



CENTRALE BANK VAN SURINAME

Testing the Export-Led Growth Hypothesis: The Case of Suriname

Janice Narain

jnarain@cbvs.sr

Gavin Ooft

gooft@cbvs.sr

Nancy Sonneveld-Fraser

nsonneveld@cbvs.sr

October 2017

The authors are staff members of the Research Department of the Central Bank of Suriname. The views expressed in this paper are those of the authors and do not necessarily reflect those of the Bank. Research papers constitute work in progress and are published to elicit comments and to further debate.

Abstract

The export-led growth hypothesis posits that exports are the main driver of economic growth. In recent decades, exports of especially mining products have contributed notably to growth of the Surinamese economy. This paper seeks to determine the extent to which the export-led growth hypothesis applies to Suriname. A Dynamic OLS is employed with data over the time period 1971 to 2015 to estimate the impact of exports of goods on economic growth over the long run. The results reveal that exports are a crucial determinant for macroeconomic growth. This paper contributes to our understanding of the economic process in Suriname and adds value to the literature because as far as is ascertained no research has been published on this subject for Suriname.

Contents

Abstract

| | |
|--|----|
| 1. Introduction | 4 |
| 2. Trade Developments and Growth in Suriname | 5 |
| 3. Literature review | 9 |
| 4. Model Specification | 14 |
| 5. Methodology, Data and Results..... | 16 |
| 6. Conclusions and Policy Recommendations | 20 |

References

Appendices

Appendix 1: Description of Variables

Appendix 2: Descriptive Statistics

Appendix 3: Unit-Root Test Results

Appendix 4: VAR Lag Length Results

1. Introduction

In the last decade, a period of sustained growth was achieved, mainly driven by the production of mining resources. Exports of Suriname were soaring since 2004 due to the expansion of the gold sector but also due to favorable prices for gold, oil and alumina. Mining exports contributed to around 79% of total exports in 2015, while the contribution of this sector to GDP was around 24% (Central Bank of Suriname, 2015). Prior to the sharp decline in international oil and gold prices at the end of 2013, the contribution of mining exports to total exports and GDP was even larger.

This paper seeks to investigate to what extent the export-led growth hypothesis applies to the economy of Suriname. The export-led-growth hypothesis (ELGH) states that exports are a key factor in boosting long-run economic growth. This means that besides the classical inputs, namely labor and capital, export expansions also stimulate economic growth. Exports can thus function as an “engine of growth”. Despite the underlying theory of the ELGH, no universal empirical evidence has been found that export growth leads to economic growth. Although empirical evidence on the export-led growth are inconclusive, numerous studies found a significant and positive impact of exports on economic growth for countries considered in the various investigations.

The volatility of economic growth in Suriname, the importance of especially mining exports and the inconclusive support for the ELGH motivated us to determine to what extent this hypothesis applies to Suriname. This paper investigates the relationship between exports and economic growth in Suriname during the period 1971 to 2015. The findings of the study will provide policy makers with better insights whether the emphasis of economic policy should be placed on exports. The research adds value to the literature since, as far as is assured, such a research has not been done for Suriname.

The remainder of the paper is structured as follows. Section 2 overviews the development of trade and economic growth in Suriname over the research period, while section 3 reviews relevant theoretical and empirical literature. Section 4 describes the variables used for the empirical research. Section 5 elaborates on the data-analysis and the results. Lastly, section 6 concludes and presents policy recommendations.

2. Trade Developments and Growth in Suriname

International merchandise trade in Suriname reveals distinct experienced different developments during the period 1971 to 2015. The trade balance predominately noted surpluses over this period, due to the favorable developments in the mining and the agricultural sector. In addition, favorable international prices of the main export commodities, namely gold, crude oil, alumina, rice and banana contributed to the positive trade balance. These developments were often supported by favorable fiscal and monetary policies. Important to mention is that in addition to the trade balance surpluses the current account balance largely displayed deficits due to sustained deficits on the balance on services. However, the risk still remains that economic outturns such as positive trade balances and economic growth, especially driven by the mining sector as over the past few years, are fairly vulnerable to international price shocks (World Trade Organization Secretariat, 2013).

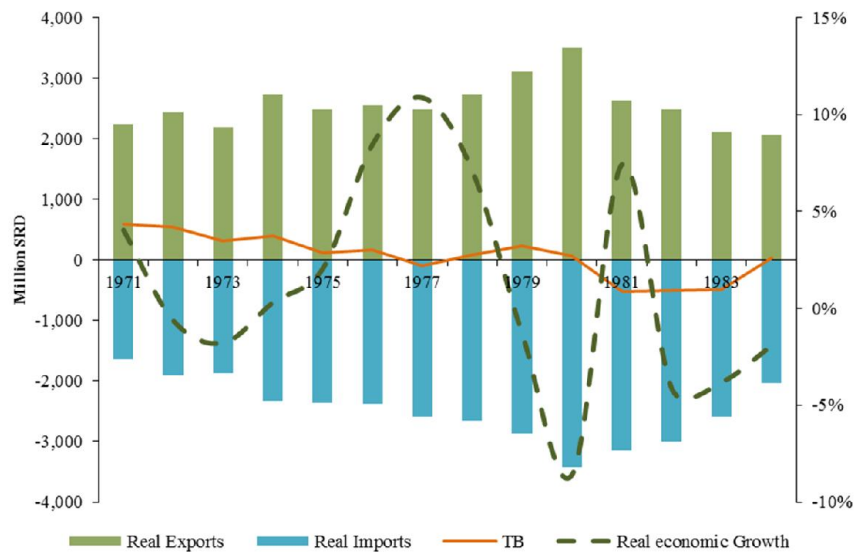
2.1 Trade developments: 1971-2015

Suriname experienced several years of flourishing economic growth and surpluses on the trade balance due to favorable conditions for the main export commodities. Based on the trade balance development and growth performance, three periods can be distinguished, namely 1971-1984, 1985-2000 and 2001-2015. The period 1971 -1984 reveals stable exports and relative economic growth while the second period is characterized by macro imbalances, political instability, poor economic growth and adjustments. Following the developments in the second period the third period is recognized by macroeconomic balance, rapid exports growth along with stable and sustained economic growth.

1971 - 1984

During the period 1971-1984, the economy experienced relative low annual economic growth of 1.3% on average, partly as a result of political instability and macroeconomic imbalances along with the side effects of low international prices for locally produced commodities. Bauxite, alumina and aluminum were the main mining export products and important sources of government income. The trade balance registered surpluses due to favorable export prices except from 1981 to 1983. In 1977 the trade balance deteriorated significantly as a result of expansionary fiscal policy which induced strong increases in imports (Central Bank of Suriname, 1977).

Figure 1: Trade balance and Economic growth 1971-1984



Source: Central Bank of Suriname, 2015

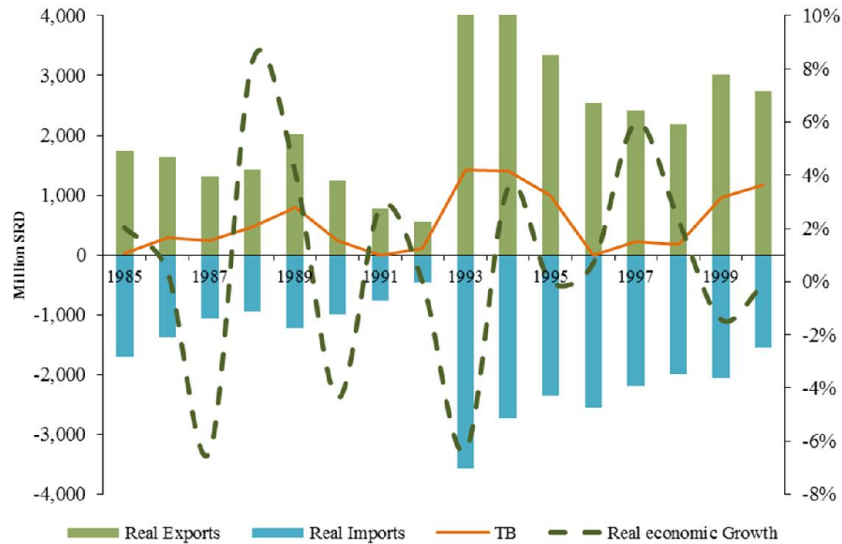
The trade balance recorded sharp deficits for three consecutive years starting in 1981 and the economy experienced annual negative growth of 0.2% on average. These sharp trade deficits were almost entirely attributable to declining exports from the bauxite sector caused by low international prices. The world recession in 1981 reduced the demand for raw materials and intermediate goods causing an oversupply in the world market. Consequently, international prices for Suriname’s primary export commodities, alumina and aluminum, declined sharply. The bauxite industry suffered from these lower prices and forced production reductions. Under these circumstances imports continued to increase. In order to prevent depletion of foreign exchange reserves, the government was forced to take restrictive measures against rising imports in 1983 (Central Bank of Suriname, 1983). Some of these measures included adjustments of government expenditures.

1985-2000

The trade balance showed a positive turnaround after 1983, which was attributable to declining hydrocarbon imports, emanating from lower international oil prices as a result of overproduction in the world market, and to higher exports of agricultural and wood products while the economy experienced poor economic growth. Moreover, imports of fuel oil declined partly due to the decrease in local bauxite production, and partly due to local supply of fuel oil by Staatsolie Maatschappij N.V. to the bauxite companies. However, the period of export growth was disturbed in 1990 by rising inflation, which coincided with an overvalued exchange

rate¹ on the parallel market. Operational costs were financed based on higher rates. For these reasons, domestic production and economic growth were hampered, while exports were undermined. At the end of 1990, the economy of Suriname shrank by 4.4% (Central Bank of Suriname, 1990).

Figure 2: Trade balance and Economic growth 1985-2000



Source: Central Bank of Suriname, 2015

The inflationary effects that arose due to the increased price for the U.S. dollar on the parallel market in 1990 were still noticeable in 1991 and resulted in a trade deficit. To stabilize the economy, a Structural Adjustment Program (SAP) was introduced (1991) as well as a multiple exchange rate system (1992). The latter impacted the economy adversely and led to sharp depreciation of the U.S. dollar price on the parallel market, resulting in inflation acceleration. To improve and strengthen the competitiveness of the export sector, the monetary authorities unified the exchange rate in July 1994. The effects of the unification resulted in recovery of tradable and the non-tradable sectors. Consequently, the economy registered growth of 3.5% at the end of 1994. However, this recovery was short-lived as in 1996 a new government changed course by discontinuing with the SAP leading to an increase of goods imports by 34.3% (Dijk van, Dijkstra, Jong de, Martin, & Vos , 2000). After 1996, exports recovered but experienced setbacks again in 1998. The fall in world prices for alumina and expansionary fiscal and monetary policies caused major economic disruptions. As a result, exports declined

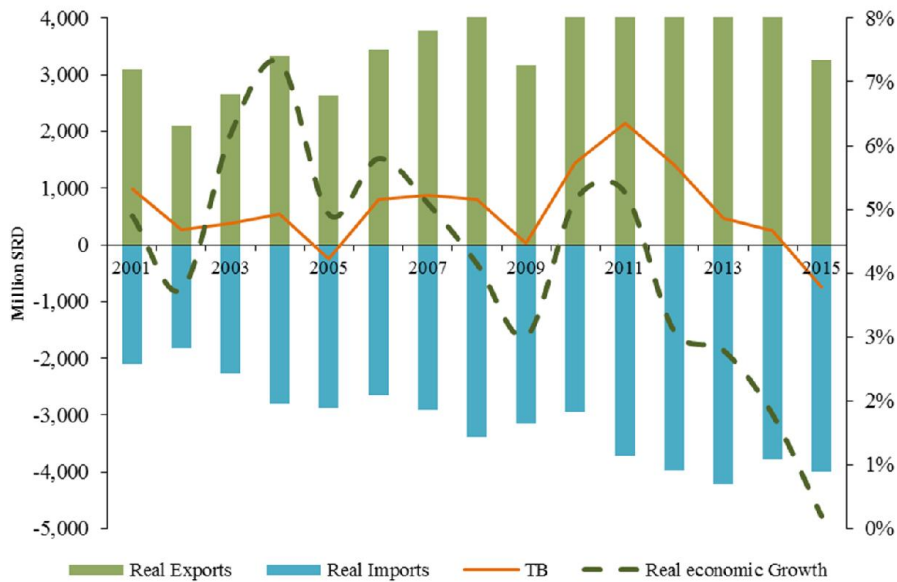
¹ The increased price for the U.S. dollar on the parallel market mainly occurred as a result of declining foreign exchange inflow, depletion of the international reserves, fiscal dominance and overvaluation of the local currency caused by uncertainty among the local people.

while imports remained more or less constant. Important to mention is further deterioration of the current account deficit in 1998 that was financed through external borrowing and drawing on international reserves. The latter resulted in a macroeconomic imbalances along with adjustments causing shrinkage of the economy by 0.4% at the end of 2000.

2001 - 2015

Overall, the period 2001 - 2015 showed an upturn in economic activity. After a period of annual average economic growth of 1.0% (1971-2000), the economy recovered and registered an average growth of 4.2% during 2001 and 2015. The trade balance was mainly in surplus for the period under discussion, except for the years 2005 and 2015. Suriname owes these results to the upswing in the mining sector, favorable commodity prices and conditions in the agricultural sector. Investments in the infrastructure and construction sector were mainly supported by stimulating fiscal and monetary policies that also contributed to the positive outcome. As a result the economy of Suriname experienced stability and robust growth.

Figure 3: Trade balance and Economic growth 2001-2015



Source: Central Bank of Suriname, 2015

This turnaround was the result of investments in the mining, infrastructure and construction sector supported by prudent fiscal and monetary policies, such as contributing to a favorable investment climate. The production and exports of rice and banana went through a revival after 2002. Even though small-scale gold mining already contributed significantly to the economy since the 80's, the large-scale mining by Rosebel Gold Mines NV which started in 2004, substantiated the significance of this sector even more (Fritz-Krockow, et al., 2009). Increased

gold output and exports resulted in a growth of 7.4% at the end of 2004. The trade balance sustained modest surpluses until 2009, when the effects of the global recession pushed the trade balance into a small deficit due to declining prices of alumina (35%) and oil (27%). However, economic growth remained fairly stable in 2009. In addition, the export volume of alumina fell due to reduced demand and the departure of the multinational BHP Billiton from Suriname. On the other hand, global uncertainty about the degree of economic recovery pushed the export price of gold up and limited the decrease of its total export value. The international gold price rose by almost 64% over the next three years. Consequently, exports increased sharply resulting in the largest trade surpluses in history and modest growth. On the contrary, the international gold price started to show a downward trend at the end of 2013 causing the export revenues to decline in the following two years but also phase out by Suralco² contributed to this result. In addition the imports of goods started to rise in 2015 which can be partly attributed to the construction of the new goldmine, Surgold, but also to the expansive consumption behavior of the Government resulting in a trade deficit and poor economic growth of 0.2% in 2015. Also mentionable is the increasing gap between the official exchange rate and the parallel rate in 2015 that could not be controlled and led to a devaluation of approximately 21%. A deterioration of public finances was the main reason for this rate adjustment.

3. Literature review

Theoretical review

The relationship between export and economic growth has been subject of research for many decades and is still a subject of debate since many changes took place in the field of development economics and international trade policy. The strong link between exports and growth led many people to believe that export expansion is a key factor in economic growth. Accordingly, the export-led-growth hypothesis (ELGH), which implies that export expansion is one of the main determinants of economic growth, is a highly debated issue among many researchers and policy makers.

² In September 2015, Alcoa announced the closure of the Suralco Plant and in November 2015 the company discontinued production activities. The main reason that led to this decision is inadequate supply of bauxite that resulted in losses for the company. The discontinuation of Suralco's production activities led to a decrease in the export volume of alumina.

Theoretical debates on the ELGH find their origin in classical economic theories. Classical economics argues that economic growth can be achieved through international trade. Specialization and reallocation of resources will increase the productivity of the export sector. Additionally, exports based on comparative advantages can lead to exploitation of economies of scale. An increase in exports could provide the economy with more foreign exchange, which is used for imports of inputs for domestic production. This leads to output expansion, and ultimately in economic growth (Chenery & Strout, 1966). For example, industrial development in the Caribbean as proposed by Sir Arthur Lewis in the 1950s, was based on the export led growth strategy. This strategy include two variants, the ‘export led natural resource base strategy’ and the ‘export led industrialization by invitation strategy’. Lewis advocates that these small open developing economies need to produce the type of manufactures in which the economy has an abundance of natural resources. In order to support themselves, the manufactures should be sold to developed economies and intra-regional markets, which will enhance the prospects of economic growth.

Though there has been an ongoing controversy about the effects of trade on economic growth, many economies shifted from inward-oriented policies to export-promoting strategies. During the 1970s and 1980s the export-led growth (ELG) strategy has received renewed attention, as exports were deemed the main engine of growth in South-East Asia, especially when compared to the failure of the import substitution policies adopted by African and Latin American countries (Abou-Stait, 2005). The advocates of the ELGH argue that, for instance, the Four Asian Tigers³, Malaysia and Thailand have been successful in achieving high and persistent rates of economic growth since the 1960s due to their outward-oriented economies (World Bank, 1993). Balassa (1998) argued that developing countries, mostly in Latin American, following the inward-oriented policies had poor economic achievements. On the other hand, Jaffee (1985) raise doubts about whether the export-led growth strategy will sustain long-run economic growth in less developed because of the volatility and unpredictability of international markets.

The ELGH can be justified with several theoretical arguments. First, it can be argued from a demand-side perspective, that sustained demand growth cannot be maintained in small domestic markets, since any economic impulse based on the expansion of domestic demand is bound to be exhausted quickly. Export markets, in contrast, are almost limitless and hence do

³ Taiwan, Hong Kong, Singapore and South Korea.

not involve growth restrictions on the demand side. Thus, exports can be a catalyst for income growth, as a component of aggregate demand (Agosin, 1999). Secondly, an increase in exports may lead to an inflow of foreign exchange, needed for import inputs for domestic production and export expansion (Chenery & Strout, 1966). An increase in the import of capital goods from technology-advanced economies might stimulate technical diffusion in the economy and increase the capital formation, which can ultimately lead to higher productivity and output growth (Chuang, 1998).

The support for the EGLH, however, is not universal. According to Palley (2002), exports prevent growth and development of domestic markets. It is blamed for inducing financial instability by creating over-investment booms. Furthermore, ELGH enhanced the dependency of the Developing countries (DCs) on the developed economies, as the DCs are dependent on foreign demand. Critics of this hypothesis postulate that the East and South-East Asian countries are unique in many ways and not comparable to other countries. An export boom could lead to an engine of economic growth depending on the economic structure of the economy (Buffie, 1992).

Neoclassical theory supports the ELGH, as it proposes that other factors besides export have an impact on economic growth. In addition, a feedback causal relationship between exports and growth is important. For example, Helpman and Krugman (1985) postulate that exports might increase from the realization of the economies of scale due to productivity gains. As a result, export increases lead to cost reduction and eventually in higher productivity gains.

Empirical review

There is extensive empirical literature on the ELGH, yet the results are inconclusive. While the evidence of a correlation between exports and economic growth tends to hold only in most cross-sectional studies, more than half of the recent country-specific studies, few industrialized countries and developing countries found a significant correlation between these variables in the long run.

Emery (1967), Syron & Walsh (1968), Serven (1968), Kravis (1970), Heller and Porter (1978), Feder (1983) studied the export led growth hypothesis using a large sample of countries for the period 1953-1978. They employed bivariate correlation and the Spearman rank correlation test

in a cross-country format. These studies in general show that high levels of export growth are associated with high levels of economic growth (Lussier, 1993).

Amongst others Bassala (1978) (1985), Tyler (1981), Kavoussi (1984) and Moschos (1989) investigated the validity of the export led growth hypothesis within the neoclassical framework, primarily for DCs, in the period 1960-1980. The majority of these studies utilized cross-sectional data in a classical production function framework. Employing ordinary least squares techniques (OLS) and the Spearman rank correlation test, the results of these studies also supported the ELGH. These studies were criticized on the basis that country specific factors were not included. Moreover, these studies implicitly assume a common economic structure and identical production methods and may lead to spurious results (Shan & Sun, 1998).

Some studies tested the direction of causality between export and growth employing the Granger causality method. Jung and Marshall (1985), for instance, employed OLS and Granger causality test using time series to examine the relationship between exports and growth for 37 developing countries in the period 1950-1981. This study revealed that for only four countries (Indonesia, Egypt, Costa Rica and Ecuador) the results have supported the ELGH. In a study of four Asian countries over the period 1955-1982, Darrat (1987), rejects the relationship between export and growth in 3 out of 4 cases. Chow (1987) analyzed the reciprocal causality hypothesis regarding manufacturing output growth and export growth of manufactured goods in eight newly industrialized countries⁴ (NICs) utilizing a causality test. The research supported a strong bi-directional causality in most of the NICs in the period 1960-1980. In contrast to the results of Chow, in their study Jung and Marshall found no evidence of bi-directional causality for four out of six countries common in the two samples (Brazil, Korea, Mexico and Taiwan). The difference in results can be partly explained by the fact that Chow uses manufacturing output growth as a measure of aggregated output while Jung and Marshall employ gross domestic product.

Van den Berg & Schmidt (1994) found a positive long-run relationship between exports and growth in 11 of 16 Latin-American countries analyzed in the period 1960-1987. This study uses real GDP growth, real export growth, gross domestic investment and population growth to measure the relationship between exports and growth. Bahamani-Oskooee and Alse (1993)

⁴ South Korea, Hong Kong, Singapore, Taiwan, Mexico, Brazil.

re-examined the direction of causation between exports and economic growth for nine developing countries employing an Error-correction modeling (ECM) technique. The results yielded strong evidence to support the ELGH for all countries in the sample. Likewise, the study of Xu (1996) showed evidence of support in 17 of the 32 developing countries. Using a large sampling of 97 countries, Anwar and Sampath (2000) examined the ELGH and their results revealed evidence of a positive impact of exports on economic growth.

Kemal et al (2002) examined the validity of the ELGH for five south Asian countries. This research provided strong support for causality from export to GDP for India and Pakistan in the long run, while for Bangladesh, Nepal and Sri Lanka bidirectional causality was found. In the short run, causality from exports to GDP was found for Bangladesh and Sri Lanka, while causality from GDP to exports was found for India and Nepal.

Herzer (2006) for instance, examined the export led growth hypothesis in Chile using annual time-series data for 1960-2001. This study investigated if and how manufactured and primary exports affected economic growth via increases in productivity whereby several single-equation and system co-integration techniques were applied. The primary conclusion emerging from this study is that the exports of manufactured products have been important for productivity and thus for economic growth.

Wong Hock Tsen (2010) examined Granger causality between exports, domestic demand and economic growth in China using time series over the period 1978-2002. Household consumption, government consumption as well as investments were used to measure domestic demand. This study showed a dynamic relationship between these variables. Exports and domestic demand are both important for China's economic growth. Growth, on the other hand, has an impact on China's exports and domestic demand.

Brown (2015) tested the validity of the ELGH for Jamaica and selected Latin American and Caribbean countries (Barbados, Costa Rica, Dominica Republic, Guyana, Jamaica, Trinidad & Tobago). In her model the author used quarterly and annual time series data for Jamaica for the period March 1997 – December 2014 and compared the results with other regional countries using annual data. In order to investigate the existence of a long run and short run relationship between exports and real GDP, the Autoregressive Distributive Lag (ARDL) bound testing approach was employed. The results of this study based on quarterly data provide evidence of ELG in Jamaica, as the impact from exports was statistically significant in the long run. In the

context of the regional countries investigated, evidence of a cointegration relationship between GDP and trade factors was found only for Barbados, Guyana and Jamaica. In the short run no significant impact of exports and imports was found on GDP growth, however, in the context of the Jamaican economy, results revealed evidence of statistically significant trade factors.

In their research, Bakara and Saaidia (2016) study the relationship between exports, imports, and economic growth in China. Using time series for the period 1960-2015, the Augmented Dickey-Fuller (ADF) test and cointegration analysis using a Vector Error Correction Model (VECM) was utilized. The results suggested a positive effect of exports on the economic growth. In the long-run an increase in exports leads to an increase in GDP. The analysis also demonstrates that imports have a negative effect on growth. The conclusion emerging from this study is that exports have been and probably will continue to be the source of economic growth of China.

Shafiullah and Navaratnam (2016) tested the ELGH using Bangladesh and Sri Lanka as a case study. The hypothesis was examined by using the Auto Regressive Distributed Lag (ARDL) bound test for cointegration and a Granger causality test. The models control for domestic and international factors. The results pointed on cointegration between exports and growth and the Granger causality test proofed that long-run causality runs from exports to GDP in both countries.

4. Model Specification

Economic literature posits numerous indicators as drivers of economic growth. In this study we utilize a model which includes variables which we expect to apply most to small open commodity exporting economies with similar characteristics as Suriname. Our main variables of interest are economic growth and the exports of goods. The variables were selected based on literature and the characteristics of the Surinamese economy. The model was also made parsimonious by leaving out other possible determinants which did not seem to improve the model selection criterion. The empirical model is constructed as follows:

$$GDPC_t = f(EXP_t, CRD_t, CUREX_t, GINV_t)$$

Where $GDPC_t$ denotes the real GDP per capita and EXP_t , CRD_t , $CUREX_t$, $GINV_t$ are respectively the total exports of goods, total credit to the private sector, current government expenditures and government investment. The sample period in this analysis is limited to 1971

to 2015 and the data is on an annual basis. Data for GDP is gathered from the General Bureau of Statistics, while data for the remaining variables is obtained from the Statistical Division of the Central Bank of Suriname.

The export-led growth hypothesis (ELGH) states that export growth is a key factor in promoting long-run economic growth. This implies that overall growth is not only generated by increasing labor and capital within the economy but also through export expansion, thus exports are deemed as an “engine of growth”. Despite the underlying theory of the ELGH, no uniform evidence has been found that export growth leads to economic growth. Smith (2001) has found evidence supporting the hypothesis. First, he argues that an expansion in exports may promote specialization in sectors in which a country has comparative advantage, and lead to a reallocation of resources from the relatively inefficient non-trade sector to the more productive export sector. Second, the growth of exports can increase productivity by offering larger economies of scale. Third, export growth may affect total factor productivity through dynamic spillover effects on the rest of the economy. We expect that the ELGH holds for the economy of Suriname.

Hansen and Sull (2013) argue that financial deepening can help boost income per capita in a country or region. Their argument is based on the assumption that better access to credit has the potential to stimulate supply-side driven economic growth by promoting capital accumulation and total factor productivity. However, some studies have rejected the statement by finding evidence saying that the positive relationship between credit growth and economic growth tends to disappear when financial depth becomes too high, when institutions quality is poor or when inflation is excessive. The latter defines the relationship between credit growth and economic growth as to be ambiguous.

There are different views with regard to the relationship of government expenditures on economic growth. The results of various empirical studies are ambiguous. Mungroo, Ooft and Tjon Kie Sim - Balker (2014) examined the relationship between these two variables for Suriname during the period 1971-2011 by using a Dynamic Ordinary Least Square method. According to the Keynesians it is the government’s responsibility to influence economic growth while the Classical view argues that there exists an inverse relationship between the two variables and therefore the government should have an indirect role in promoting growth. For this study the authors emphasize the importance of decomposing government expenditures to examine the impact on its constituent part on growth. Government expenditures are

disaggregated in capital expenditures, wages and salaries paid to civil servants, goods and services and subsidies and transfers. Interest payments are excluded from the analysis as theory makes no relation between this expenditure item and growth. The results indicate that capital expenditures have a significant positive but marginal impact on growth in the long-run while all the other components tend to shrink economic growth.

Andrew (2014) conducted a study on public investment and growth. He empirically tried to examine whether large investments in infrastructure have succeeded in promoting economic growth in low-income countries. On average, the evidence shows a weak positive association between investment spending and growth but only in the same year as the investment is done, as lagged impacts are not significant. Furthermore, there is little evidence of long-term positive impacts. Various case studies in this research indicate that public investments eventually tend to be financed by borrowing and have been plagued by poor analytics at the time investment projects were chosen, incentive problems and interest-group-infested investment choices. These observations suggest that the current public investment drives will be more likely to succeed if governments do not behave as in the past, and instead take analytical issues seriously and safeguard their decision process against interests that distort public investment decisions.

5. Methodology, Data and Results

The study employs annual data from 1971 to 2015 from the Statistical Tables of the Central Bank of Suriname. An essential step within econometrical analysis is investigating the order of integration of utilized variables. We investigate the order of integration of the time series by the means of the Augmented Dickey-Fuller unit-root test (1979) and the Phillips-Perron unit-root test (1988). The unit-root test results (Appendix 3) indicate that all utilized variables are integrated of the order one. Since the data are non-stationary, OLS with data in levels (i.e. natural logs) will yield spurious results. Furthermore, since the variables are $I(1)$, the variables might be cointegrated. Since the variables are integrated of the same order, we estimate a long-run and short-run relationship. The variables are transformed into natural logarithms in order to follow a normal distribution. Log-transformation also enables us to interpret the estimated coefficient as elasticities.

This study utilizes a Dynamic Ordinary Least Squares (DOLS) model developed by Stock and Watson (1993). DOLS models are considered more effective as a traditional Engle-Granger

model and are suitable to handle small data samples as well as stationary and non-stationary variables. The DOLS estimates a long-run and a short-run model, whereby leads and lags are added to the long-run model. The leads correct for endogeneity while the lags cope with ϕ serial correlation. In this model, the long run is estimated using two leads and two lags to avoid serial correlation. The short-run model is estimated with two lags. We use a general-to-specific reduction approach to reach a parsimonious model with only statistically significant variables. The error correction term added to the short-run model is negative and significant, confirming at least one cointegrating relationship between the time series. Both in the long run and in the short run, the residuals pass the diagnostics tests for normality, serial correlation and heteroscedasticity. The long-run DOLS model is of the form:

$$GDPC_t = \beta_0 + \vec{\beta}X + \sum_{j=q}^p \vec{d}_j \Delta X_{t-j} + e_t$$

where GDPC is the dependent variable (i.e. GDP per capita) and X is the matrix of independent variables. Furthermore, $\vec{\beta}$ represents the cointegrating vector, while p is the lag length and q is the lead length. The short-run model regresses changes in GDP per capita on changes and lagged changes of GDP per capita and the independent variables, which were used in the long-run model.

| Table 1: Long-run Results (Dependent variable: GDPC) | |
|---|-------------------------|
| Regressor | Long-run Results |
| EXP | 0.319 (0.043)*** |
| CR | 0.423 (0.071)*** |
| CUREX | -0.287 (0.181) |
| GINV | 0.019 (0.020) |
| C | 6.085 (0.806)*** |
| Summary Statistics | |
| Adjusted R ² | 0.896 |
| S.E. of Regression | 0.039 |
| Durbin-Watson Statistic | 1.832 |
| Observations (n) | 40 After Adjustments |
| Heteroskedasticity-robust standard errors are given in parentheses under coefficients. The individual coefficient is statistically significant at the *10%, **5% or ***1% level of significance using a two-sided test. | |

The results of the long-run estimations are presented in Table 1. Since all variables are transformed into natural logarithms, the coefficients should be interpreted as elasticities. The results indicate that exports and credit to the private sector substantially boost per capita GDP. Exports of mining products, among others, are beneficial to the Surinamese economy in the sense that they supply the economy with foreign currency, which is necessary for imports of inputs for other sectors (i.e. production goods). The effect of exports is statistically significant and has an elasticity of about 0.32. The positive and statistically significant impact of credit makes sense, as credit increases investments, production and hence exports which, in turn, boost economic growth. The additional current government expenditures and government investments variables are statistically insignificant. The long-run model is specified correctly (i.e. BLUE), as the residuals pass the relevant residual tests for heteroskedasticity, normality and serial correlation.

| Table 2: Short-run Results (Dependent variable: ΔGDPC) | |
|---|--------------------------|
| Regressor | Short-run Results |
| Δ EXP | 0.064 (0.021)*** |
| Δ CRD | 0.142 (0.035)*** |
| ECM(-1) | -0.284 (0.102)*** |
| Summary Statistics | |
| Adjusted R ² | 0.224 |
| S.E. of Regression | 0.038 |
| Durbin-Watson Statistic | 1.587 |
| Observations (n) | 43 After Adjustments |
| Heteroskedasticity-robust standard errors are given in parentheses under coefficients. The individual coefficient is statistically significant at the *10%, **5% or ***1% level of significance using a two-sided test. | |

The residuals of the long-run model are stationary, confirming there is at least one cointegrating relationship amongst the variables. Consequently, the short-run model is estimated. Table 2 presents the parsimonious short-run model, which also includes the lagged errors of the long-run model, i.e. the error-correction term. After reducing the short-run model, only credit to the private sector and exports of goods are significant in explaining per capita GDP growth. The positive impact of credit makes sense, as credit increases investments, production and hence exports which, in turn, boost economic growth. The coefficient on the error-correction term is

significant and has the correct (negative) sign. The ECM(-1) coefficient of -0.284 implies that every period, GDP per capita restores by 28.4% towards long-run equilibrium. Therefore, as a result of a random shock, it takes less than 4 years to converge back to long-run equilibrium. The residuals of the short-run model also pass the tests for heteroskedasticity, serial correlation and normality.

Granger Causality Testing

The purpose of this paper is investigating the relationship between GDP and exports. It is therefore also of interest to identify possible Granger causality between these variables. In order to do so, we employ the Toda-Yamamoto (T-Y) procedure for Granger Causality testing, developed by Toda and Yamamoto (1995). This method has the advantage above the general Granger Causality test to deal with non-stationary data. This procedure consists of three main stages. First, the order of integration of respective time series should be determined. As mentioned earlier, we found that the series are integrated of the order one. In the second phase, we estimate a bivariate VAR model and determine the optimal lag length. The lag-length test results (Appendix 5) uniformly indicate we should estimate the VAR with one lag. Therefore the estimated VAR with 1 lag is:

$$GDPC_t = a_0 + a_1GDPC_{t-1} + a_2EXP_{t-1} + \mu_{1t}$$

$$EXP_t = b_0 + b_1GDPC_{t-1} + b_2EXP_{t-1} + \mu_{2t}$$

| Table 3: (Modified) Wald Tests Results | | | |
|--|-------------------|-----------|--------------------|
| Null Hypothesis | Chi-square | DF | Probability |
| H ₀ : EXP does not Granger cause GDPC | 1.249 | 1 | 0.263 |
| H ₀ : GDPC does not Granger cause EXP | 0.884 | 1 | 0.341 |

In the third stage of the T-Y procedure, we utilize the Wald tests to verify the direction and causality between per capita GDP and exports. The results of the Granger-causality tests (Table 3) reveal that there is no significant Granger-causality between GDP per capita and Export. However, evidence for Granger causality from Exports to GDPC is stronger, based on the higher Chi-square value. Hence, since the causality is not significant, there are possibly other

factors preceding these two indicators or intermediary variables (e.g. financial) channels through which exports impact on per capita GDP.

6. Conclusions and Policy Recommendations

This paper examines whether the export-led growth hypothesis holds for the Surinamese economy, utilizing annual data from 1971 to 2015. We utilized a Dynamic OLS model and Granger Causality test to investigate this relationship. The findings of the regression model suggest that exports boost economic growth in both the long run and the short run. However, there is no evidence for Granger Causality between exports and per capita GDP. Hence, there are possibly intermediary variables (e.g. financial) channels through which exports impact on per capita GDP.

As exports boost long-run economic growth, it is mandatory for Suriname to boost its exports and to maintain and acquire more export markets. Policy-makers should focus on boosting export-oriented sectors hence increasing export earnings, which in turn, should be invested in other sectors. Additional efforts should include the strengthening of the labor force by investing in human capital which can stimulate specialization and production efficiency. Investing in technology is also mandatory to increase the productivity of the export-oriented sectors.

References

- Abou-Stait, F. (2005). *Are Exports the Engine of Growth? An application of cointegration and causality analysis for Egypt, 1977-2003*. Economic Research Working Paper Series. Tunis: African Development Bank.
- Agosin, M. R. (1999). Trade and Growth in Chile. *Cepal Review 2006 no. 68*, 79-100.
- Anwar, M. S. & Sampath. (2000). Exports and Economic Growth of Malaysia. *Indian Journal Article, 47 (3)*, 79-88.
- Bahmani-Oskooee, M. and Alse, J. . (1993). Export growth and economic: an application of cointegration modeling . *The Journal of Developing Areas 27* , 535-42.
- Balassa, B. (1998). *The process of industrial development and alternative development strategies*. Princeton, NJ: Princeton University, Department of Economics): Princeton Essays in International Finance No 141, December.
- Bassal, B. (1985). Exports, policy choices, and economic growth in developing countries after the 1973 oil shock. *Journal of Development Economics, 4, 1*, (June): 23-35.

- Bassala, B. (1978). Exports and economic growth: Further evidence. *Journal of Development Economics*, 5, 2, (June):181-89.
- Brown, D. (2015). *Testing the Export-Led Growth Hypothesis: An Application of the ARDL Bound Test Approach -Evidence from Jamaica and Selected Latin American and Caribbean Countries*. Bank of Jamaica, Research and Economic Programming Division. Bank of Jamaica.
- Buffie, E. F. (1992). On the Condition of Export Led Growth. *Canadian Journal of Economics* 25, 211-25.
- Central Bank of Suriname. (1977). *Annual Report*. Paramaribo: Central Bank of Suriname.
- Central Bank of Suriname. (1983). *Annual Report*. Paramaribo: Central Bank of Suriname.
- Central Bank of Suriname. (1990). *Annual Report*. Paramaribo: Central Bank of Suriname.
- Chenery , H. B., & Strout, A. (1966). *Foreign Assistance and Economic Development*. American Economic Review 56: (679-732).
- Chow, P. C. (1987). Causality between export growth and industrial development: Emperical evidence from the NICs. *Journal of Development Economics*, 26, 1, (June): 55-63.
- Chuang, Y.-C. (1998). Learning by Doing, the Technology Gap, and Growth. *International Economic Review* 39, no 3 , 697-721.
- Darrat, F. A. (1987). Are Exports an Engine of Growth? Another Look at the evidence. *Applied Economics*, 19, 2, (February): 277-83.
- Dickey, D., & Fuller, W. (1979). Distribution of the Estimators for Autoregressive Time Series with a Unit Root. *Journal of the American Statistical Association* 74, 427-431.
- Dijck van, P., Dijkstra, G., Jong de, N., Martin, D., & Vos , R. (2000). *The Suriname Economy: Experiences of the 1990's and Challenges Ahead*. Amsterdam.
- Emery , R. F. (1967). The Relation of Exports and Economic Growth. *Kyklos*, 470-86.
- Feder, G. (1983). On exports and economic growth. *Journal of Development Economics*, 12, 2, (February/April): 59-73.
- Fritz-Krockow, B., El-Masry, G., Nozaki, M., Roy, T., Portillo, R., Torres, M., & Dyczewski, P. (2009). *Suriname Toward Stability and Growth*. Washington, D.C.: International Monetary Fund.
- Heller, P. S. and Porter, R. C. (1978). Exports and Growth: An emperical re-investigation. *Journal of Development Economics*, 5, 2 , (June): 191-93.
- Herzer, D. (2006). Export-Led Growth in Chile: Assessing the Role of Export Compositionin Productivity Growth. *The Developing Economies*, XLIV - 3, (September): 306-28.

- Jaffree, D. (1985). Export Dependence and Economic Growth: a reformulation and respecification. *Social Forces* 64, 102-18.
- Jung, W. S. and Marshall, P. J. . (1985). Exports, growth and causality in developing countries. *Journal of Development Economics*, 18, 1, (May/ June): 1-12.
- Kavoussi, R. M. (1984). Export expansion and economic growth: Further empirical evidence. *Journal of Development Economics* 14, 1/2, (January/February): 241-50.
- Kemal, A. R.; Musleh ud Din; Ushman Qadir; F. Lloyed; and S. Colombage Sirimevan . (2002). Exports and Economic Growth in South Asia. A study prepared for the South Asia Network of Economic Research Institutions.
- Kravis, I. B. (1970). Trade as a handmaiden of growth: Similarities between the nineteenth and twentieth centuries. *Economic Journal*, 80, 320, (December):850-72.
- Lussier, M. (1993, May). Impacts of exports on economic performance: A comparative study. *Journal of African Economies*, 2, 106-127.
- M. Shafiullah and R. Navaratnam. (2016). Do Bangladesh and Sri Lanka Enjoy Export-Led Growth? A comparison of Two Small South Asian Economies. *South Asia Economic Journal*, 114-132.
- Mochos, D. (1989). Export expansion, growth and the level of development: An empirical analysis. *Journal of Development Economics*, 30, 1, (January): 93-102.
- P.R., H. E. (1985). Market Structure and Foreign Trade. *Cambridge (mass):MIT press*.
- Palley, T. I. (2002). *A New Development Paradigm: Domestic Demand Led Growth, discussion paper*. Albuquerque, New Mexico: Foreign Policy in Focus.
- Phillips, P., & Perron, P. (1988). Testing for Unit Root in Time Series Regression. *Biometrika* 75, 335-346.
- S. Bakari and F. Saaidia. (2016). *Evaluation of Trade Influence on Economic Growth in China: A Time Series Analysis*.
- Serven, A. K. (1968). The Relation of Exports and Economic Growth: Comment. *Kyklos*, 21, 3, 546-48.
- Shan, J., & Sun, F. (1998). On the Export-Led Growth Hypothesis: The Econometric Evidence from China. *Applied Economics*, 30, 8, (August): 1055-65.
- Stock, J., & Watson, M. (1993). A Simple Estimator of Cointegration Vector in High Order Integrated System. *Econometrica* 61:4, 783-820.
- Syron, R. F. and Walsh, B. M.;. (1968). The Relation of Exports and Economic Growth: A Note. *Kyklos* 21,3, 541-45.

- Toda, H., & Yamamoto, T. (1995). Statistical inference in Vector Autoregressions with possibly integrated processes. *Journal of Econometrics* 66, 225-250.
- Tsen, W. H. (2010). Exports, Domestic Demand, and Economic Growth in China: Granger Causality Analysis. *Review of Development Economics* 14 (3), 625-639.
- Tyler, W. G. (1981). Growth and export expansion in developing countries: Some empirical evidence . *Journal of Development Economics*. 9, 1, (August): 121-30.
- Van den Berg, H. and Schmidt, J. R. . (1994). Foreign trade and economic growth: Time series evidence from Latin America. *Journal of International Trade and Economic Development*, 3, 3, (November): 121-30.
- World Bank. (1993). *The East Asian Miracle: Economic Growth and Public Policy*. Oxford: Oxford University Press.
- World Trade Organization Secretariat. (2013). *Trade Policy Review of Suriname*. WTO.
- Xu, Z. (1996). On the causality between export growth and GDP growth: an empirical reinvestigation . *Review of International Economics* 4, 172-84.

Appendices

Appendix 1: Description of Variables

| Indicator | Definition | Source | Expected Sign |
|-----------|---|---|---------------|
| GDPC | Log of per Capita Real GDP (2007 prices) | Statistical Tables of the Central Bank of Suriname (2016) | N/A |
| CRD | Log of Credit to the Private Sector (2007 prices) | Statistical Tables of the Central Bank of Suriname (2016) | + |
| EXPT | Log of Exports of Goods (2007 prices) | Statistical Tables of the Central Bank of Suriname (2016) | + |
| GE | Log of Government Expenditures (2007 prices) | Statistical Tables of the Central Bank of Suriname (2016) | + |
| GINV | Log of Government Investments (2007 prices) | Statistical Tables of the Central Bank of Suriname (2016) | + |

Appendix 2: Descriptive Statistics

| | GDPC | CR | EXPT | GE | GINV |
|--------------|----------|---------|---------|---------|--------|
| Mean | 14374.99 | 1476.71 | 2841.25 | 2008.11 | 300.60 |
| Median | 14000.16 | 1309.06 | 2638.35 | 2035.25 | 293.27 |
| Maximum | 18493.97 | 2533.85 | 5872.36 | 2892.94 | 737.73 |
| Minimum | 12049.22 | 365.04 | 567.26 | 792.78 | 8.07 |
| Std. Dev. | 1947.45 | 616.24 | 1141.58 | 486.12 | 186.64 |
| Skewness | 0.76 | 0.23 | 0.54 | -0.21 | 0.28 |
| Kurtosis | 2.39 | 1.81 | 3.31 | 2.27 | 2.11 |
| Jarque-Bera | 5.08 | 3.05 | 2.39 | 1.31 | 2.10 |
| Probability | 0.08 | 0.22 | 0.30 | 0.52 | 0.35 |
| Observations | 45 | 45 | 45 | 45 | 45 |

Appendix 3: Unit-Root Test Results

| Variable | ADF (intercept) | | ADF (trend & intercept) | | PP (intercept) | | PP (trend & intercept) | | Conclusion |
|----------|-----------------|----------|-------------------------|----------|----------------|----------|------------------------|----------|------------|
| | Level | Δ | Level | Δ | Level | Δ | Level | Δ | |
| GDPC | 0.90 | 0.11 | 0.95 | 0.30 | 0.79 | 0.00 | 0.89 | 0.00 | I(1) |
| CRD | 0.20 | 0.00 | 0.49 | 0.00 | 0.47 | 0.00 | 0.78 | 0.02 | I(1) |
| EXPT | 0.07 | 0.00 | 0.07 | 0.00 | 0.08 | 0.00 | 0.09 | 0.00 | I(1) |
| GE | 0.31 | 0.00 | 0.62 | 0.00 | 0.30 | 0.00 | 0.44 | 0.00 | I(1) |
| GINV | 0.13 | 0.00 | 0.34 | 0.00 | 0.11 | 0.00 | 0.31 | 0.00 | I(1) |

ADF test and PP test results present p-values

Appendix 4: VAR Lag Length Results

| Lag | LogL | LR | FPE | AIC | SC | HQ |
|-----|--------|----------|--------|---------|---------|---------|
| 0 | 3.310 | NA | 0.003 | -0.062 | 0.020 | -0.032 |
| 1 | 57.359 | 100.377* | 0.000* | -2.446* | -2.197* | -2.355* |
| 2 | 60.884 | 6.211 | 0.000 | -2.423 | -2.009 | -2.271 |
| 3 | 61.025 | 0.234 | 0.000 | -2.239 | -1.660 | -2.027 |

* indicates lag order selected by the criterion
 LR: sequential modified LR test statistic (each test at 5% level)
 FPE: Final prediction error
 AIC: Akaike information criterion
 SC: Schwarz information criterion
 HQ: Hannan-Quinn information criterion