type of growth strategy is to initiate economic growth with a short-term kick start of the economy, followed by long-term reforms to sustain growth (Rodrik 2003). In spirit of this theory the thesis is aimed at estimating the short-term<sup>2</sup> effect on growth.

The examination is based on a panel consisting of observations from 86 developing countries during 1983-2010. The methods of assessment are ordinary least squares (OLS)

---

<sup>2</sup> Our models consist of three equations, testing the effect on growth without any lags, with a one-year lag and with a two-year lag. Thus, the short-term effect is defined as zero up to two years.

and two-stage least squares (2SLS). In the sample, 11.63% of the countries have never received a loan disbursement from the IMF. The remaining 88.37%, consisting of 76 countries, have received loan disbursements from at least one of the six different types of programs<sup>3</sup>. In earlier research the main focus has been to answer if the IMF has a significant effect growth. Yet, no research has been found that controls for the effects on growth of the different kinds of programs, nor during the 1980s, 1990s or 2000s. This thesis contributes with an examination in these areas. Earlier research has mainly included the two most common programs: the Stand-by arrangements (SBA) and Extended fund facility (EFF) (see e.g. Barro & Lee 2003, Dreher 2006). But some researchers have compared these two programs with the Structural adjustment fund (SAF) and Extended structural adjustment fund (ESAF) (see e.g. Evrensel 2002, Evrensel & Kim 2006).

The following section provides basic information on the IMF and six different kinds of programs. Section three provides descriptive evidence of our data. Section four provides a theoretical approach on how the IMF can affect growth, our growth model and the regression results. The results are presented with a discussion on possible explanations. The final section provides a summary and some concluding remarks.

---

<sup>3</sup> This study covers Stand-by arrangements (SBA), Extended fund facility (EFF), Flexible credit line (FCL), Structural adjustment facility (SAF), Exogenous shock facility (ESF) and the Extended credit facility (ECF).



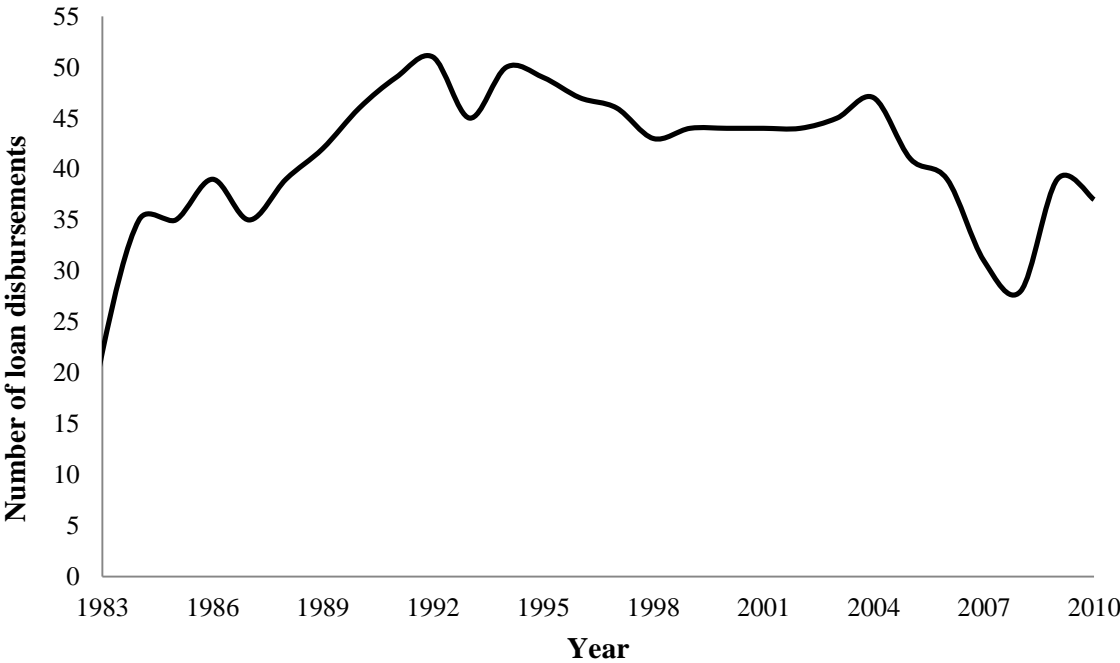
# 2. Definitions

## 2.1 The IMF

The IMF is an international organization working for economic cooperation and stability. It currently consists of 188 member countries (IMF 2013f). The organization was created in 1944 as one of the foundations of the Bretton Woods system<sup>4</sup>. The initial purpose of the organization was to guarantee the fixed exchange rates and to deal with temporary deficits through financial support (Barro & Lee 2003, IMF 2013b). The mandate of the IMF changed as the fixed gold standard was dropped. The IMF’s work expanded towards new areas (Bauer et al. 2009).

Figure 1 illustrates the evolution of the number of loan disbursements during the sampled time period 1983-2010.

**Figure 1 – Evolution of number of loan disbursements, 1983-2010**



The changes in the number of loan disbursements can be explained together with the historic evolution of the IMF. There was an upswing during the beginning of the 1980s.

<sup>4</sup> The Bretton Woods system was created to manage monetary policies and exchange rates on an international basis (Stephey 2008)

This can be explained by the emergence of the Latin American crisis in the early 1980s, coupled with the aftermath of the oil price shocks in the late 1970s (Conway 1994, Ozturk 2008). Yet, as the crisis in Mexico broke out in 1982, the IMF worked to coordinate the global response to prevent the crisis from spreading (IMF 2013l). During the 1980s the focus towards developing countries became more prominent. In addition to crisis management, longer-termed development strategies were adopted in both existing and new programs (e.g the structural adjustment facility (SAF)) (Bauer et al. 2009, Fischer 1998). The IMF's role in creating economic growth was highlighted further as the size, number and maturity time of the loans increased (Dreher 2006, Meltzer 1999).

With the fall of the Soviet Union in the 1990s the number of member countries increased. This decade is known for the outburst of financial crises in East Asia in 1997. During these crises many countries requested assistance from the IMF. However, the organization was highly criticized on its performance (IMF 2013m). As can be seen in Figure 1, the number of loan disbursements was relatively stable this decade. During the beginning of the 2000s the number of loan disbursements decreased, until the outburst of the global financial crisis in 2008. The number of loan disbursements increased rapidly and the IMF was certainly put on the map again. The lending capacity of the organization was tripled (Presbitero & Zazzaro 2012). Consequently a new lending facility, the Flexible credit line (FCL), was developed to suit the urgent economic needs in a crisis (Presbitero & Zazzaro 2012).

The main resources of the IMF come from the member states. All new members pay a quota<sup>5</sup> determined by the size of the countries' economies. Each member has the right to freely draw up to 25 % of its paid quota whenever needed. However, if more resources are needed, a lending arrangement with the IMF is required. If countries demands loans, they negotiates with the IMF and the policy conditions of the programs are decided.

## **2.2 The loans**

The IMF is an organization in constant development. New lending arrangements are developed and already existing ones are restructured. According to the IMF's Annual Report (2012), eight loaning arrangements are currently in action (IMF 2012). However, this study includes six different types of loans issued during 1983-2010. The choice of loan

---

<sup>5</sup> The quota is a member fee that is required for new member of the IMF. 25 % of this quota must be paid with the IMF's own currency called Special Drawing Rights (SDRs), while the rest is paid in the member's own currency (IMF 2013j).

types and time period was determined by the availability of data provided by the IMF for the countries included in our sample. These are Stand-by arrangements (SBA), Extended fund facility (EFF), Flexible credit line (FCL), Structural adjustment facility (SAF), Exogenous shock facility (ESF) and Extended credit facility (ECF). The programs are presented with their abbreviations in Table 2 where detailed information about the loans is provided.

The programs can be divided into two subgroups. The SBA, EFF and FCL programs are borrowed on non-concessional terms, with an interest rate based on the SDR interest rate<sup>6</sup>. While the ECF, SAF and ESF programs are borrowed on concessional terms with a zero interest rate (until January 2014). The former are targeted towards middle to high income countries and the later towards low-income countries (IMF 2013d, Evrensel & Kim 2006).

**Table 2 – Summary of loan programs**

	<b>SBA</b>	<b>EFF</b>	<b>FCL</b>	<b>SAF</b>	<b>ECF</b>	<b>ESF</b>
<b>Length</b>	1-2 years	Up to 3 years	1-2 years	Up to 3 years	3-5 years	1-2 years
<b>Repayment</b>	3 - 5 years	4 - 10 years	3 - 5 years	5,5 - 10 years	5-10 years	5-10 years
<b>Designed for</b>	Middle to high income countries	Middle to high income countries	Conditions on sound institutions	Low-income countries	Low-income countries	Low-income countries
<b>Disbursements</b>	Quarterly	Quarterly	Single disbursement	Annual	Semi-annual or quarterly	Phased
<b>Time period</b>	Short-term	Medium-term	Short-term	Medium- to long term	Medium term	Short-term
<b>Interest rate</b>	Non-concessional	Non-concessional	Non-concessional	Concessional	Concessional	Concessional

(IMF 2012, IMF 2013h, IMF 2001)

The SBA programs are designed for countries experiencing short-term balance of payment problems. These programs range between one to two years and repayments are due within three to five years (Barro & Lee 2003, Prezworski & Vreeland 2000). This type of program is aimed to restore financial confidence and stability. It can also function as a precautionary measure since countries have the option to withdraw the money if it

<sup>6</sup> The SDR interest rate is calculated every week. The rate of charge for the non-concessional loans is equal to the SDR interest rate plus a margin. The rate of charge was 1.07% (13-05-05) (IMF 2013g).

becomes necessary. The purpose of these programs is to signal to investors that improvements in the economic environment are to come (Fischer 1997).

The EFF programs are designed for countries experiencing long-termed balance of payments problems. It is also aimed at supporting major structural reforms. This structural agenda is reflected in the conditions attached to the programs. The programs last up to four years with repayments due after four to ten years (IMF 2012).

The FCL programs are designed for countries experiencing all types of balance of payments problems. As with the SBAs, it can either be aimed at solving already existing issues, or to serve as a precautionary measure. However, the program is new in its design since it has a prequalification criterion instead of the conditionality principle. The countries qualifying for these loans must have strong institutions since they are trusted to implement the correct policies to restore balance (John and Knedlik 2011). The programs are issued in one disbursement with repayment between three to five years (IMF 2013d).

The SAF programs are some of the first targeted towards low-income countries. The SAF programs are the only lending arrangement in our sample that is no longer in use<sup>7</sup>. These programs could last up to three years, with repayment between five to ten years (IMF 2001). The loans were borrowed on concessional terms and resembled foreign aid (Barro & Lee 2003, IMF 2004).

The ECF programs are targeted towards low-income countries. These programs are designed for countries experiencing prolonged balance of payments problems. The programs last three to five years and repayments are due within five to ten years (IMF 2013d, IMF 2013h). As with the EFF programs, the conditions attached are focused on structural policy reforms. However, in addition these programs include poverty reduction policies (IMF 2012).

The ESF is a new type of program designed for low-income countries facing urgent balance of payments problems caused by external shocks (IMF 2013d). These programs range between one to two years and repayments are due within five to ten years (IMF 2013k).

---

<sup>7</sup> These programs were active during 1986-1995 (IMF 2004).

### 3. Descriptive Evidence

This section provides descriptive evidence of our data set. The data for the control variables is collected from the databases: Penn World Tables, Barro & Lee and the World Bank. The original resources are presented in Appendix C. Data on the loan disbursements are collected using IMFs own records, displayed on their webpage (see Appendix A). The panel includes 86 countries, during 1983-2010 and is balanced.

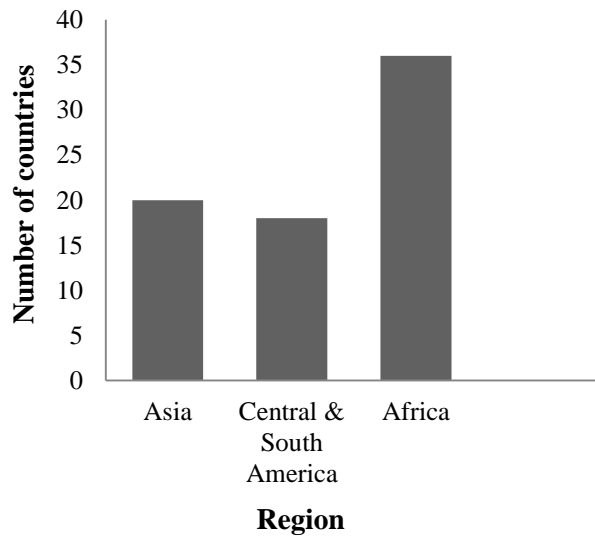
To get an understanding of the data, Appendix A presents a table with all the countries included. It also specifies which region the countries belong to, what kind of programs they have received and during what years the programs were in action. Our analysis is based on this information. Restricting the examination to only include developing countries contributes to a homogeneous dataset. It also facilitates the analysis, as countries with similar income levels tend to grow in a similar manner (Jones 2002, p. 127-132). The countries included in our analysis are ranging from low to upper-middle income economies (i.e. 1.025 dollar or less to a maximum of 12.475 dollars a day) (World Bank 2013a).

Cross-section data often suffers from problems of heteroskedasticity, while time-series data often have problems with non-stationarity and autocorrelation (Verbeek 2008, p. 88-89, 104-105, 270-271). Therefore non-stationarity, heteroskedasticity and autocorrelation are controlled for and detailed information on the tests performed can be found in Appendix B. These problems are corrected for by logging and differentiating the series and using White's standard errors (diagonal) in all the regressions.

The data on loan disbursements show which countries that have received financial support from the IMF. A total number of 166 loan disbursements have been issued during 1983-2010. Most commonly one program is active at the time though there are examples of countries being in multiple arrangements (e.g. Burundi that had both a SBA and SAF program during 1986-1988, see Appendix A). The distribution of loan types in our sample show that SBAs have been granted to 80.23% of the countries, ECFs to 45.35%, EFFs to 29.10%, SAFs to 31.40%, ESFs to 4.65% and FCLs to 2.33% (see Appendix A).

The programs are active during different time periods. In our data the SBAs and EFFs are active the entire time period. The SAF programs are active only during the 1980s and 1990s. Both the ESF and FCL programs are rather new arrangements and have only been active since the 2000s. (See Appendix A).

**Figure 2 – Regional distribution of IMF lending, 1983-2010**



The distribution of the countries included in our sample is not entirely identical when dividing the sample into three regions. Figure 2 illustrates the regional distribution of all the countries that have received at least one loan disbursement. As can be seen the work of the IMF is biased towards Africa in our sample.

## 4. The IMF and economic growth

### 4.1. Theoretical channels of impact

A wide amount of theoretical literature highlights several channels through which the IMF influences economic growth in either a positive or negative way. In spirit of Dreher (2006) four main channels of impact are presented. Both positive and negative aspects are highlighted to get a full image of the IMF's ability to promote growth.

The first channel focuses on the provision of money, including the creation of credit and liquidity. This channel can be viewed as an immediate, short-term solution aimed at stabilising the economic development. Thereby, it creates the necessary conditions for sustained economic growth (Fischer 1997). On the other hand, there is a risk that the effect is diffused. The provision of money can create disincentives to reform the economy, which can result in governments keeping inappropriate policies. Such moral hazards can appear if the performance criteria are not enforced, i.e. the actual costs of entering a program are lower than the expected (Dreher 2006, Stone 2004).

Furthermore, the existence of the IMF, acting as a lender of last resort, can create another type of moral hazard. This can create incentives for countries to adopt infeasible economic policies long before any loan arrangement is required (Evrensel & Kim 2006, Dreher 2006). Thus, if sound policies are not adopted the issue of moral hazards can lead to the creation of a dependency on the IMF (Stone 2004).

Second, the programs also serve as insurance. By setting its "seal of approval" the IMF enhances the credibility of the countries' financial policies and development. The programs ensure, and can even attract more investors (Bauer et. al 2009, Bird & Rowlands 2001). The programs can have an essential function to enable countries to acquire other public and private loans as well (Fischer 1997). On the other hand, participating in an IMF program can be viewed as a sign of economic distress. This indicates that the "seal of approval" set by the IMF does not carry enough market value to affect investors' expectations (Bird 1996, Bauer et. al 2009).

Third, the conditions attached to the programs reassure the commitment to a particular set of macroeconomic policies. However, increasing economic growth is not included under the programs conditionality principles. Growth is instead set as an indicative target and a desired outcome of the actual performance criteria (Fischer 1997, Evrensel 2002). The conditions can include both fiscal austerity and tighter monetary

policies through measures such as: cutting government expenditures, increasing taxes, raising interest rates and devaluing currencies (Abbott et al 2009, Prezworski & Vreeland 2000).

As the focus of the IMF's work changed, it more commonly promoted structural policies. Typical reforms were changing the patterns of government spending, restructuring banking systems as well as liberalizing prices and trade (Bird 1996, Fischer 1997). However, the effectiveness of the programs to affect growth is dependent on the rate of compliance with the policy conditions (Jorra 2011). The rate of compliance differs across countries, indicating that it dependent on the prerequisites of the borrowing countries, such as their institutions and type of regime. For instance, democracies with reliable institutions are found to have a tendency to do better than other types of regimes (Bauer et al. 2009).

Fourth, the IMF can influence growth by providing information through surveillance and financial advice to its member countries. This is done by monitoring the international monetary system and changes in economic policies. Through forecasts, instabilities can be detected and measures to prevent their outbursts can be taken (IMF 2013b).

## **4.2 The growth model**

In spirit of Neo-classical theory, the model applied in this study is based on the classical Solow growth model with technology, where a Cobb-Douglas production function is assumed:  $Y = K^\alpha AL^{1-\alpha}$ . The model is built on three main factors of influence: stock of capital (K), labour (L), and technology (A). The technological progress is assumed to be exogenous in the model. (Jones 2002, p. 36) However, it will be considered in more general terms as the total factor productivity (TFP) in our model.

The TFP is aimed at capturing the efficiency of a country's inputs, including both physical and human capital (Jones 2002, p. 146-147). Thus, the effects of the four theoretical channels are captured by the TFP, represented by A in the production function. The channels are assumed to enhance a productive use of resources and to encourage reforms on policies currently preventing a country from developing.

To capture the effect of these channels, a set of dummy variables is used. To make this study possible the analysis is divided into four models. All the models have the purpose to examine if the IMF promotes growth. Model 1 tests the general effect on growth when given an additional annual loan disbursement. Model 2 tests the specific effects for three decades. This is done by including dummy variables for 1980, 1990 and



2000. Model 3 tests the effects of different kinds of loans, including dummy variables for the six different lending arrangements: SBA, ECF, EFF, SAF, ESF and FCL. Model 4 tests the effects of three regions, including dummy variables for Africa, Asia and South America. The dummy variables take the value one for each year a country receives a loan disbursement, and zero for all other years.

To be able to examine the effects of the dummy variables on growth, control variables are needed. The control variables chosen are based on earlier research (see e.g. Barro & Sala-i-Martin 2004, p. 521-533). The variables represent a country's physical and human capital stock, general health and infrastructure. In all the regression models the following control variables will be used: the stock of capital ( $K_{it}$ ), average total years of schooling ( $edu_{it}$ )<sup>8</sup>, fertility rate ( $fert_{it}$ ), rate of openness ( $open_{it}$ )<sup>9</sup> and life expectancy at birth ( $life_{it}$ ). In accordance with Barro & Sala-i-Martin (2004) the stock of real capital, education, openness and life expectancy are expected to have a positive effect on economic growth, while fertility rate is expected to have a negative effect.

To enable the use of a linear regression model, the production function is transformed. The descriptive alternations of all the variables and sources can be seen in detail in Appendix C. While the descriptive data on all the variables can be found in Appendix D. The general model tested is:

$$\Delta \ln(y_{it}) = \beta_1 \Delta \ln(k_{it}) + \beta_2 \Delta \ln(edu_{it}) + \beta_3 \Delta \ln(fert_{it}) + \beta_4 \Delta (open_{it}) + \beta_5 \Delta \ln(life_{it}) + \beta_6 \Delta \ln(tfp_{it}) + \varepsilon_{it}$$

$$\varepsilon_{it} = \lambda_i + f_t + \eta_{it}$$

where  $y_{it}$  represents GDP per capita growth in country  $i$  at period  $t$ .  $tfp_{it}$  represents the groups of dummy variables tested in each of the four models (the specific regression models can be seen in Appendix F). Since the countries in our sample cannot be considered randomly chosen, fixed effects are used. Therefore, a fixed effects *two way error component model* is applied. The two way error component includes: a time independent country fixed effect ( $\lambda_i$ ) which allows the countries to have an individual intercept; a time dependent fixed effect ( $f_t$ ), which allows time dependent effects that are common to all the countries; the ordinary disturbance term ( $\eta_{it}$ ), which varies with countries and time.

---

<sup>8</sup> Human capital is often explained in growth models as time spent on education; see e.g. the Solow model with human capital and the Lucas model (1988) in Jones 2002, p. 55, 161

<sup>9</sup> Openness is measured as export minus import divided by GDP (University of Pennsylvania 2008).

The regression analysis is conducted using both OLS and 2SLS estimations. The methods differ on the requirements of the explanatory variables. The OLS yields reliable results with exogenous explanatory variables. This means that they are determined outside the model and that they are not correlated with the error term (Hill et al. 2008, p. 276). However, there is a risk that the dummy variables are not exogenous since the IMF programs often are concluded in periods of economic crisis. This means that the dummy variables affect growth, while at the same time growth affects the dummy variables. If this is the case the dummy variables reflect the negative effects of the underlying crisis (Dreher 2006).

The 2SLS, on the other hand, can account for endogenous explanatory variables. By including instrumental variables the effects of the dummy variables on growth is isolated and the estimates yield consistent results. An instrumental variable should be correlated with the endogenous variable but not with the error term. In addition, it should not have a direct effect on the explained variable (Hills et al. 2008, p. 278). In our growth model internal instruments are used, represented by lagged dummy variables. The choice of instruments is motivated by the high probability that the dummy variables are correlated with its own lags. However, it is unlikely that the need for a loan is based on information on future growth. Rather the decision is based on the issues seen today. Hence, the dummy variables do not have a direct effect on the explained variable.

### **4.3 Regression results**

The regression results are divided into four sections representing each model. Since the focus of this thesis is to examine the effects on growth from programs, the results of the dummy variables is at focus. The estimates for the dummy variables alone are shown in Table 3-6 and each table represents one model. However the full results, including both control variables and dummy variables, can be seen in Appendix E.

Three columns are presented in each table, representing the different equations estimated in each model. The first equation examines the direct effect on growth, the second equation the one-year lagged effect and the third equation the two-year lagged effect. This means that the effect of the loan disbursements on growth is seen with one respectively two year's hindsight. The lagged estimates test the sensitivity of the results. If the estimates are consistent among the lags the results are considered to be robust. The left part of each column shows the OLS estimates and the right part the 2SLS estimates. The

main focus of the analysis is the results of the 2SLS estimates since they account for endogeneity.

Even though the focus is on the dummy variables, some concluding remarks must be made on the control variables. The results are in general inconclusive. The stock of capital, education, fertility rate and life expectancy all have positive effects on growth. However the results are not robust, since the lagged estimates change signs and are non-significant. As described in Appendix C, the stock of capital was calculated and education interpolated. The stock of capital, education and life expectancy have high standard errors and show inconclusive results. The positive estimates for fertility rate stands in contrast to earlier research (see e.g. Barro & Sala-i-Martin 2004, p. 525). Only openness has a negative effect on growth. However, when lagging one year the effect is positive and significant.

The estimated coefficient of the intercept is approximately 0.012, representing an averaged intercept for the countries in the panel. Since not all countries in our sample have received loans there is no reference dummy and the intercept is included. This means that the estimates for the dummy variables are interpreted as an additional effect on growth. All regression equations show low R-square values. The low rates of explanation can be due to high variance in the data which is common for developing countries. Bird & Rowlands (2001) points out that a feature among some earlier research on the IMF and growth, is a poor overall explanatory power. This problem is explained to be caused by omitted variables. A growth model can include many explanatory factors, and it is impossible to capture them all.

#### **4.3.1 Model 1**

This model tests the overall effect of the annual loan disbursements on economic growth. The results are presented in Table 3.

All estimates show that the loan disbursements have a positive and significant effect on economic growth at the one percentage level. The largest effect on growth is obtained by the 2SLS estimate of the first equation. The coefficient, 0.019 (0.004), indicates that the effect of an annual loan disbursement raises growth with 1.9 % during the same year. The 2SLS estimates show that the positive effect on growth is slowly decreasing with the number of lags. While the positive effect of the OLS estimates is slowly increasing with the number of lags.

**Table 3 – Results for model 1**

Equations	1		2		3	
	OLS	2SLS	OLS	2SLS	OLS	2SLS
IMF	0.008***	0.019***	0.008***	0.019***	0.008***	0.019***
s.e.	(0.003)	(0.004)	(0.003)	(0.004)	(0.003)	(0.004)
IMF(-1)			0.012***	0.018***	0.012***	0.018***
s.e.			(0.003)	(0.004)	(0.003)	(0.004)
IMF(-2)					0.012***	0.013***
s.e.					(0.003)	(0.005)
Observations	2408	2408	2408	2408	2408	2408
R-squared	0.133	0.129	0.135	0.134	0.127	0.127
Number of countries	86	86	86	86	86	86

Significance levels: \* p<0.10; \*\* p<0.05; \*\*\* p<0.01

Coefficients and standard errors in parentheses are reported

The similarity of both estimations allows for an interpretation of the results in general terms rather than separating each estimator. This also indicates that endogeneity is not affecting the results. The results of the first equation are not sensitive to the lagged effects in the second and third equation. The non-sensitivity confirms the robustness of the results.

Our result stands in contrast to much earlier research, which find a negative effect on growth (see e.g. Prezworski & Vreeland 2000, Dreher 2006, Marchesi & Sirtori 2010, Barro & Lee 2003). Though, this examination is based on a yearly data while much of the earlier findings have a longer-termed focus, using five-year averaged data (see e.g. Barro & Lee 2003, Dreher 2006). Our model is aimed at examining the short-term effect, observed directly and with lagged effect. Earlier findings that confirm a positive effect have in the same vein observed a positive lagged effect on growth (see e.g. Atoyán & Conway 2006, Conway 1994, Killick et al. 1990).

The significantly positive results provide an indication that some of the theoretical channels work. The desired effect of the providence of money, aimed at achieving an immediate stabilizing solution is confirmed in our results. For instance, this goal can be achieved by the creation of liquidity (Dreher 2006). If a country has economic issues its credit valuation can be downgraded. This, along with the instability of the commercial markets, creates a gap that the IMF fills through the providence of money and by its “seal of approval”. Thus, these stabilizing effects of the programs are of considerable importance for many countries (Bird 1996).

Decreasing creditworthiness is a key factor driving the demand for IMF loans and the severity of the problems increases the persistency of the demand (Bird 1996). Instability discourages investments and lowers growth (IMF 2013e). In addition, countries with poor prerequisites, in terms of low rates of investments and slow growth, need support from the IMF (Bird 1996). These countries need money, certification or precautionary loan agreements to attract and send signal to investors, raising their expectations (Bird & Rowlands 2001, Fischer 1997). Our results indicate positive effect of the “seal-of-approval”, set by participation in programs, since it signals to markets and investors that the economic issues are to be overcome.

The positive results cannot neither confirm nor reject the existence of moral hazards. Either it can be an indication that moral hazards are not common in our sampled countries, or it can be a pure reflection of the providence of money easing acute issues. This enables countries to keep unwise policies longer, in order to qualify for more IMF programs further ahead (Meltzer 1999, Evrensel 2002).

In the same sense, no confirmable conclusions can be drawn regarding the rate of compliance with policies attached to the programs. A high compliance rate is assumed to increase the effectiveness of the programs. Though, the positive effects in our results slowly decrease with the number of lags. This might be an indication that the rate of compliance is low and the policies necessary to uphold sustained growth are not implemented. Hence, explaining the decline in the size of the positive effect.

#### **4.3.2 Model 2**

This model examines the impact of the loan disbursements by controlling for each decade in our sample. This model investigates whether or not the IMF’s work has been more or less successful throughout time. The results are presented in Table 4.

In accordance with Model 1, both the OLS and 2SLS estimates shows similar results and nearly all the estimates are positive. Most of the 2SLS estimates are of greater size. These estimates also yield significant results in more cases. Furthermore, the negative result for the 2SLS estimate for the 1990s indicates that endogeneity is affecting the results. Though, none of the estimates yield significant results for the 1990s. Therefore, we can conclude that the IMF’s work was successful in raising economic growth during the 1980s and 2000s.

**Table 4 – Results for model 2**

Equations	1		2		3	
	OLS	2SLS	OLS	2SLS	OLS	2SLS
IMF80	0.005	0.021**	0.005	0.021**	0.005	0.021**
s.e.	(0.005)	(0.009)	(0.005)	(0.009)	(0.005)	(0.009)
IMF80(-1)			0.015***	0.036***	0.015***	0.036***
s.e.			(0.005)	(0.010)	(0.005)	(0.010)
IMF80(-2)					0.022***	0.019*
s.e.					(0.006)	(0.010)
IMF90	0.006	0.016	0.006	0.016	0.006	0.016
s.e.	(0.006)	(0.010)	(0.006)	(0.010)	(0.006)	(0.010)
IMF90(-1)			0.008	0.000	0.008	0.000
s.e.			(0.006)	(0.009)	(0.006)	(0.009)
IMF90(-2)					0.002	-0.005
s.e.					(0.005)	(0.009)
IMF00	0.011***	0.020***	0.011***	0.020***	0.011***	0.020***
s.e.	(0.004)	(0.006)	(0.004)	(0.006)	(0.004)	(0.006)
IMF00(-1)			0.013***	0.022***	0.013***	0.022***
s.e.			(0.004)	(0.006)	(0.004)	(0.006)
IMF00(-2)					0.015***	0.027***
s.e.					(0.004)	(0.006)
Observations	2408	2408	2408	2408	2408	2408
R-squared	0.133	0.129	0.135	0.128	0.130	0.128
Number of countries	86	86	86	86	86	86

Significance levels: \* p<0.10; \*\* p<0.05; \*\*\* p<0.01

Coefficients and standard errors in parentheses are reported

The estimated coefficients for the 1980s and 2000s are all positive. The 2SLS estimates are not sensitive to lagging the effect one and two years. This confirms the robustness of these results. The 1980s includes fewer years, since our sampled period starts in 1983. This restricts the number of observations during this decade. The OLS estimate is non-significant for the 1980s, which suggest the superiority of the 2SLS estimator. The largest estimated coefficient for 1980s is obtained by using a one-year lag, 0.036 (0.009). The coefficient is significant at the one percentage level. The effect on growth is decreasing in both directions, indicating that the positive effect on growth after one year is larger than both the direct and two-year lagged effect. The largest estimated coefficient for 2000s is obtained by using two lags, 0.027 (0.006). The coefficient is significant at the one percentage level. The effect is slowly increasing with the number of lags, indicating an accumulating effect from the IMF's work.

The 1980s is characterized by a structurally oriented development of IMF programs, aimed at fostering growth. This development is targeted towards low-income countries (Easterly 2005). Typically occurring programs during this decade are SBAs and ECFs. A pattern can be seen for these programs, as they are often given after each other (see Appendix A). This setup can confirm the structurally based focus of the IMF's work, which corresponds to established growth strategy<sup>10</sup>. The SBA programs are aimed at solving short-term issues, while the ECFs are aimed at longer-termed structural reforms. Our results show a large positive effect on growth with a one-year lag. This result can serve as an indication that the shorter-termed problems are corrected. The positive effect is smaller with a two-year lag. Hence the positive effect on growth decreases slowly suggesting that further assistance is needed, which the combination with ECF programs provides.

Examining the 1990s none of the estimates are significant. The first equation shows that the direct effect is positive. The effect is then decreasing with the number of lags and is negative with a two-year lag. Hence, these results leave no confirmable conclusions for this decade.

In contrast, a positive effect on growth is shown during the 2000s. Based on the emergence of the financial crisis in 2008, the explanation of the overall positive results is twofold. On the one hand, there is usually a boom before the bust. Heading towards the crisis growth rates flourished contributing to a general positive development. On the other hand, it can be explained by the development of a consensus on the economic institutions necessary for stable growth. Some examples are setting inflation targets, higher rate of surveillance of the financial markets and restricting budget deficits (Borio & White 2004). These kinds of targets facilitate the IMF's work, as it creates a general confidence in the policies attached to the programs. The positive effect shown in our results is increasing with the number of lags. This accumulating effect of the IMF's work also indicates a high efficiency of the attached policies during this decade in promoting growth.

### **4.3.3 Model 3**

This model examines the effect from the different kinds of programs on growth. The results are presented in Table 5. This model is restricted to using one-year lags. Since

---

<sup>10</sup> In Rodrik (2003) a growth strategy is presented. It emphasizes the enforcement of policies that kick-start the economy (in the way the SBA's do by solving short-term problems), while at the same implementing long-term policies that can sustain the increased economic growth (in the same way as the ECF's structural reforms).

many countries have received more than one type of program the number of dummy variables is large. Therefore, it is not possible to run the regressions with two-year lags as it causes a dummy trap.

**Table 5 – Results for model 3**

Equations	1		2	
	OLS	2SLS	OLS	2SLS
SBA	-0.000	0.013**	-0.000	0.013**
s.e.	(0.003)	(0.005)	(0.003)	(0.005)
SBA(-1)			0.009**	0.019***
s.e.			(0.003)	(0.006)
EFF	0.002	0.010	0.002	0.010
s.e.	(0.005)	(0.006)	(0.005)	(0.006)
EFF(-1)			0.004	0.001
s.e.			(0.004)	(0.012)
ECF	0.016***	0.016**	0.016***	0.016**
s.e.	(0.005)	(0.006)	(0.005)	(0.006)
ECF(-1)			0.011**	0.013**
s.e.			(0.004)	(0.006)
SAF	0.003	0.009	0.003	0.009
s.e.	(0.012)	(0.020)	(0.012)	(0.020)
SAF(-1)			0.004	-0.005
s.e.			(0.014)	(0.021)
ESF	-0.010	-0.013	-0.010	-0.013
s.e.	(0.020)	(0.036)	(0.020)	(0.036)
ESF(-1)			-0.008	0.003
s.e.			(0.024)	(0.061)
FCL	-0.012	0.019*	-0.012	0.019*
s.e.	(0.020)	(0.011)	(0.020)	(0.011)
FCL(-1)			0.004	-0.745 <sup>11</sup>
s.e.			(0.015)	(2.205)
Observations	2408	2408	2408	2408
R-squared	0.135	0.130	0.134	0.039
Number of countries	86	86	86	86

Significance levels: \* p<0.10; \*\* p<0.05; \*\*\* p<0.01

Coefficients and standard errors in parentheses are reported

In general the results show that three loan types have a positive effect on growth: SBAs,

<sup>11</sup> The FCL program has only been issued to Mexico and Columbia, during 2009-2010. When lagging the dummy variables, half of the already few observations is lost. This can explain the large standard errors and the low R-squared value. If the FCL dummy is excluded, the R-squared value is similar to the result in Model 1 (0.129).



EFFs and ECFs. Though, the effects are only significant for two of them: SBAs and ECFs. The largest estimated coefficient for the SBAs is obtained with a one-year lag, 0.019 (0.006). The coefficient is significant at the one percentage level. The effect is slowly increasing with the number of lags. This indicates an accumulating effect from the IMF's work.

The positive effect can be explained by the characteristics of the countries receiving these loans. The SBAs have a short-term focus and are designed for countries with less severe issues, which can be solved by temporary economic relief and stabilizing support. Hence, the aims of these programs can be interpreted as smoothing the economic development. In addition, some earlier research has found that SBA programs do provide a balance of payments relief during the program years (see e.g. Evrensel 2002). These programs also offer the possibility to withdraw disbursement as a precautionary measure if it becomes needed. There are many countries in our sample which have received this loan, confirming the reliability of the results.

The largest estimated coefficient for the ECFs is obtained without lags, 0.016 (0.006). The coefficient is significant at the five percentage level. The significantly positive estimates of the SBAs and the ECFs are not sensitive to lagging the effect one year. Thus, confirming the robustness of these estimates.

The ECF programs show consistently positive effects on growth, indicating positive effects of the structural approach. Most of the low-income countries have received this type of program (see Appendix A). Arguably many of these countries have not suffered from severe crises. Rather the loans issued to these countries have wider aims, i.e. helping the countries restructure their economies. Our results conclude that these programs have short-term effects on growth as well. This stands in contrast to earlier findings, where the IMF is criticized for not developing programs that suit low-income countries (see e.g. Marchesi & Sirtori 2010).

In contrast to the SBAs, the effect of the ECFs is slowly decreasing with the number of lags. This indicates a decreasing effect from the IMF's work. In summary we conclude that both SBA and ECF programs promote growth during and at least one year after an agreement.

For the remaining programs the results are not straight forward. For the SAFs, ESFs and FCLs the two estimators show different signs. This indicates that the OLS estimates are affected by endogeneity, confirming the superiority of the 2SLS estimates. No robust results on the effects of these loans can be confirmed, since the estimates change signs

when using one-year lags. Furthermore, the EFFs, SAFs and ESFs show non-significant results.

The results for the FCL programs are ambiguous. The direct effect shows a significantly positive result, 0.019 (0.011). However, the effect on growth with a one-year lag is negative but non-significant. The results of these loans are based on a small sample. Only two countries, Mexico and Colombia, have received the program. This limited selection indicates that the results should be interpreted with caution, as it reflects the development in these two countries. Therefore, we cannot draw any confirmable conclusions on the effects of this program.

The EFFs program shows a positive but non-significant effect on growth. A common critique against the IMF is that the rate of compliance with the conditionality principle is low (see e.g. Dreher 2006). The EFF programs have broken down more frequently than the SBA's, indicating the inefficiency of the EFF programs (Bird 1996). Furthermore, during the period 1986-1994 the SAF programs were frequently interrupted, one or several occasions, during the agreed lending period. Most of the interruptions were caused by slippage on the conditions, and some were due to disagreements (Dreher 2006). This can not only explain the non-significant result for SAF programs, but also the negative and insignificant estimate obtained with the one-year lag.

The ESF programs show a negative direct effect on growth, and a positive lagged effect. Though, none of the estimates are significant. The ESF programs are aimed at solving short-term issues in low-income countries experiencing external shocks. Hence, the borrowing countries have relatively poor pre-requisites when entering the programs. In our sample three countries in Africa: Malawi, Mozambique and Senegal, and one in Asia, Maldives, have received this program (see Appendix A). Based on this, the probability of promoting growth, after only one year in the program, is presumably small. No confirmable conclusions on the effect of this program on growth can be drawn.

#### **4.3.4 Model 4**

This model investigates whether or not the IMF's work has been more or less successful in Africa, Asia and South America. The results are presented in Table 6.

Our results indicate differences in the size of the effect on growth among the regions. This is in contrast to earlier findings (see e.g. Conway 1994). Both Asia and South

America have positive and significant estimates, where the effect on growth for South America is larger than the effects for Asia.

**Table 6 – Results for Model 4**

Equations	1		2		3	
	OLS	2SLS	OLS	2SLS	OLS	2SLS
Africa	0.016***	0.014	0.016***	0.014	0.016***	0.014
s.e.	(0.005)	(0.009)	(0.005)	(0.009)	(0.005)	(0.009)
Africa(-1)			0.007	0.006	0.007	0.006
s.e.			(0.005)	(0.009)	(0.005)	(0.009)
Africa(-2)					0.004	0.000
s.e.					(0.005)	(0.009)
Asia	-0.005	0.005	-0.005	0.005	-0.005	0.005
s.e.	(0.006)	(0.008)	(0.006)	(0.008)	(0.006)	(0.008)
Asia(-1)			0.005	0.017**	0.005	0.017**
s.e.			(0.006)	(0.007)	(0.006)	(0.007)
Asia(-2)					0.013**	0.019***
s.e.					(0.005)	(0.007)
South America	0.005	0.023***	0.005	0.023***	0.005	0.023***
s.e.	(0.004)	(0.006)	(0.004)	(0.006)	(0.004)	(0.006)
South America(-1)			0.016***	0.023***	0.016***	0.023***
s.e.			(0.004)	(0.006)	(0.004)	(0.006)
South America(-2)					0.016***	0.018***
s.e.					(0.004)	(0.006)
Observations	2408	2408	2408	2408	2408	2408
R-squared	0.134	0.130	0.134	0.132	0.126	0.126
Number of countries	86	86	86	86	86	86

Significance levels: \* p<0.10; \*\* p<0.05; \*\*\* p<0.01

Coefficients and standard errors in parentheses are reported

For Africa the effect is positive but decreasing with the number of lags and approaches zero with the two-year lag. Though, none of the results are significant. The positive effect stands in contrast to earlier findings on the region, which conclude a negative association between the IMF and growth (see e.g. Stone 2004). Arguably, there are two main explanations for the non-significant results. Firstly, that the programs have not been successful enough to promote significant effect on growth in this region. Secondly, the IMF's work is complicated by the relatively low pre-requisites among the large ratio of low-income countries in Africa. Many of the countries lack fundamental institutions and the economic instruments needed to implement the reforms attached to the programs

(Stone 2004). In summary, we cannot draw any confirmable conclusions on the effect since the results are not significant.

The overall effect in Asia is positive. The OLS estimate in the first equation show a negative effect. This can be explained by the emergence of the Asian crisis in 1997. Hence, due to endogeneity the OLS estimate picks up the effect of the underlying crisis. Once endogeneity is managed the 2SLS show significantly positive effects of the lagged estimates. The effect is increasing with the number of lags, from 1.7% with a one-year lag to 1.9% with a two-year lag.

During the Asian crisis the programs emphasized trade liberalization and stable exchange rates (Fischer 1998). Our results indicate that these reforms have positive effects. An example of a country suffering the consequences of the Asian crisis is Indonesia and at the time the country had two different programs during this time. Indonesia had negative economic growth rate in 1997-1998, while a positive during the 2000s<sup>12</sup>. The Indonesian case also seems to stand in line with the effects found in Model 2. The estimates for the 1990s decrease with the number of lags and are negative with a two-year lag, while the estimates for the 2000s are all significantly positive. In summary, the positive development for countries such as Indonesia can reflect the overall positive results of the IMF's work in the region.

Both the OLS and 2SLS estimates show positive results for South America. All three 2SLS estimates for South America are significant at the one percentage level. These estimates are not sensitive to lagging the effect either one or two years. Therefore, the 2SLS yields robust results for the effect of South America. The highest effect on growth is 2.3%, obtained both in the program year and the year after. The effect of the two-year lagged estimate is lower, indicating a decreasing effect from the IMF's work. Earlier findings confirm short-term positive effects on the current account, balance of payments and investments (see e.g. Ozturk 2008). Investors are attracted to countries where a longer-term payoff is possible (Bauer et al 2009). Our positive result indicates that the IMF can restore investors' confidence.

In summary, both the Asian and South American regions have better prerequisite compared to the African region. This facilitates the implementation of policy reforms, since they have stronger fundamentals. In our sample three countries: Brazil, India and

---

<sup>12</sup> According to our calculations found on data from Penn World Tables, the annual GDP per capita growth in Indonesia was in 1998: -0.156 and in 2002: 0,0212.

China, all part of the Brics<sup>13</sup>, are often referred to as ‘growth miracles’ with a strong positive development. By including these countries in our sample the mean growth rates in the regions is raised. The overall positive results for the region can be explained by these successful countries. The consistency in results concludes that the IMF is successful in both Asia and South America.

---

<sup>13</sup> The Brics consists of Brazil, Russia, India, China and South Africa. It is an association of fast-growing economies (Desai 2013).

## 5. Conclusion

The success of the IMF's lending arrangements has been subject to much debate. The IMF began its work with a main focus on helping governments to restore balance of payments problems but throughout time its purpose expanded beyond crisis management. Today, the IMF works in both industrialized and developing countries, with the overall aim to increase economic growth and living standards. In this thesis the short-term effects on growth of the IMF's lending arrangements in developing countries is analysed.

In theory, the IMF can influence economic growth via several channels. This thesis identifies four: provide money through loan disbursements, work as an insurance for investors, attach policy conditions to programs and monitor the world economy. Much research has examined the effect of the IMF's work on growth, but the results are ambiguous. By performing a wide examination and analysing the different aspects of the lending arrangements, it is possible to conclude that the IMF has been successful in promoting growth. The effect on growth from an additional annual loan disbursement is significantly positive. Though there are qualitative, historical and regional deviations.

One of the main contributions of this thesis is the analysis of the different kinds of loans. Two lending arrangements, Stand-by arrangements (SBA) and Extended credit facility (ECF) have significantly positive effects on growth. These programs also represent the major directions of the IMF: providing monetary relief and structural development. The results indicate that the IMF has been successful in achieving the aims of these policies in the short-run.

Furthermore, the analysis shows a significantly positive result on growth when controlling for the 1980s and 2000s. By dividing the data in shorter time periods we capture the evolvement of the IMF's work and can conclude a positive tendency. During the late 1980s the focus of the IMF's work changed towards promoting growth in developing countries. New lending arrangements were established and the reach of the policy conditions were widened. This process of adjustment is reflected in the positive results on growth during the 2000s.

The IMF is successful in raising economic growth in Asia and South America. Though, despite these positive results it is never possible to entirely protect countries from the negative effects of external factors. The outburst of an economic crisis or a natural disaster in one part of the world can influence the world economy. This can obstruct the work of the IMF, even if programs are well-designed. These external factors highlight the

importance of surveillance of the member countries and the world economy. Furthermore, the individual preconditions of the member countries cannot be completely accounted for. This can be an explanation for the non-significant results for the African region, leading to the conclusion that individual factors need to be taken into account. In general, immersing to regional and local conditions can be of importance to get a deeper understanding of how the IMF can promote growth.

Potential issues with endogenous variables are often highlighted in research on the IMF's work. In this thesis internal instruments are used, by adding the lagged dummy variables for loan disbursements. This provides suitable instruments, but not perfect ones. It is difficult to find efficient instruments and this has to be taken into account in the analysis. In addition, a constraining factor is the availability and quality of data for developing countries. A higher variance is expected in this data. Since some of the lending arrangements are fairly new, few observations are available. This constraint on the data hampers the possibility to draw confirmable conclusions and can explain some of the non-significant results.

Economic growth is a wide subject and many explanatory factors can be included in models. Though all models are simplifications of the real conditions observed. This means that there is always a risk that important explanatory factors are left out, lowering the power of explanation. Even though this thesis contributes to a wider knowledge on the subject, unexplained factors remain. In spirit of Bird & Rowlands (2001), the nature of the subject suggests that development of even wider models is useful to further investigate the connection between the IMF and economic growth.

## References

- Abbott, Philip & Barnebeck Andersen, Thomas & Tarp, Finn (2009). "IMF and economic reform in developing countries", *The Quarterly Review of Economics and Finance*, vol. 50 (1), pp. 17-26. [Electronic] <http://www.sciencedirect.com/science/article/pii/S1062976909000970>. (2013-04-25)
- Atoyan, Ruben & Conway, Patrick, (2006). "Evaluating the impact of IMF programs: A comparison of matching and instrumental-variable estimators", *The Review of International Organizations*, vol. 1 (2), pp. 99-124, [Electronic], <http://hdl.handle.net/10.1007/s11558-006-6612-2>. (2013-04-24)
- Barro, Robert, J. & Lee, Jong-Wha, (2003). "IMF Programs: Who Is Chosen and What Are the Effects?", *Journal of Monetary Economics*, vol. 52 (7), pp. 1245–1269. [Electronic] <http://dx.doi.org/10.1016/j.jmoneco.2005.04.003>. (2013-04-12)
- Barro, Robert J. & Lee, Jong-Wha, (2013), "Education Attainment for Population Aged 15 and Over", [Electronic] <http://www.barrolee.com>. (2013-04-12)
- Barro, Robert, J. & Sala-i-Martin, Xavier, (2004). *Economic Growth*. 2<sup>nd</sup> edition, Cambridge: The MIT Press
- Bauer, Molly & Cruz, Cesi & Graham, Benjamin, A. T., (2009) "Democracies Only: When do IMF Agreements Serve as a Seal of Approval?", *Review of International Organizations*, vol. 7 (1), pp. 33-58, [Electronic] <http://hdl.handle.net/10.1007/s11558-011-9122-9>. (2013-05-05)
- Bird, Graham, (1996). "The International Monetary Fund and Developing Countries: A Review of the Evidence and Policy Options", *International Organization*, vol. 50 (3), pp. 477-511, [Electronic] <http://www.jstor.org/stable/2704033>. (2013-04-09)
- Bird, Graham & Rowlands, Dane, (2001). "IMF lending: how is it affected by economic, political and institutional factors?", *The Journal of Policy Reform*, vol. 4 (3), pp. 243-270, [Electronic] <http://dx.doi.org/10.1080/13841280108523421>. (2013-05-05)
- Bloom, David, E., & Finlay, Jocely, E., (2008). "Demographic Change and Economic Growth in Asia", PGDA Working Paper No. 41, The Program on the Global Demography of Aging, September 2008 [Electronic] [http://www.hsph.harvard.edu/pgda/WorkingPapers/2008/PGDA\\_WP\\_41.pdf](http://www.hsph.harvard.edu/pgda/WorkingPapers/2008/PGDA_WP_41.pdf). (2013-05-20)
- Boria, Claudio & White, William, (2004). "Whither monetary and financial stability? The implications of evolving policy regimes", BIS Working Papers No. 147, Bank of International Settlements, February 2004 [Electronic] <http://www.bis.org/publ/work147.pdf>. (2013-05-24)
- Brooks, Chris, (2008). *Introductory Econometrics for finance*. 2<sup>nd</sup> edition, Cambridge: Cambridge University Press



de Brouwer, Gordon, (2004). "The IMF and East Asia: A Changing Regional Financial Architecture", pp. 254-287 in Vines, David, Gilbert, Christopher, L., (ed.), *The IMF and its Critics: Reform of Global Financial Architecture*. Cambridge: Cambridge University Press. [Available] [https://crawford.anu.edu.au/pdf/staff/gordon\\_debrouwer/GdB03-05.pdf](https://crawford.anu.edu.au/pdf/staff/gordon_debrouwer/GdB03-05.pdf). (2013-05-19)

Conway, Patrick, (1994). "IMF lending programs: Participation and impact", *Journal of Development Economics*, vol. 45 (2), pp. 365-391, [Electronic] [http://dx.doi.org/10.1016/0304-3878\(94\)90038-8](http://dx.doi.org/10.1016/0304-3878(94)90038-8). (2013-04-25)

Dicks-Mireaux, Louis & Mecagni, Mauro & Schadler, Susan, (2000). "Evaluating the effect of IMF lending to low-income countries", *Journal of Development Economics*, vol. 61 (2), pp. 495-526, [Electronic] [http://www.development.wne.uw.edu.pl/uploads/Courses/dw\\_11\\_1.pdf](http://www.development.wne.uw.edu.pl/uploads/Courses/dw_11_1.pdf). (2013-05-25)

Dougherty, Christopher, (2011). *Introduction to econometrics*. 4<sup>th</sup> edition, Oxford: Oxford University Press

Dreher, Axel, (2006). "IMF and Economic Growth: The Effects of Programs, Loans, and Compliance with Conditionality", *World Development*, vol. 34 (5), pp. 769–788 [Electronic]. <http://dx.doi.org/10.1016/j.worlddev.2005.11.002>. (2013-04-09)

Easterly, William, (2005). "What did structural adjustment adjust? The association of policies and growth with repeated IMF and World Bank adjustment loans", *Journal of Development Economics*, vol. 76 (1) pp. 1-22, [Electronic] <http://dx.doi.org/10.1016/j.jdeveco.2003.11.005>. (2013-05-12)

Evrensel, Ayse, Y., (2002). "Effectiveness of IMF-supported stabilization programs in developing countries", *Journal of International Money and Finance*, vol. 21(5), pp. 565-587, [http://dx.doi.org/10.1016/S0261-5606\(02\)00010-4](http://dx.doi.org/10.1016/S0261-5606(02)00010-4). (2013-04-09)

Evrensel, Ayse, Y. & Kim, Jong, Sung, (2006). "Macroeconomic policies and participation in IMF programs", *Economic Systems*, vol. 30 (3), pp. 264–281, [Electronic]. <http://dx.doi.org/10.1016/j.ecosys.2006.05.002>. (2013-04-09)

Fischer, Stanley, (1997). "Applied Economics in Action: IMF Programs", *The American Economic Review*, vol. 87 (2), pp.23-27, [Electronic]. <http://www.jstor.org/stable/2950877>. (2013-04-24)

Fischer, Stanley, (1998). "The IMF and the Asian Crisis", (Address by Stanley Fischer), The International Monetary Fund, IMF external relations department, Los Angeles (1998-03-20), [Electronic] <http://www.imf.org/external/np/speeches/1998/032098.HTM>. (2013-04-24)

Hall, Robert, E., & Jones, Charles I., (1999). "Why Do Some Countries Produce So Much More Output Per Worker Than Others?," *The Quarterly Journal of Economics*, vol. 114 (1), pp. 83-116, [Electronic]<http://www.nber.org/papers/w6564.pdf>. (2013-05-10)

Harris, Richard & Sollis, Robert, (2003). *Applied times series modelling and forecasting*. 1<sup>st</sup> edition, New York: John Wiley & Sons

Heston, Alan & Summers, Robert & Aten, Bettina, (2012) “Penn World Table Version 7.1”, Center for International Comparisons of Production, Income and Prices at the University of Pennsylvania, [Electronic]. [https://pwt.sas.upenn.edu/php\\_site/pwt71/pwt71\\_form\\_test.php](https://pwt.sas.upenn.edu/php_site/pwt71/pwt71_form_test.php). (2013-04-11)

Hill, R. Carter & Griffiths, William E. & Lim, Guay C., (2008). *Principles of Econometrics*. 3<sup>rd</sup> edition. Hoboken, N.J.: John Wiley & Sons

International Monetary Fund, (2013a). “IMF lending arrangements”. [Electronic]. <http://www.imf.org/external/np/fin/tad/extarr1.aspx>. (2013-04-09)

International Monetary Fund, (2013b). ”Factsheet: The IMF at a glance”. [Electronic] <http://www.imf.org/external/np/exr/facts/glance.htm>. (2013-04-09)

International Monetary Fund, (2013d). “Factsheet: IMF lending”. [Electronic] <http://www.imf.org/external/np/exr/facts/howlend.htm>. (2013-04-10)

International Monetary Fund, (2013f). “What we do”. [Electronic] <http://www.imf.org/external/about/whatwedo.htm>. (2013-04-09)

International Monetary Fund, (2013g). “SDR Interest Rate, Rate of Remuneration, Rate of Charge and Burden Sharing Adjustment”. [Electronic] <http://www.imf.org/external/np/tre/sdr/burden/2013/042913.htm>. (2013-05-06)

International Monetary Fund, (2013h). “Factsheet: IMF Extended Credit Facility”. [Electronic] <http://www.imf.org/external/np/exr/facts/ecf.htm>. (2013-05-10)

International Monetary Fund, (2013i). “IMF Lending Arrangements”. [Electronic] <http://www.imf.org/external/np/fin/tad/extarr1.aspx>. (2013-05-10)

International Monetary Fund, (2004). “IMF Concessional Financing through the ESAF”. [Electronic] <http://www.imf.org/external/np/exr/facts/esaf.htm>. 2013-04-10

International Monetary Fund, (2013j). “Membership”. [Electronic] <http://www.imf.org/external/about/members.htm>. (2013-05-10)

International Monetary Fund, (2013k). “Factsheet: The Exogenous Shocks Facility - High Access Component” (ESF - HAC)”. [Electronic] <http://www.imf.org/external/np/exr/facts/esf.htm>. (2013-05-10)

International Monetary Fund, (2013l). “Debt and painful reforms (1982–89)” [Electronic] <http://www.imf.org/external/about/histdebt.htm>. (2013-05-21)

International Monetary Fund, (2013m). “Societal Change for Eastern Europe and Asian Upheaval (1990-2004)” [Electronic] <http://www.imf.org/external/about/histcomm.htm>. (2013-05-21)

International Monetary Fund, (2001). “Structural Conditionality in Fund-Supported Programs” [Electronic] <http://www.imf.org/external/np/pdr/cond/2001/eng/struct/cond.pdf>. (2013-05-20)

International Monetary Fund, (2008) “Factsheet: How the IMF Helps to Resolve Balance of Payments Difficulties” , [Electronic] <http://www.imf.org/external/np/exr/facts/crises.htm>. (2013-05-20)

Inaternational Monetary Fund (2012), “IMF Annual Report 2012”, [Electronic] [http://www.imf.org/external/pubs/ft/ar/2012/eng/pdf/ar12\\_eng.pdf](http://www.imf.org/external/pubs/ft/ar/2012/eng/pdf/ar12_eng.pdf). (2013-05-20)

John, Jari & Knedlik, Tobias, (2011). “New IMF Lending Facilities and Financial Stability in Emerging Markets”, *Economic Analysis & Policy*, vol. 41 (2), pp. 225-238, [Electronic] [http://www.eap-journal.com/archive/v41\\_i2\\_07-knedilk.pdf](http://www.eap-journal.com/archive/v41_i2_07-knedilk.pdf). (2013-05-19)

Jones, Charles I., (2002). *Introduction to Economic Growth*. 2<sup>nd</sup> edition. New York: W.W Norton & Company.

Jorra, Markus, (2011). “The Effect of IMF Lending on the Probability of Sovereign Debt Crises”, *Journal of International Money and Finance*, vol. 31 (4), pp. 709-725, [Electronic] [http://www.uni-marburg.de/fb02/makro/forschung/magkspapers/26-2010\\_jorra.pdf](http://www.uni-marburg.de/fb02/makro/forschung/magkspapers/26-2010_jorra.pdf). (2013-05-05)

Killick, Tony & Malik, Moazzam & Manuel, Marcus, (1992). “What Can We Know about the Effects of IMF Programmes?”, *The World Economy*, vol. 15 (5), pp 575–598, [Electronic] <http://onlinelibrary.wiley.com.ludwig.lub.lu.se/doi/10.1111/j.1467-9701.1992.tb00538.x/pdf>. (2013-05-06)

Marchesi, Silvia & Sirtori, Emanuela, (2011). “Is two better than one? The effects of IMF and World Bank interaction on growth”, *The Review of International Organizations*, vol. 6 (3), pp. 287-306, [Electronic] <http://dipeco.economia.unimib.it/corsi/739/lezioni/marchesisirtoririo.pdf>. (2013-04-09)

Meltzer, Allan (1999). “What’s wrong with the IMF? What would be better?”. *The independent review*, vol. 4 (2), pp. 201-215, [Electronic] [http://www.independent.org/pdf/tir/tir\\_04\\_2\\_meltzer.pdf](http://www.independent.org/pdf/tir/tir_04_2_meltzer.pdf). (2013-04-25)

Nunnenkamp, Peter, (1998). “Dealing with the Asian crisis: IMF conditionality and implications in Asia and beyond“, *Intereconomics*, vol. 33 (2), pp. 64-72, [Electronic] <http://hdl.handle.net/10419/1742>. (2013-05-19)

Ozturk, Ilhan, (2008). “Evaluating the Macroeconomic Impacts of IMF Programmes in Latin America, 1975-2004: A GEE Analysis”, *South African Journal of Economic and Management Sciences*, vol. 11 (2), pp.190-202, [Electronic] <http://www.sajems.org/index.php/sajems/article/view/308/119>. (2013-05-05)

Presbitero, Andera F. & Zazzaro, Alberto, (2012). “IMF Lending in Times of Crisis: Political Influences and Crisis Prevention”, *World Development*, vol. 40 (10), pp. 1944-1969, [Electronic] <http://dx.doi.org/10.1016/j.worlddev.2012.04.009>. (2013-04-09)

Przeworski, Adam & Vreeland, James Raymond, (2000). "The effect of IMF programs on economic growth", *Journal of Development Economics*, vol. 62 (2), pp. 385–421 [Electronic]. [http://dx.doi.org/10.1016/S0304-3878\(00\)00090-0](http://dx.doi.org/10.1016/S0304-3878(00)00090-0). (2013-04-22)

Reichmann, T.M. & Stillson, R.T., (1978). "Experience with programs of balance of payments adjustment: stand-by arrangements in the highest tranches, 1963–72". *IMF Staff Papers* 25, pp. 292–310. [Electronic]. <http://www.palgrave-journals.com/imfsp/journal/v25/n2/pdf/imfsp197811a.pdf>. (2013-05-05)

Rodrik, Dani, (2003). "Growth strategies", NBER Working Paper No. 10050, National Bureau of Economic Research, October 2003 [Electronic]. <http://www.nber.org/papers/w10050>. (2013-04-24)

Stone, Randall, W., (2004). "The Political Economy of IMF Lending in Africa", *American Political Science Review*, vol. 98 (4), pp. 577-591, [Electronic] <http://www.jstor.org/stable/4145326>. (2013-05-05)

Stephey, M.J. (2008). "A brief history of the Bretton Woods System", *Time Business & Money*, Oct. 21, 2008 [Electronic] <http://www.time.com/time/business/article/0,8599,1852254,00.html>. (2013-05-20)

University of Pennsylvania, (2008). "Penn World Table: Study documentation" [Electronic] <http://idsc.iza.org/metadata/PDF/365.pdf>. (2013-04-20)

The World Bank, (2013a). "Country and Lending groups" [Electronic]. <http://data.worldbank.org/about/country-classifications/country-and-lending-groups>. (2013-04-24)

The World Bank, (2013b), "Fertility rate, total (births per woman)". [Electronic]. <http://data.worldbank.org/indicator/SP.DYN.TFRT.IN>. (2013-04-24)

The World Bank, (2013c), "Life expectancy at birth, total (years)". [Electronic]. <http://data.worldbank.org/indicator/SP.DYN.LE00.IN>. (2013-04-24)

Verbeek, Marno, (2008), *A Guide to Modern Econometrics*. 3<sup>rd</sup> edition. Chichester: John Wiley & Sons Lt

## Appendix A – Summary of countries, regions and programs

	Country <sup>14</sup>	Region <sup>15</sup>	SBA	EFF	ECF	SAF	ESF	FCL
1	Afghanistan	Asia			(2006-2010)			
2	Albania		(1992- 1993)	(2006-2009)	(1993-1996, 1998-2009)			
3	Algeria	Africa	(1989-1992, 1994-1995)	(1995-1998)				
4	Argentina	South America	(1984-1992, 1996-1998, 2000-2006)	(1992-1996, 1998-2000)				
5	Bangladesh	Asia	(1985-1987)		(1990-1993, 2003-2007)	(1987-1990)		
6	Belize	Central America	(1984-1986)					
7	Benin	Africa			(1993-2010)	(1989-1992)		
8	Bolivia	South America	(1986-1987, 2003-2006)		(1988-2002)	(1986-1988)		
9	Botswana	Africa						
10	Brazil	South America	(1988-1990, 1992-1993, 1998-2005)	(1983-1986)				
11	Bulgaria		(1991-1998, 2002-2007)	(1998-2001)				
12	Burundi	Africa	(1986-1988)		(1991-1994, 2004-2010)	(1986-1989)		
13	Cambodja	Asia			(1994-1997, 1999-2003)			
14	Cameroon	Africa	(1988-1992, 1994-1996)		(1997-2009)			
15	Central African Republic	Africa	(1984-1988, 1994-1995)		(1998-2002, 2006-2010)	(1987-1990)		
16	Chile	South America	(1983-1985, 1989-1990)	(1985-1989)				

<sup>14</sup> Source: IMF (2013i). To avoid writing 86 references for the data on disbursements for individual countries we refer to IMF (2013i) and encourage you to select the country of interest.

<sup>15</sup> Some countries do not belong to any region, which means that the dummy for these countries is always zero. This is due to our choice of regions; Asia, Africa and South America, which do not include all the countries given loans during our chosen time period.

17	China	Asia	(1986-1987)				
18	Colombia	South America	(2003-2006)	(1999-2002)			(2009-2010)
19	Democratic Republic of the Congo	Africa	(1983-1990)		(2002-2006, 2009-2010)	(1987-1990)	
20	Congo	Africa	(1986-1988, 1990-1992, 1994-1995)		(1996-1999, 2004-2010)		
21	Costa Rica	Central America	(1985-1997, 2009-2010)				
22	Cote d'Ivoire	Africa	(1984-1992)		(1994-2005, 2009-2010)		
23	Cuba						
24	Dominican Republic		(1985-1986, 1991-1994, 2003-2010)	(1983-1985)			
25	Ecuador	South America	(1983-1992, 1994-1995, 2000-2001, 2003-2004)				
26	Egypt	Africa	(1987-1988, 1991-1993, 1996-1998)	(1993-1996)			
27	El Salvador	Central America	(1990-2000, 2009-2010)				
28	Fiji						
29	Gabon	Africa	(1986-1995, 2000-2002, 2004-2005, 2007-2010)	(1995-1999)			
30	Gambia	Africa	(1984-1987)		(1988-1991, 1998-2005, 2007-2010)	(1986-1988)	
31	Ghana	Africa	(1983-1987)	(1987-1988)	(1988-1992, 1995-2006, 2009-2010)	(1987-1988)	
32	Guatemala	Central America	(1983-1984, 1988-1990, 1992-1994, 2002-2004, 2009-2010)				
33	Guyana	South America	(1986-1988)		(1991-2004, 2007-2010)	(1987-1990)	
34	Haiti		(1983-1985, 1989-1990, 1995-1996)		(1996-1999, 2006-2010)	(1986-1989)	
35	Honduras	Central America	(1990-1992, 2008-2009)		(1992-1997, 1999-2002, 2004-2007)		

36	India	Asia	(1991-1993)	(1983-1984)				
37	Indonesia	Asia	(1997-1998)	(1998-2003)				
38	Iran	Asia						
39	Iraq	Asia	(2005-2010)					
40	Jamaica		(1984-1992, 2010)	(1992-1996)				
41	Jordan	Asia	(1989-1994, 2002-2004)	(1994-2002)				
42	Kenya	Africa	(1983-1986, 1988-1989)		(1989-1994, 1996-2007)	(1988-1989)		
43	Lao People's Democratic Republic	Asia			(1993-1997, 2001-2005)	(1989-1992)		
44	Lesotho	Africa	(1994-1997)		(1991-1994, 2001-2004, 2010)	(1988-1991)		
45	Libya	Africa						
46	Malawi	Africa	(1988-1989, 1994-1995)	(1983-1986)	(1988-1994, 1995-2008, 2010)		(2008- 2009)	
47	Malaysia	Asia						
48	Maldives	Asia	(2009-2010)				(2009- 2010)	
49	Mali	Africa	(1983-1990)		(1992-2010)	(1988-1991)		
50	Mauritania	Africa	(1985-1988)		(1989-2004, 2006-2010)	(1986-1989)		
51	Mauritius	Africa	(1983-1986)					
52	Mexico		(1986-1988, 1995-1997, 1999-2000)	(1983-1985, 1989-1993)				(2009- 2010)
53	Mongolia	Asia	(1991-1992, 2009-2010)		(1993-2005)			
54	Morocco	Africa	(1983-1993)					
55	Mozambique	Africa			(1990-2007)	(1987-1990)	(2009- 2010)	
56	Namibia	Africa						
57	Nepal	Asia	(1985-1987)		(1992-1995, 2003-2007)	(1987-1990)		
58	Nicaragua	Central America	(1991-1993)		(1994-2010)			
59	Niger	Africa	(1983-1987, 1994-1995)		(1988-1991, 1996-2010)	(1986-1988)		

<b>60</b>	Pakistan	Asia	(1988-1990, 1993-1997, 2000-2001, 2008-2010)	(1994-1995, 1997-2000)	(1994-1995, 1997-2004)	(1988-1991)		
<b>61</b>	Panama	Central America	(1983-1987, 1992-1997, 2000-2002)	(1997-2000)				
<b>62</b>	Papua New Guinea		(1990-1992, 1995-1997, 2000-2001)					
<b>63</b>	Paraguay	South America	(2003-2008)					
<b>64</b>	Peru	South America	(1984-1985, 2001-2009)	(1993-2001)				
<b>65</b>	Philippines	Asia	(1984-1988, 1991-1993, 1998-2000) (1991-2006, 2009-2010)	(1989-1991, 1994-1998)				
<b>66</b>	Romania							
<b>67</b>	Rwanda	Africa			(1998-2009)	(1991-1994)		
<b>68</b>	Senegal	Africa	(1983-1988, 1994)		(1988-1992, 1994-2006)	(1986-1988)	(2008-2010)	
<b>69</b>	Sierra Leone	Africa	(1984-1987)		(1994-1998, 2001-2010)	(1986-1989, 1994-1995)		
<b>70</b>	South Africa	Africa						
<b>71</b>	Sri Lanka	Asia	(1983-1984, 2001-2002, 2009-2010)	(2003-2006)	(1991-1995, 2003-2006)	(1988-1991)		
<b>72</b>	Sudan	Africa	(1984-1985)					
<b>73</b>	Swaziland	Africa						
<b>74</b>	Syrian Arab Pepublic	Asia						
<b>75</b>	United Republic Of Tanzania	Africa	(1986-1988)		(1991-1994, 1996-2007)	(1987-1990)		
<b>76</b>	Thailand	Asia	(1985-1986, 1997-2000)					
<b>77</b>	Togo	Africa	(1984-1989)		(1989-1998, 2008-2010)	(1988-1989)		
<b>78</b>	Tonga							
<b>79</b>	Tunisia	Africa	(1986-1988)	(1988-1992)				
<b>80</b>	Turkey		(1984-1985, 1994-1996, 1999-2008)					
<b>81</b>	Uganda	Africa	(1983-1984)		(1989-2006)	(1987-1989)		



<b>82</b>	Uruguay	South America	1983-1987, 1990-1993, 1996-2006)					
<b>83</b>	Venezuela	South America	(1996-1997)	(1989-1993)				
<b>84</b>	Vietnam	Asia	(1993-1994)		(1994-1997, 2001-2004)			
<b>85</b>	Zambia	Africa	(1984-1987)		(1995-2010)	(1995-1996)		
<b>86</b>	Zimbabwe	Africa	(1983-1984, 1998-2000)	(1992-1995)	(1992-1995)			
	Total number of loan programs:		69	25	39	27	4	2
	Percentage of total number of loan programs:		80,23%	29,10%	45,35%	31,40%	4,65%	2,33%

## Appendix B – Tests

**Table 7 – Results for test for non-stationary data**

	GDP		K		Edu		Fert		Open		Life	
Method	Statistic	Prob.*	Statistic	Prob.*	Statistic	Prob.*	Statistic	Prob.*	Statistic	Prob.*	Statistic	Prob.*
Individual intercept												
Null: Unit root (assumes common unit root process)												
Levin, Lin & Chu t*	91,162	1,000	337,541	1,000	416,757	1,000	438,077	1,000	21,352	1,000	264,373	1,000
Null: Unit root (assumes individual unit root process)												
Im, Pesaran and Shin W-stat	-36,858	0,000	-5,329	0,000	-4,026	0,000	1,858	0,968	-39,456	0,000	-7,145	0,000
ADF - Fisher Chi-square	1484,940	0,000	278,519	0,000	251,190	0,000	251,370	0,000	1631,700	0,000	412,027	0,000
PP - Fisher Chi-square	2101,510	0,000	1919,400	0,000	1777,750	0,000	1858,200	0,000	2528,840	0,000	1846,630	0,000
Individual intercept and time trend												
Null: Unit root (assumes common unit root process)												
Levin, Lin & Chu t*	112,791	1,000	565,855	1,000	927,313	1,000	921,371	1,000	32,381	1,000	630,656	1,000
Breitung t-stat	-19,657	0,000	-7,624	0,000	-10,541	0,000	8,002	1,000	-14,126	0,000	9,559	1,000
Null: Unit root (assumes individual unit root process)												
Im, Pesaran and Shin W-stat	-34,192	0,000	-2,567	0,005	-0,176	0,430	10,580	1,000	-36,454	0,000	8,284	1,000
ADF - Fisher Chi-square	1432,060	0,000	227,252	0,003	152,554	0,854	121,446	0,999	1421,970	0,000	693,010	0,000
PP - Fisher Chi-square	16909,70	0,000	19091,60	0,000	20089,90	0,000	19042,00	0,000	11440,70	0,000	18774,70	0,000

Non-stationary data can create a false correlation, as variables grow with time. By using unit root tests a non-time dependent correlation between the variables can be detected and the null-hypothesis (contains a unit root process) can be rejected (Brooks 2008, p. 327). The results of the tests are shown in Table 7, where the upper part of the table shows the results when the test are allowing for an individual intercept, while the lower part shows the results when the tests are allows for both an individual intercept and a time trend.

The LLC (Levin, Lin and Chu) test assumes a common unit root process, and is more restrictive than the other tests performed. This test assumes an alternative hypothesis saying that all the series must be stationary to be able to reject the null-hypothesis, compared to the other tests where only one series need to be stationary (Harris & Sollis 2003, p. 191-193). Evaluating the results of this test using the p-values, the null-hypothesis cannot be rejected for any of the variables. Due to the restrictive characteristics of this test the results are complemented with other tests.

The other three tests have a null-hypothesis assuming individual unit-root process. The IPS (Im, Pesaran and Shin) test rejects the null-hypothesis for all the variables, except fertility rate. The ADF (Augmented Dickey Fuller) and PP (Phillips-Perron) tests reject the null hypothesis for all the variables at the one percentage level (Harris & Sollis 2003, p. 196, Brooks 2008, p. 330-331).

When the tests are allowing for individual intercepts and time trends, the LLC test again shows the same results and is not able to reject the null-hypothesis for any of the variables. Using the UB (Breitung) test a common unit root process is assumed and the null-hypothesis is rejected for all the variables, except for fertility rate and life expectancy. The IPS test rejects the null-hypothesis for GDP per capita, the stock of capital and openness, but not for education, fertility rate and life expectancy. The ADF test rejects all the null-hypothesis for all the variables, except education and fertility rate. Finally, the PP test rejects the null hypothesis for all the variables.

In summary, the results three of the variables; GDP per capita, the capital stock and openness, are concluded to be stationary according to all tests, except for the LLC and UB tests. The deviating results of the UB test can be explained by the fact that this test only involves a constant (i.e. no fixed effects) (Harris & Sollis 2003, p. 195). While the restrictive character of the LLC test and its consistent inability to reject the null-hypothesis for any of the variables yields implausible results. For the other variables; the fertility rate and education, the tests yield inconclusive results. This can be due to the different assumptions of the tests. Both of the PP tests reject the null-hypothesis for all the variables,

while the ADF and IPS test results are not as straight forward. The IPS is a generalisation of the LLC test, due to the relaxed alternative null hypothesis of the test (Harris & Sollis 2003, p. 196). However, the IPS test also suffers from the same problems as the LLC test, the loss of power from using fixed effects, which can lead to under-rejection of the null hypothesis when it is false (Harris & Sollis 2003, p. 196). The ADF test is similar to the PP test, but it does not incorporate an automatic correction that allows for autocorrelated residuals (Brooks 2008, p. 330-331).

**Table 8 – Results for test of heteroskedasticity**

White's test for heteroskedasticity	
Null-hypothesis: homoscedasticity	
Chi-statistic	435.56
Critical value	18.31

Heteroskedasticity is a common issue in cross-sectional models. It occurs when the variance of the error terms vary across the sample. In other words the error term changes with explanatory variables (Hill et al. 2008, p. 198-199). To investigate the error terms a White's test is performed, and the results of the test are shown in Table 8. The test is evaluated by calculating the chi-statistic:  $R^2 \times \text{number of observations}$ . The null-hypothesis (homoscedasticity) is rejected if the calculated chi-statistic is greater than the critical value, using ten degrees of freedom at the five-percentage level of significance. Heteroskedasticity was detected and resolved by using White's standard errors (diagonal).

After logging and differentiating the variables all equations were ran, with White's robust standard errors correcting for heteroskedasticity. To examine if the residuals suffer from autocorrelation an evaluation of the Durbin-Watson (D-W) statistics is made using the Durbin-Watson test. The results are shown in Table 9. The null-hypothesis can only be rejected if the D-W value is lower than the lower critical value. It is not rejected if the D-W value is greater than the upper critical D-W value (Doughty 2011, p. 436-437). The critical value is obtained with six parameters and 100 observations at the five percentage level of significance. None of the D-W statistics reject the null-hypothesis. However, there is always a risk that some autocorrelation is left which has to be taken into account in the analysis of the results.

**Table 9 – Results for test of autocorrelation**

Durbin-Watson's test for autocorrelation				
Null-hypothesis: no autocorrelation				
	OLS	2SLS	D-W lower	D-W upper
Model 1				
Equation 1	1.92	1.92	1.57	1.78
Equation 2	1.93	1.93	1.57	1.78
Equation 3	1.95	1.95	1.57	1.78
Model 2				
Equation 1	1.92	1.92	1.57	1.78
Equation 2	1.93	1.93	1.57	1.78
Equation 3	1.96	1.96	1.57	1.78
Model 3				
Equation 1	1.92	1.92	1.57	1.78
Equation 2	1.93	1.93	1.57	1.78
Model 4				
Equation 1	1.92	1.92	1.57	1.78
Equation 2	1.93	1.92	1.57	1.78
Equation 3	1.95	1.95	1.57	1.78

## Appendix C – Description of variables

Variable	Source	Description
GDP	Penn World Table (2012)	Name of series: “PPP Converted GDP Per Capita (Laspeyres), derived from growth rates of c, g, i, at 2005 constant prices”. The variable is logged and differentiated.
K	Penn World Table (2012), Hall & Jones (1999)	To calculate the stock of capital data on investments is used (Series: “Investment Share of PPP Converted GDP Per Capita at 2005 constant prices [rgdpl]”). Two formulas are applied: $K_{t-1} = \frac{I_t}{0.05 + g_I}$ and $K_t = ((1-0.05)*K_{t-1}) + I_t$ where d is the depreciation of capital which is set at 5% and $g_I$ is the average growth rate of investments during 1970-1980.  The variable is logged and differentiated. For Central African Republic, Nicaragua and Papua New Guinea the average growth of investments during 1970-1980 was negative and we therefore got a negative value of the capital stock. The growth rate was therefore corrected to 0.
Edu	Barro & Lee (2013)	Name of series: “Avg. Years of Total Schooling (15 years of age and above)”. The variable was logged and differentiated. The variable was interpolated, from five-year based observations to yearly basis.
Fert	The World Bank (2013b)	Name of series: “Fertility rate, total (births per woman)”. The variable is logged and differentiated.
Open	Penn World Table (2012)	Name of series: “Openness at 2005 constant prices (%)”. The variable was only differentiated, since it was already a percentage share.
Life	The World Bank (2013c)	Name of series: “Life expectancy at birth, total (years)”. The variable is logged and differentiated.
IMF	Se appendix 1	The dummy takes the value of 1 for every year received a disbursement and 0 otherwise.
IMF80 <sup>16</sup>	Se appendix 1	The dummy takes the value of 1 for every year received a disbursement and 0 otherwise.
IMF90	Se appendix 1	The dummy takes the value of 1 for every year received a disbursement and

<sup>16</sup> Even though representing the 1980 decade, this dummy only include observations from 1983-1989 because of the insufficient data on loan disbursement.

		0 otherwise.
IMF00	Se appendix 1	The dummy takes the value of 1 for every year received a disbursement and 0 otherwise.
SBA	Se appendix 1	The dummy takes the value of 1 for every year received a disbursement and 0 otherwise.
EFF	Se appendix 1	The dummy takes the value of 1 for every year received a disbursement and 0 otherwise.
ECF	Se appendix 1	The dummy takes the value of 1 for every year received a disbursement and 0 otherwise.
SAF	Se appendix 1	The dummy takes the value of 1 for every year received a disbursement and 0 otherwise.
ESF	Se appendix 1	The dummy takes the value of 1 for every year received a disbursement and 0 otherwise.
FCL	Se appendix 1	The dummy takes the value of 1 for every year received a disbursement and 0 otherwise.
Africa	Se appendix 1	The dummy takes the value of 1 for every year received a disbursement and 0 otherwise.
Asia	Se appendix 1	The dummy takes the value of 1 for every year received a disbursement and 0 otherwise.
South America	Se appendix 1	The dummy takes the value of 1 for every year received a disbursement and 0 otherwise.

## Appendix D – Descriptive data

	<b>GDP</b>	<b>GDPgr</b>	<b>K</b>	<b>Edu</b>	<b>Fert</b>	<b>Open</b>	<b>Life</b>
Mean	3409,90	0,00	447,49	5,04	4,70	65,99	60,26
Median	2511,98	0,02	364,60	4,90	4,83	57,64	60,83
Maximum	19372,44	2,03	8849,91	11,07	8,29	351,94	79,19
Minimum	160,80	-3,55	20,18	0,21	1,09	3,78	26,82
Std. Dev.	2871,84	0,24	513,77	2,43	1,74	41,25	10,26
Observations	3526	3525	3526	3526	3526	3526	3526



## Appendix E – The regression results

Model 1	1		2		3		Model 2	1		2		3	
	OLS	2SLS	OLS	2SLS	OLS	2SLS		OLS	2SLS	OLS	2SLS	OLS	2SLS
K	0.265**	0.263**	0.265**	0.263**	0.265**	0.263**	K	0.264**	0.271**	0.264**	0.271**	0.264**	0.271**
s.e.	(0.125)	(0.125)	(0.125)	(0.125)	(0.125)	(0.125)	s.e.	(0.125)	(0.126)	(0.125)	(0.126)	(0.125)	(0.126)
K(-1)			0.059	0.058	0.059	0.058	K(-1)			0.066	0.082	0.066	0.082
s.e.			(0.082)	(0.082)	(0.082)	(0.082)	s.e.			(0.082)	(0.082)	(0.082)	(0.082)
K(-2)					-0.014	-0.014	K(-2)					0.000	-0.005
s.e.					(0.086)	(0.086)	s.e.					(0.087)	(0.088)
Edu	0.082	0.047	0.082	0.047	0.082	0.047	Edu	0.081	0.047	0.081	0.047	0.081	0.047
s.e.	(0.108)	(0.108)	(0.108)	(0.108)	(0.108)	(0.108)	s.e.	(0.108)	(0.109)	(0.108)	(0.109)	(0.108)	(0.109)
Edu(-1)			-0.040	-0.055	-0.040	-0.055	Edu(-1)			-0.042	-0.073	-0.042	-0.073
s.e.			(0.114)	(0.1115)	(0.114)	(0.1115)	s.e.			(0.114)	(0.117)	(0.114)	(0.117)
Edu(-2)					-0.067	-0.070	Edu(-2)					-0.076	-0.084
s.e.					(0.114)	(0.114)	s.e.					(0.115)	(0.116)
Fert	0.213**	0.231**	0.213**	0.231**	0.213**	0.231**	Fert	0.218**	0.237**	0.218**	0.237**	0.218**	0.237**
s.e.	(0.093)	(0.094)	(0.093)	(0.094)	(0.093)	(0.094)	s.e.	(0.093)	(0.094)	(0.093)	(0.094)	(0.093)	(0.094)
Fert(-1)			0.201**	0.208**	0.201**	0.208**	Fert(-1)			0.206**	0.227**	0.206**	0.227**
s.e.			(0.095)	(0.094)	(0.095)	(0.094)	s.e.			(0.095)	(0.096)	(0.095)	(0.096)
Fert(-2)					0.109	0.110	Fert(-2)					0.120	0.131
s.e.					(0.086)	(0.086)	s.e.					(0.087)	(0.088)
Open	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	Open	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001
s.e.	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	s.e.	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Open(-1)			0.001**	0.001**	0.001**	0.001**	Open(-1)			0.001**	0.001**	0.001**	0.001**
s.e.			(0.000)	(0.000)	(0.000)	(0.000)	s.e.			(0.000)	(0.000)	(0.000)	(0.000)
Open(-2)					0.000	0.000	Open(-2)					0.000	0.000
s.e.					(0.000)	(0.000)	s.e.					(0.000)	(0.000)

Life	0.025	0.012	0.025	0.012	0.025	0.012	Life	0.013	0.008	0.013	0.008	0.013	0.008
s.e.	(0.322)	(0.322)	(0.322)	(0.322)	(0.322)	(0.322)	s.e.	(0.325)	(0.327)	(0.325)	(0.327)	(0.325)	(0.327)
Life(-1)			0.242	0.236	0.242	0.236	Life(-1)			0.242	0.244	0.242	0.244
s.e.			(0.253)	(0.254)	(0.253)	(0.254)	s.e.			(0.254)	(0.255)	(0.254)	(0.255)
Life(-2)					0.391	0.389	Life(-2)					0.394	0.365
s.e.					(0.347)	(0.348)	s.e.					(0.344)	(0.342)
IMF	0.008***	0.019***	0.008***	0.019***	0.008***	0.019***	IMF80	0.005	0.021**	0.005	0.021**	0.005	0.021**
s.e.	(0.003)	(0.004)	(0.003)	(0.004)	(0.003)	(0.004)	s.e.	(0.005)	(0.009)	(0.005)	(0.009)	(0.005)	(0.009)
IMF(-1)			0.012***	0.018***	0.012***	0.018***	IMF80(-1)			0.015***	0.036***	0.015***	0.036***
s.e.			(0.003)	(0.004)	(0.003)	(0.004)	s.e.			(0.005)	(0.010)	(0.005)	(0.010)
IMF(-2)					0.012***	0.013***	IMF80(-2)					0.022***	0.019*
s.e.					(0.003)	(0.005)	s.e.					(0.006)	(0.010)
Constant	0.012***	0.008*	0.011***	0.009**	0.010***	0.010***	IMF90	0.006	0.016	0.006	0.016	0.006	0.016
s.e.	(0.004)	(0.004)	(0.003)	(0.004)	(0.003)	(0.004)	s.e.	(0.006)	(0.010)	(0.006)	(0.010)	(0.006)	(0.010)
							IMF90(-1)			0.008	0.000	0.008	0.000
							s.e.			(0.006)	(0.009)	(0.006)	(0.009)
							IMF90(-2)					0.002	-0.005
							s.e.					(0.005)	(0.009)
							IMF00	0.011***	0.020***	0.011***	0.020***	0.011***	0.020***
							s.e.	(0.004)	(0.006)	(0.004)	(0.006)	(0.004)	(0.006)
							IMF00(-1)			0.013***	0.022***	0.013***	0.022***
							s.e.			(0.004)	(0.006)	(0.004)	(0.006)
							IMF00(-2)					0.015***	0.027***
							s.e.					(0.004)	(0.006)
							Constant	0.012***	0.008*	0.012***	0.012***	0.011***	0.012***
							s.e.	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)
Observations	2408	2408	2408	2408	2408	2408	Observations	2408	2408	2408	2408	2408	2408
R-squared	0.133	0.129	0.135	0.134	0.127	0.127	R-squared	0.133	0.129	0.135	0.128	0.130	0.128

Number of countries	86	86	86	86	86	86	Number of countries	86	86	86	86	86
---------------------	----	----	----	----	----	----	---------------------	----	----	----	----	----

Significance levels: \* p<0.10; \*\* p<0.05; \*\*\* p<0.01

Coefficients and standard errors in parentheses are reported

Model 3	1		2			Model 4	1		2		3	
	OLS	2SLS	OLS	2SLS			OLS	2SLS	OLS	2SLS	OLS	2SLS
K	0.240*	0.262**	0.240*	0.262**		K	0.257**	0.258**	0.257**	0.258**	0.257**	0.258**
s.e.	(0.124)	(0.127)	(0.124)	(0.127)		s.e.	(0.125)	(0.126)	(0.125)	(0.126)	(0.125)	(0.126)
K(-1)			0.058	0.064		K(-1)			0.056	-0.057	0.056	-0.057
s.e.			(0.083)	(0.085)		s.e.			(0.082)	(0.082)	(0.082)	(0.082)
K(-2)						K(-2)					-0.015	-0.013
s.e.						s.e.					(0.086)	(0.087)
Edu	0.110	0.076	0.110	0.076		Edu	0.083	0.057	0.083	0.057	0.083	0.057
s.e.	(0.106)	(0.108)	(0.106)	(0.108)		s.e.	(0.107)	(0.107)	(0.107)	(0.107)	(0.107)	(0.107)
Edu(-1)			-0.028	-0.028		Edu(-1)			-0.036	-0.047	-0.036	-0.047
s.e.			(0.114)	(0.144)		s.e.			(0.114)	(0.114)	(0.114)	(0.114)
Edu(-2)						Edu(-2)					-0.065	-0.066
s.e.						s.e.					(0.114)	(0.114)
Fert	0.221**	0.226**	0.221**	0.226**		Fert	0.211**	0.212**	0.211**	0.212**	0.211**	0.212**
s.e.	(0.095)	(0.097)	(0.095)	(0.097)		s.e.	(0.092)	(0.094)	(0.092)	(0.094)	(0.092)	(0.094)
Fert(-1)			0.201**	0.220**		Fert(-1)			0.187*	0.192**	0.187*	0.192**
s.e.			(0.098)	(0.100)		s.e.			(0.097)	(0.097)	(0.097)	(0.097)
Fert(-2)						Fert(-2)					0.010	0.102
s.e.						s.e.					(0.088)	(0.088)
Open	-0.001	-0.001	-0.001	-0.001		Open	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001
s.e.	(0.001)	(0.001)	(0.001)	(0.001)		s.e.	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Open(-1)			0.001**	0.001**		Open(-1)			0.001**	0.001**	0.001**	0.001**
s.e.			(0.000)	(0.000)		s.e.			(0.000)	(0.000)	(0.000)	(0.000)

Open(-2)					Open(-2)					0.000	0.000
s.e.					s.e.					(0.000)	(0.000)
Life	-0.016	0.010	-0.016	0.010	Life	0.018	0.019	0.018	0.019	0.018	0.019
s.e.	(0.333)	(0.340)	(0.333)	(0.340)	s.e.	(0.323)	(0.320)	(0.323)	(0.320)	(0.323)	(0.320)
Life(-1)			0.240	0.215	Life(-1)			0.248	0.251	0.248	0.251
s.e.			(0.255)	(0.262)	s.e.			(0.253)	(0.253)	(0.253)	(0.253)
Life(-2)					Life(-2)					0.401	0.404
s.e.					s.e.					(0.345)	(0.345)
SBA	-0.000	0.013**	-0.000	0.013**	Africa	0.016***	0.014	0.016***	0.014	0.016***	0.014
s.e.	(0.003)	(0.005)	(0.003)	(0.005)	s.e.	(0.005)	(0.009)	(0.005)	(0.009)	(0.005)	(0.009)
SBA(-1)			0.009**	0.019***	Africa(-1)			0.007	0.006	0.007	0.006
s.e.			(0.003)	(0.006)	s.e.			(0.005)	(0.009)	(0.005)	(0.009)
SBA(-2)					Africa(-2)					0.004	0.000
s.e.					s.e.					(0.005)	(0.009)
EFF	0.002	0.010	0.002	0.010	Asia	-0.005	0.005	-0.005	0.005	-0.005	0.005
s.e.	(0.005)	(0.006)	(0.005)	(0.006)	s.e.	(0.006)	(0.008)	(0.006)	(0.008)	(0.006)	(0.008)
EFF(-1)			0.004	0.001	Asia(-1)			0.005	0.017**	0.005	0.017**
s.e.			(0.004)	(0.012)	s.e.			(0.006)	(0.007)	(0.006)	(0.007)
EFF(-2)					Asia(-2)					0.013**	0.019***
s.e.					s.e.					(0.005)	(0.007)
ECF	0.016***	0.016**	0.016***	0.016**	South America	0.005	0.023***	0.005	0.023***	0.005	0.023***
s.e.	(0.005)	(0.006)	(0.005)	(0.006)	s.e.	(0.004)	(0.006)	(0.004)	(0.006)	(0.004)	(0.006)
ECF(-1)			0.011**	0.013**	South America(-1)			0.016***	0.023***	0.016***	0.023***
s.e.			(0.004)	(0.006)	s.e.			(0.004)	(0.006)	(0.004)	(0.006)
ECF(-2)					South America(-2)					0.016***	0.018***
s.e.					s.e.					(0.004)	(0.006)
SAF	0.003	0.009	0.003	0.009	Constant	0.011***	0.009**	0.012***	0.011***	0.012***	0.018***
s.e.	(0.012)	(0.020)	(0.012)	(0.020)	s.e.	(0.004)	(0.004)	(0.004)	(0.004)	(0.003)	(0.004)
SAF(-1)			0.004	-0.005							

s.e.			(0.014)	(0.021)							
SAF(-2)											
s.e.											
ESF	-0.010	-0.013	-0.010	-0.013							
s.e.	(0.020)	(0.036)	(0.020)	(0.036)							
ESF(-1)			-0.008	0.003							
s.e.			(0.024)	(0.061)							
ESF(-2)											
s.e.											
FCL	-0.012	0.019*	-0.012	0.019*							
s.e.	(0.020)	(0.011)	(0.020)	(0.011)							
FCL(-1)			0.004	-0.745							
s.e.			(0.015)	(2.205)							
FCL(-2)											
s.e.											
Constant	0.012***	0.009**	0.012***	0.009**							
s.e.	(0.004)	(0.004)	(0.004)	(0.004)							
Observations	2408	2408	2408	2408	Observations	2408	2408	2408	2408	2408	2408
R-squared	0.135	0.130	0.134	0.039	R-squared	0.134	0.130	0.134	0.132	0.126	0.126
Number of countries	86		86	86	Number of countries	86	86	86	86	86	86

Significance levels: \* p<0.10; \*\* p<0.05; \*\*\* p<0.01  
Coefficients and standard errors in parentheses are reported

## Appendix F – Specified regression models

The general model tested is:

$$\Delta \ln(y_{it}) = \beta_1 \Delta \ln(k_{it}) + \beta_2 \Delta \ln(\text{edu}_{it}) + \beta_3 \Delta \ln(\text{fert}_{it}) + \beta_4 \Delta (\text{open}_{it}) + \beta_5 \Delta \ln(\text{life}_{it}) \\ + \beta_6 \Delta \ln(\text{tfp}_{it}) + \varepsilon_{it}$$

$$\varepsilon_{it} = \lambda_i + f_t + \eta_{it}$$

where  $y_{it}$  represents GDP per capita growth in country  $i$  at period  $t$ .  $\text{tfp}_{it}$  represents the groups of dummy variables tested in each of the four models.

The specific models tested are:

$$\text{Model 1: } \Delta \ln(y_{it}) = \beta_1 \Delta \ln(X'_{it}) + \beta_2 (\text{IMF}_{it}) + \varepsilon_{it}$$

where  $X'_{it}$  is a vector containing all the control variables and  $\text{IMF}_{it}$  is the dummy variable representing the overall effect of IMF participation on growth.

$$\text{Model 2: } \Delta \ln(y_{it}) = \beta_1 \Delta \ln(X'_{it}) + \beta_2 (1980_{it}) + \beta_3 (1990_{it}) + \beta_4 (2000_{it}) + \varepsilon_{it}$$

where  $1980_{it}$ ,  $1990_{it}$  and  $2000_{it}$  are dummy variables representing each decade.

$$\text{Model 3: } \Delta \ln(y_{it}) = \beta_1 \Delta \ln(X'_{it}) + \beta_2 (\text{SBA}_{it}) + \beta_3 (\text{ECF}_{it}) + \beta_4 (\text{EFF}_{it}) + \beta_5 (\text{SAF}_{it}) + \\ \beta_6 (\text{ESF}_{it}) + \beta_7 (\text{FCL}_{it}) + \varepsilon_{it}$$

where  $\text{SBA}_{it}$ ,  $\text{ECF}_{it}$ ,  $\text{EFF}_{it}$ ,  $\text{SAF}_{it}$ ,  $\text{ESF}_{it}$  and  $\text{FCL}_{it}$  are dummy variables representing each lending arrangement.

$$\text{Model 4: } \Delta \ln(y_{it}) = \beta_1 \Delta \ln(X'_{it}) + \beta_2 (\text{Africa}_{it}) + \beta_3 (\text{Asia}_{it}) + \beta_4 (\text{South America}_{it}) + \varepsilon_{it}$$

where  $\text{Africa}_{it}$ ,  $\text{Asia}_{it}$  and  $\text{South America}_{it}$  are dummy variables representing each region.