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Factors Affecting Economic Growth in Developing Countries

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Cover Page Footnote

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ABSTRACT. This paper aims to identify the factors affecting economic growth in developing countries. It uses cross-country data for 76 countries from 2010, 2005, 2000, and 1995. A high volume of exports, plentiful natural resources, longer life expectancy, and higher investment rates have positive impacts on the growth of per capita gross domestic product in developing countries. Much research needs to be done to distinguish the causes of growth in developing countries, as the scope of existing research is limited due to a lack of reliable data.

I. Introduction

Economists have used both theory and empirical research to explain the cause of economic growth. People like Solow, Swann, and Romer have provided theoretical frameworks on which most later works are based. Following their work, Barro, and Sala-i-Martin have conducted extensive empirical work to test established hypotheses. This study will employ the empirical model of economic growth proposed by Barro (1996), and use newer data to test whether the theory of economic growth that held true for most of the countries in his sample will hold true for a set of developing countries.

There has been minimal empirical work that specifically looks into factors that determine growth in developing economies in recent years. Since growth is a very dynamic process, studies that are based on cases hundreds of years ago might not be as relevant now. The technological changes in the last few decades have revolutionized the way countries improve their economy. This study will help motivate more research and case studies on developing countries from which other countries can learn and benefit. Thus, this study has policy implications.

This study attempted to find the factors that determine economic growth in developing countries. Also, it compared whether the factors that affect growth of developed countries were the same for developing countries. Using an Ordinary Least Squares regression, the data showed that, to a certain extent, the factors that affect economic growth were consistent overall. It also found that a lack of reliable data had made the

process daunting, but also opened room for many future opportunities. More empirical research on developing countries should be conducted.

II. Literature Review

Robert Barro (1996) studied a panel of 100 countries from 1960 to 1990 to find the factors that affected the economic growth of countries. He found that the growth rate of real per capita GDP was associated with maintenance of the rule of law, smaller government consumption, longer life expectancy, more male secondary and higher levels of schooling, lower fertility rates, higher levels of investment, the level of democracy, a lower inflation rate, and openness to trade. He also emphasized the theory of convergence, which implies that as the real GDP level rises, the growth rate falls. Barro's sample of 100 countries included 18 countries from Sub-Saharan Africa, 22 from Latin America, and 18 from Asia of all economic levels, but included very few developing countries (i.e. the poorest countries). Many of these countries were excluded from the sample because data was missing.

Despite international aid and support, developing countries were not able to grow and prosper because of economic traps. The traps include conflicts or wars, rent seeking on natural resources, dependence on only one neighboring country, and lack of the rule of law (Collier, 2007). Although real per capita GDP growth of developing countries was higher than the world average, they had low levels of socio-economic conditions. It was partly due to weak institutions, low human and physical capital, conflicts, poverty, a low level of productivity, lack of international trade, and heavy reliance on external help. Since they had a low level of real per capita GDP, the theory of convergence, "catching up," should hold true. In fact it seemed to, because despite all the problems, they had higher growth rates compared to developed countries.

Foreign direct investment (FDI) has been a big source of external funding in developing and developed countries. The impact of FDI on economic growth has been extensively discussed in economic research. There have been both positive and negative analysis of FDI on economic growth. Most economists and policymakers believe that FDI stimulates development in investment in technology, increases the capital stock, and increases employment. Some worry, however, that it has a crowding out effect on domestic investment and eliminates competition in the local markets.

Caves (1971) found that there was a positive correlation between the productivity of a multinational enterprise and labor productivity in domestic firms in the same industry. He claimed that this was a result of competition and continuous improvement brought by foreign investment to the domestic market. Foreign direct investment may also have benefits not only to the industry that receives the investments but also to other domestic industries that gain from spillover effects of improved human capital and technological improvement (Rappaport, 2000). Foreign direct investment benefits a host country through added employment, new technology and transfer of knowledge. Also, it causes an increase in the volume of domestic investment (Borensztein, De Gregorio, and Lee 1998).

Foreign direct investment (FDI) may also have negative effects on the recipient country. Foreign firms may invest capital only on what they think is productive. It drives away domestic firms, which lowers the welfare of the nation (Hanson, 2001). While there had been a lot of talk about spillover effects from foreign direct investment in previous studies, Aitekn and Harrison (1999) did not find any evidence of beneficial spillover effects from foreign firms to domestic ones in Venezuela over the period 1979-1989. Also, Mansfield and Romeo (1980) did not find a positive effect of FDI on the rate of economic growth in Morocco, a developing country. So, while there is optimism for the role of FDI in economic growth, there is some pessimism as well. Therefore, it is important to discover how FDI affects the economies of the least developed countries.

International trade enhances the economy of both importing and exporting countries. There is a positive relationship between international trade and economic growth. Kavoussi (1984) found that higher rates of economic growth were strongly correlated with higher rates of export growth. He found that the positive correlation between exports and growth holds for both middle and low income countries. Sachs and Warner (1995) found that open developing economies outperformed closed developing economies every year in terms of real GDP growth. Even in poorer countries, openness to trade enhances growth in productivity, and thus, human capital (Harrison 1996). Least developed countries, however, are heavily dependent on primitive agriculture and are more vulnerable to shocks.

A country rich in natural resources can benefit from the production and sale of such wealth. Yet, even with abundant natural resources such as oil and diamonds, countries in Africa have not experienced substantial

GDP growth (Sachs and Warner, 1995). This may be because poor countries fall into the natural resource trap. For one thing, the export of the natural resource leads to an appreciation in the exchange rate, which makes their other exports more expensive. This is known as "Dutch Disease." Also, diverting human and physical capital from other industries to the production of natural resources shrinks other industries (Collier, 2007). In addition, natural resource sales fuel corruption and other rent-seeking behavior. Some of the developing countries in Sub-Saharan Africa are rich in natural resources and have a very low per capita GDP.

Kumar and Woo (2010) found a linear inverse relationship between initial debt and subsequent growth in a sample of emerging and advanced economics. The impact of high debt was smaller in developed economics. They also found that only very high levels of the debt-to-GDP ratio had significant negative effects on economic growth. Reinhart and Rogoff (2010) studied 20 developed economies for about two centuries and found that the negative relationship between growth and level of debt was very weak.

However, Clements, Bhattacharya and Nguyen (2003) found that the substantial reduction in the stock of external debt for highly indebted poor countries would directly increase per capita income growth by about one percentage point per annum. Gelos, Sahay and Sandleris (2010) concluded that only larger and wealthier countries had access to larger credit and borrowed larger amounts and more frequently.

Because of the inaccessibility of external credit, most of the developing countries relied on unilateral transfers of international funds for development. The World Bank Data (2015) reported that countries in the Organization for Economic Co-operation and Development (OECD) contributed about 130 billion US Dollars to developing countries as Official Development Assistant. Minoiu and Reddy (2009) found that development aid (as opposed to non-development aid) had positive and robust effects on subsequent growth. However, they suggested that such effects appeared after long time-lags. In the short run, such aid had no effects on growth and development.

An increase in life expectancy is directly related to the control of diseases and better health. Increases in life expectancy have a direct impact on population growth. A study by Acemoglu and Johnson (2006) cast doubt on the claim that unfavorable health conditions are the root cause of poverty in some countries, but agree that improvement in health conditions may lead to improvement in economic conditions. Another

study by Cervellati and Sunde (2009) predicted that improvements in life expectancy foster human capital accumulation and have an effect on income generation.

The level of education is widely accepted as a factor in economic growth. Barro (1999) found that an additional year of schooling increased the country's growth rate by 0.7 percent per year. Investment in human capital enhances the workforce's ability to work and increases productivity. Al Nassar (2007) noted that a worker's level of education was a measure of human capital and was directly related to productivity.

Corruption and poor governance hinders the economic health of countries. Mauro studied 67 countries and concluded that annual economic growth increased 1.3 percentage points where corruption was reduced by one standard deviation (Murro 1995). Poor countries that have people of different backgrounds, cultures, languages, and customs are more vulnerable to corruption. Empirical models can test these claims and see if they are true for both developing and developed economies.

III. Data and Method

Data were collected for the years 2010, 2005, 2000, and 1995 for 76 developing countries based on their GDP per capita level as of 2010. The data were cross sections for each year. The countries represented in this dataset were from Africa, Asia, Oceania, and the Americas. Some countries were land-locked, while some were small island countries. Countries included in the sample for this study are shown in Figure 1.

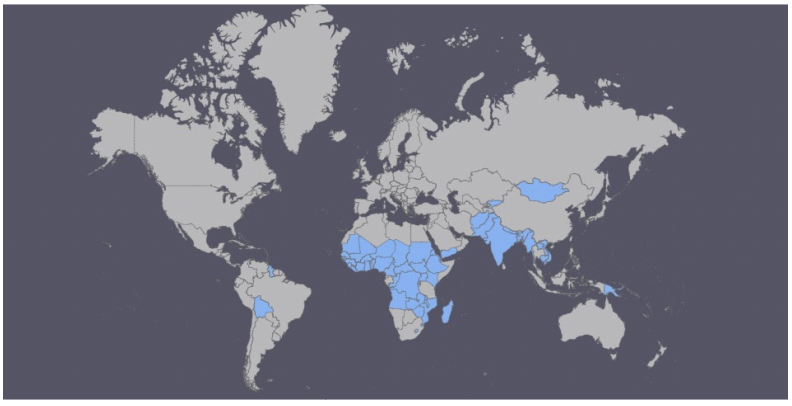

Figure 1. Developing countries

The list of developing countries was taken from the World Bank (2015). It included the World Bank's list of low-income and lower-middle income economies. The data on GDP per capita growth rate, GDP per capita, natural resource production, and life expectancy were taken from the World Bank (2015). Data on the volume of exports, government debt, and net foreign aid received were taken from the International Monetary Fund (2015). The data on investment rates and foreign direct investment inflows were taken from the Penn World Tables 8.0 (2015). Table 1 describes each of the variables, their units, and their predicted effects on economic growth.

TABLE 1–Variables, description, unit of variables and predicted signs

Variable name	Description	Unit	Predicted effect
GROWTH	GDP per capita growth	% per yr.	Dep. Variable
INITIALGDP	GDP per capita	$	-
EXPORT	Volume of Export	$	+
DEBT	Gov Debt	% of GDP	-
RESOURCE	Natural Resource Yield	% of GDP	+/-
AID	Net Foreign Aid Recd.	USD	-
LIFE	Life Expectancy	Years	+
INVEST	Investment rate	% of GDP	+
FDI	FDI Inflow	% of GDP	+

Once the data were collected, multiple Ordinary Least Squares regressions were used. This helped find the relationship between economic growth and other variables that were identified to have an impact on economic growth in previous studies. Each year was tested

separately and then compared with the other years to see if the results yielded were similar.

The proxy for economic growth was the growth rate of GDP per capita, which was the dependent variable. The indicator for this variable was GROWTH in the model. It was the percentage change in the per capita GDP from the previous year to the next. For example, GDP per capita growth for 2010 was the rate of change of GDP per capita from 2009 to 2010. Since countries could have had negative or positive growth in any interval, this value could have been negative or positive. A higher growth rate was desirable.

The first control variable was the starting level of GDP per capita denoted by INITIALGDP in the model. It is the per capita GDP of the year tested. The unit of this measure was constant 2005 purchasing power parity (PPP) dollars. Using purchasing power parity dollars controlled for differences in price levels in different countries. Including this variable in the statistical model controlled for the size of the economy. The theory of conditional convergence implied that bigger economies tended to expand slower than smaller economies. Including this variable controlled for such effects in our model. The predicted sign of the INITIALGDP was negative.

The second variable was volume of exports denoted by EXPORT. It was the constant 2005 purchasing power parity dollar amount of goods and services that the country exported in the calendar year. Economic theories suggest that higher exports mean more openness to trade, which implies higher gains. The expected sign of the coefficient was positive.

The third variable was the natural resources produced by the country for its own use or export, which was indicated by RESOURCE. The unit of this variable was the percentage of GDP. For example, if a country produced $10,000 worth of natural resources and the GDP of that country was $100,000, then RESOURCE would equal 10%. There have been different claims about whether production and sales of natural resources have positive or negative impacts on economic growth. The predicted sign of the coefficient was ambiguous since previous research concluded that the export of resources may have a positive effect, helping countries grow, or a negative effect due to the Dutch Disease and rent seeking.

The fourth variable was the government debt owed to its people and foreigners; it was indicated by DEBT. The unit of this variable was also percentage of GDP. Studies have found that a higher level of government debt was associated with administrative mismanagement, some level of

corruption, and high investment risk. So, the predicted sign for this variable was negative. However, there have been empirical counterexamples, as Japan was able to grow, at a slower rate, even with more than 200% of government debt (International Monetary fund 2015).

The fifth variable was the net foreign aid received by a country. It was represented by AID and the unit was nominal US dollars. While foreign aid was sent with good intentions, it hinted at economic problems in the receiving countries or dependence on others. Thus the predicted sign of the coefficient was negative.

The sixth variable was life expectancy, denoted by LIFE. The unit of LIFE was number of years. Higher life expectancy meant that the country had a better healthcare system, access to doctor and hospitals, and promoted a healthy lifestyle. Those things could have only been achieved with economic prosperity. Thus the predicted sign of coefficient of LIFE was positive.

The seventh variable was investment in the country, denoted by INVEST. The unit of INVEST was percentage of GDP. Investment was the amount spent on creation of capital goods. The predicted sign of INVEST was positive.

Finally, the eighth variable was foreign direct investment inflow into the country which was represented by FDI. The unit of FDI was also percentage of GDP. It was the amount foreign citizens or companies invested in the local economy. Foreigners' investment creates jobs and additional economic activity that benefits the local economy. Thus, the predicted sign of the coefficient of FDI was also positive.

After the data were collected and filtered, descriptive statistics were studied to understand the structure of the data. The descriptive statistics of 2010, shown in Table 2, provided a sample of how the data behaved. The average growth rate of the sample was about 5% per year with the highest of just under 14% for Chad and the lowest for Haiti of about -5.5% (Haiti suffered from a devastating earthquake in 2010). Eritrea's debt-to-GDP ratio was more than 140% and was the only country on this list to have more than 100%. Natural resources contributed the least to GDP in Tonga. Also, Angola was the only country that has a net outflow of foreign direct investment at the rate of -4%. *The Economist* reported that sub- Saharan countries have grown faster than any other groups since 1980s (2011), as indicated in Figure 2.

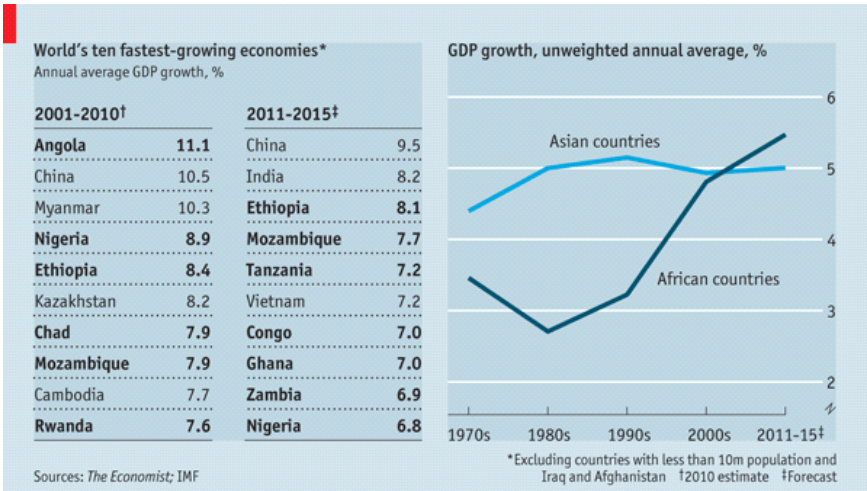

Figure 2. GDP growth of African and Asian Countries.
Source: The Economist

TABLE 2–Descriptive statistics for 2010

Variable	Mean	Standard Error	Minimum	Maximum
GROWTH	5.29	0.40	-5.50	13.55
INITIALGDP	2999.07	447.28	541.04	23410.22
EXPORT	10.87	3.34	-16.75	175.54
DEBT	43.53	3.09	9.96	143.77
RESOURCE	13.52	1.79	0.07	66.62
AID	11.74	2.15	0.17	127.28
LIFE	62.61	0.92	37.00	75.80
INVEST	25.77	1.39	9.30	71.45
FDI	5.63	1.05	-3.80	45.92

This dataset is imperfect because this was a cross-country study. Countries may have used different methods to collect the same kind of data using slightly different definitions (Harrison, 1996). Though it may have been imperfect, it was the best available data for this study. Even with standard international definitions, measures may still deviate. The results here were as reliable as possible.

In addition, some data for some countries were missing. This was corrected by eliminating that country from the model which reduced the size of sample. For example, data on life expectancy and GDP growth rate were missing for Afghanistan, so Afghanistan was not used in the analysis.

After the data were ready, the model used by Barro (1996) was modified in order to include the variables that the data was collected for. This model did acknowledge the existence of an autonomous error term that the included other variables. The Ordinary Least Squares model used in this study was as follows:

GROWTH = f (INITIALGDP, EXPORT, DEBT, RESOURCE, AID, LIFE, INVEST, FDI)

IV. Results and Interpretation

The regression results for the base year, 2010, are presented in Table 3. The sample size of the test was 57. While the test began with 76 countries, missing data limited the sample size to 57. All of the eight independent variables chosen in this experiment (initial GDP, volume of exports, external debt, natural resource yield, aid received, life expectancy, investment in the economy, and FDI) were significant.

The level of starting GDP per capita had a negative relationship with the growth rate. This is consistent with the convergence hypothesis as discussed earlier. However, the magnitude of the coefficient was very close to zero, which could be interpreted as not having any relationship with the level of growth. The p-value of INITIALGDP was very close to zero which indicated a very high statistical significance. As all the countries in our sample are developing countries, they do not differ much in the value of their starting level of GDP per capita. This interpretation does not mean that higher levels of GDP per capita slow down economic growth; it is simply a mathematical relationship. If we had included richer economies in the study, we could have verified that countries having a higher level of initial GDP per capita would grow at slower rates even when the change in their GDP per capita was significantly higher than those of poorer countries.

Likewise, volume of exports, natural resources, life expectancy, investment, and foreign direct investment inflow were positive and significant for the year 2010. A 1 unit increase in the amount of exports

led to 0.02% additional growth in the economy. The p-value of 0.04 revealed a high level of significance. A 1% additional production of natural resources relative to GDP increased growth by about 0.06% at a statistically significant level. An increase in life expectancy was also an important factor of economic growth. A 1-year increase in life expectancy of the people in the country increased growth 0.1%. The p-level of the coefficient was 0.08, which represented a high level of significance. Similar results were shown by the coefficients of the investment rate and foreign direct investment inflow. Their impact on economic growth was equivalent 0.09% and 0.13% per 1% increase in their values respectively. The p-value for investment was very close to zero showing strong statistical significance while p-value for foreign direct investment inflow was about 0.07 which showed high statistical significance.

These results verified that the factors that affect growth of developed countries often hold true for developing countries. However deviation from this conclusion was observed for natural resources production, as it did not show Dutch Disease effects. Natural resources did not have a negative impact, as suggested by the Dutch Disease effect.

Other statistically significant coefficients in this result were the rate of government debt and the foreign aid a country received. They had a negative coefficient implying that these factors had an inverse relationship with the economic growth, which was expected in this study. The coefficients of government debt and foreign aid were -0.04 and -0.09 respectively. These results were also consistent with existing theories that high debt and inflow of foreign aid may help a country develop in the long run but have a detrimental effect in the short term as shown by 2010 data.

The mean of the dependent variable, the growth of GDP per capita, of our sample was 5.25%. This was more than the world average for 2010, and so supports the convergence hypothesis.

The adjusted R-squared for this test was about 0.41, signifying that the model explains about 41% of the causes of economic growth in 2010. The F-statistics and the p-value of F-statistics which were 12.78 and approximately 0; this signified that we were able to find independent variables that had effects on the dependent variable. By looking at these numbers, the robustness of the test can be verified.

TABLE 3–Regression output for the data for year 2010

OLS: Using observations (n= 57). Dependent Variables: GROWTH

Variable	Coefficient	Std. Error	t-ratio	p-value	Sig variable
Constant	−0.93	3.81	-0.24	0.81	
INITIALGDP	0.00	0.00	-6.17	<0.00	***
EXPORT	0.02	0.01	2.09	0.04	**
DEBT	-0.04	0.01	-3.08	0.00	***
RESOURCE	0.06	0.02	2.93	0.01	***
AID	-0.09	0.04	-2.33	0.02	**
LIFE	0.10	0.06	1.77	0.08	*
INVEST	0.10	0.03	2.87	0.01	***
FDI	0.13	0.07	1.83	0.07	*
Mean dependent var	5.25	S.D. dependent var	3.14		
Sum squared resid	279.10	S.E. of regression	2.41		
R-squared	0.49	Adjusted R-squared	0.41		
F(8, 48)	12.78	P-value(F)	0.00		
Log-likelihood	-126.15	Akaike criterion	270.30		
Schwarz criterion	288.69	Hannan-Quinn	277.45		

***, **, and * denotes significance of coefficients at 1%, 5% and 10% respectively.

It was necessary to check the above results for collinearity as the dataset may have high correlations among the independent variables. Correlations among independent variables lead to unreliable and unstable results. To verify that the result above did not have multicollinearity, the variance inflation factor (VIF) test was conducted. This test ran a series of models similar to our Ordinary Least Squares model above using each of the independent variables as the dependent variable. If the score of the VIF test were more than 10, then one independent variable would be collinear to another and if it were less than 10 then there would be no collinearity. The collinearity issue could be solved by dropping one of the collinear variable. The result of variance inflation factor (VIF) test showed that the

above result did not have multicollinearity as all the scores were less than 10. The results from the variance inflation test (VIF) were presented in Table 4 below.

TABLE 4–Variance Inflation Factor (VIF) test result

Minimum possible value =1.0 and values > 10.0 may indicate a collinearity problem

Variables	VIF score
INITIALGDP	1.84
EXPORT	1.04
DEBT	1.15
RESOURCE	1.38
AID	2.47
LIFE	1.30
INVEST	1.47
FDI	2.43

VIF(j) = 1/(1-R(j)^2), where R(j) is the multiple correlation coefficient between variable J and other independent variables.

This study also tested the consistency of the results from one year to another. For this reason, a few more Ordinary Least Squares model were run, one for each of the years 2005, 2000, and 1995. The regression output for the years 2010, 2005, 2000, and 1995 is summarized in Table 5 below. The table shows the coefficient of the variables for each year and their significance level- *, **, *** at 10%, 5%, and 1% respectively. It also provides information on sample size (n), adjusted R- squared, F-test, and p-value of the F-test which helped determine the robustness of the model.

The sample size of the Ordinary Least Squares model for the year 1995 was 16, which is a very small sample. While the study started with more than 70 countries, there were missing observations for specific variables for many countries in the year 1995. The whole observation was eliminated if the value of one variable for that observation was missing. Thus, the missing variables explained why the sample size of each model

was different. Therefore the result for the year 1995 was ignored in the discussion about consistency overall.

The comparison of three Ordinary Least Squares models showed the factors that had a positive effect on economic growth in developing countries. It showed that the volume of exports and production of natural resources were the best sources of economic growth for the developing countries. The coefficients of both the variables were positive and highly significant across all three time periods. It also showed that the increase in life expectancy and the increase in investment had positive impacts on the economic growth for two of the three time periods studied. The coefficients of life expectancy and investment variables were significant at 10% and 1%, respectively. Thus, this showed that openness to trade, production and use of natural resources, better health services leading to longer life, and investment in the economy were positive factors for economic growth in developing countries. Therefore, policies promoting these factors should be encouraged.

On the other hand, we were not able to verify the theory of convergence, effects of debt, and effects of aid. The coefficient for starting level of GDP per capita was almost zero for the years 2005 and 2000. This meant that for all developing countries, the initial size of GDP per capita did not matter. But this variable was not statistically significant for the years 2005 and 2000. In general, we do not have statistical evidence to say that theory of convergence held true. Likewise, the coefficient for government debt and the level of international aid, which were expected to have negative effects on economic growth, were not statistically significant. Therefore, there was not enough evidence to draw the conclusions that high government debt and high foreign aid inflow had a detrimental effect on a developing country's economy.

Finally, it was noted earlier that the coefficient of the foreign direct investment inflow was positive in the year 2010. But the coefficient in the year 2000 was negative. Both coefficients were statistically significant at the10% level. The expected coefficient for foreign direct investment was positive. Thus, this result is different than what the study had expected. This study was unable to verify the hypothesis that foreign direct investment has a positive impact on economic growth. Further studies are required to verify if the foreign direct investment inflow has an impact on the economic growth of developing countries.

Overall, the Ordinary Least Squares models used to compare the results were able to provide insight on the factors of economic growth in

the developing countries. All the models were significant, as shown by the high magnitude of F-statistics with the p-values of F-statistics close to zero. The adjusted R squared of all three different models were consistent and between 0.41 and 0.43. The closeness of the adjusted R squared further strengthens the claim that the models are a good fit.

TABLE 5: OLS results for Years 2010, 2005, 2000 and 1995 summarized

OLS: Using available observations

Dependent Variables: GROWTH

Variable	2010	2005	2000	1995
Constant	-0.93	2.24	-9.14*	41.19**
INITIALGDP	-0.00***	0	0	0.00*
EXPORT	0.02**	0.21***	0.12***	0.46**
DEBT	-0.04***	-0.01	-0.01	-0.21
RESOURCE	0.06***	0.10***	0.09**	-0.15
AID	-0.09**	0.06	0.08	0.1
LIFE	0.10*	0.28	0.15*	0.87**
INVEST	0.10***	-0.02	0.11***	0.26*
FDI	0.13*	0	-0.42**	-0.39*
Sample size (n)	57	59	48	16
Adj. R2	0.41	0.41	0.43	0.68
F- test	12.78	4.13	7.62	16.41
P-value (F-test)	0	0	0	0

***, **, and * denotes significance of coefficients at 1%, 5% and 10% respectively.

This study, however, was missing some key indicators of economic growth. In the empirical papers of growth of developed countries or all countries, factors like education and technological improvements have a positive correlation with economic growth. This study failed to include those variables. This was because of the lack of data on those indicators for developing countries. Many different indicators of education such as literacy rate, primary school enrollment rate, secondary school enrollment

rate, etc. and indicators of technology such as internet access, mobile phone access, patent registration, etc. were considered but data could not be found for most of the countries considered in the sample. Also, previous studies in development economics considered using variables like effectiveness of governance, corruption, rule of law, internal conflict, religion of people, etc. Due to the limited nature of this study and issues of data availability, those variables were not used here. Missing variables in this study might have created omitted variable bias. By carefully identifying important variables and including those variables in the model the results could be improved which could have significant policy implications for developing economies.

V. Conclusion

This study use Ordinary Least Squares regressions for the years 2010, 2005, 2000, and 1995 to investigate the factors that contribute to economic growth. Then it compares them across time to find if the patterns in the variables are consistent. It finds that the volume of exports and the production of natural resources have positive impacts on economic growth in developing countries during all time periods measured. It also finds that higher life expectancy and increases in investment have a positive impact on economic growth, but this result was only valid for two out of three time periods. These findings are consistent with previous research and some of these factors have the same effect on economic growth of both developed and developing countries. Furthermore. No evidence of Dutch Disease Effect was found.

However, this study does not give clear indication on the effects of some variables on economic growth of developing countries. First, it finds contradictory result on the effects of foreign direct investment on economic growth. It finds that inflow of foreign investment had positive effects on economic growth in one time period, whereas it has a negative effect in another for developing countries. This calls for additional research in the role of foreign direct investment in developing countries.

Second, it does not provide enough evidence on the conditional convergence theory that big economies grow slower. One explanation of that outcome is that most of the developing economies have the same level of initial GDP per capita level. Additional research may be able to determine if developing economies who all start at the same levels of per capita GDP show convergence in the long run.

In addition, the models do not find consistent results for the effects of government debt and foreign aid inflow on economic growth. The first model showed a negative effect of high level of government debt and high levels foreign aid. But additional models do not complement the findings, thus leaving a gap in the study to be filled by future studies.

While this study has political implications on how to effectively raise the economic conditions of developing countries, more research needs to be done. Better data would help. Specific case studies on developing countries that are growing at a faster rate may also help answer some of the growth-related questions. Future researchers should run time series or panel analysis using a similar dataset to verify the results from this study. The policy suggestions generated by such research could have a significant impact on the growth rates of developing countries.

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