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CAN A CURSE BECOME A BLESSING?
NATURAL RESOURCE DEPENDENCE AND AID IN THE CASE OF SURINAME

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LIST OF ACRONYMS

ODA	Official Development Aid
FDI	Foreign Direct Investment
RC	Resource Curse
DD	Dutch Disease
MSF	Mineral Stabilisation Fund
NRF	Non-renewable Resource Fund
SURALCO	Surinam Aluminum Company
ALCOA	Aluminum Company of America
IBA	International Bauxite Association
DFL	Dutch Guilders
SFL	Surinamese Guilders
US$	United States Dollars
SAP	Structural Adjustment Program
IMF	International Monetary Fund
GDP	Gross Domestic Product
UNDP	United Nations Development Program
CBMOD2	Central Bank of Suriname Model version 2
WDI	World Development Indicators
OLS	Ordinary Least Squares
3 SLS	Three-Stage Least Squares
ADF	Augmented Dickey-Fuller
BG-LM	Breusch-Godfrey Lagrange Method

CHAPTER I SCENE AND SCOPE OF RESEARCH

I.1 Introduction

The majority of the available literature describing the vast financial flows into many developing countries, which inflows originates from natural resource export receipts, foreign direct investments (FDI), and Official Development Aid (ODA) have not yet illustrated the possibility of a case where both phenomena simultaneously could cause growth or more specifically exports to deteriorate. First, it is important to state that ODA in this study refers only to Dutch development assistance, which is by far the largest of all ODA flows to Suriname. These failures (growth and exports) are the core of the Resource Curse Thesis (Auty, 1993) and Dutch Disease[1] theory (Neary and Van Wijnbergen, 1986).

Like many other countries on the South American mainland and the Caribbean Archipelago, Suriname has been natural resource dependent since the country was first colonized[2]. In the early creation of the colony, the Dutch established a plantation economy based on the production[3] of agricultural-crop products like sugar, coffee, cotton and cocoa. Thereafter, the country became mineral and ODA dependent practically throughout her entire post-plantation economy existence. This dependence is illustrated in Table I.1.

Table I:1 – Mineral Dependence Index (%)

Mineral share of:	1966-1974	1975-1980	1980-1986	1987-1991	1992-1996	1997-2001
GDP	32.1	20	6.7	3.3	5.2	6.2
Exports	85.4	77.5	76.2	72.5	75.2	71.3
Revenues	37.1	35.9	19.2	7.2	19.2	11
Index	51.5	44.5	34.0	27.7	33.2	29.5

Note: the figures from the periods 1966-1974 and 1975-1980 are taken from the multi-annual report 1957-1982 of the Central Bank of Suriname
Source: General Bureau of Statistics; IMF; Central Bank of Suriname

[1] It refers to the negative affect of sudden large revenues from natural gas discoveries in the North Sea on the Dutch economy.
[2] Note that a distinction is made between "natural resource abundance" and "natural resource dependence".
[3] Production brought forth by a combination of foreign (Dutch) capital and slave labour (imported from Africa)

The mineral dependency can be illustrated by a simple index namely the mineral dependence index (Auty; 1993), which is an average of the shares of:

a) mineral production value in total production (GDP at factor cost);
b) mineral export value in total exports; and
c) government receipts from the mineral sector in total government revenues.

This dependency also discloses the significant impact of natural resources on a number of key macroeconomic indicators like exports, economic growth and government expenditure (also consumption).

In Table I.1 this index is illustrated for four distinctive periods, namely:

1. 1966-1974: pre-independency period, social disturbance and aluminium production;
2. 1975-1980: Independency, political instability, increasing ODA inflows and booming bauxite rents
3. 1980-1986: military regime and deteriorating commodity prices;
4. 1987-1991: democratic government and pre-structural adjustment;
5. 1992-1996: structural adjustment and monetary stability and;
6. 1997-2001: fiscal- and monetary expansion policies combined with deteriorating commodity prices.

The first two periods[4] do not coincide with the periods that are been considered in this study. However, due to data availability, analytical purposes and the fact that these periods are not that much different than those described in this study (1970-1974 and 1975-1979) this distinction was used.

Complementary, the dependence of Suriname on ODA will also be looked at for the above described periods (Table I.2) to finally have a concept of the narrow foreign exchange inflow foundation the republic has since its naissance.

[4] From the Central Bank multi-annual report 1957-1982.

Table I:2 – Official Development Aid (%)

Aid as a Share of:	1966-1974	1975-1980	1980-1986	1987-1991	1992-1996	1997-2001
GDP	6.5	9.5	4.0	0.8	11.7	2.9
Capital Account Balance	76.1	161.7	49.5	79.2	44.2	6.7
Financing Deficit Government	100.1	97.0	38.2	8.8	-90.3	n.a.

Note: 'n.a.' no cash basis government financial figures available
Source: Central Bank of Suriname; IMF and own calculations

Therefore these dependencies can be signals for the Resource Curse (RC) and Dutch Disease (DD) phenomenon in a developing economy like the Surinamese. This urges to trace the existence of the main determinants of the RC-thesis and DD for this particular economy for the period 1970-2001. It is noteworthy to state why a conventional DD-index was not calculated for Suriname because of two reasons:

1. The (sectoral production and employment) data that was needed to calculate this index was not sufficiently available;
2. The DD-index calculation inherently assumes that the non-mining tradable (e.g. agriculture) sectors are fully competitive. This was not the case in Suriname[5].

I.2 Research Objectives and Contribution

I.2.1 Objectives

This paper attempts to investigate if and how vast aid inflows combined with export revenues from minerals export, negatively affect important economic variables, in this specific case the real exchange rate, investments and hence economic growth in the period 1970-2001. The structure and disbursements of ODA in the same period will be explored. Additionally, analysis of the impact of these two foreign exchange sources on the real exchange rate, and thus on exports competitiveness will be done. This means that not only the direct effect of these capital flows on growth will be investigated, but also some of the channels through

[5] Substantial agricultural exports (e.g. rice and banana) to the protected EU/ACP markets

which they indirectly effect growth will be investigated. Hopefully, policymakers can then learn lessons from history and observe why Suriname did not reach the level of development that was predicted, promised and expected after independence (Van Schaaijk et al; 1984). Nevertheless, it is acknowledged that it is inevitable to draw reserved general conclusions on this matter, since many other factors that can and actually are affecting growth, beside natural resource exports and aid, are left out of the analysis.

The appropriate theories for explaining the Surinamese case will have to capture and emphasize the dynamics of transfers- and resource-abundant economies. These theories can be categorized in two large groups of models namely:

- Dutch Disease models; and
- Political Economy models.

"The cross-country evidence, however, needs to be complemented by time series evidence to study the impact of commodity booms on long term growth. This is potentially an important issue because it is an open question whether the observed negative association between growth and natural resource abundance is due to the fact that natural resource abundant countries are more likely to experience booms, busts and the accompanying uncertainty, or whether something else about resource abundance causes slower growth over the long term." From Sachs and Warner (1999; p.44)

This statement was an incentive for this study to use time-series analysis to investigate if indeed in the case of Suriname, in the last 30 years, something else about natural resource abundance and aid flows causes growth to slow down. Therefore some of the channels as earlier stated will be looked at.

In the light of sustainable development financing, this study is also exploring the possibility of a mineral stabilization fund to capture future natural resource windfalls, instead of absorbing these economically, by irreversibly increasing consumption and investment. The successful implementation of such funds in several countries will be looked at and emphasis will be on the effective management of such funds and the possible use of the funds to, among others:

1. diversify the economy;
2. protect the economy against commodity price fluctuations.

I.2.2 Contribution

This study can contribute to policy formulation since current developments in Suriname encompass some significant agreements with multinationals for the exploration, exploitation and export of e.g. bauxite, gold, palm oil and crude oil. Ongoing is also the evaluation of the development cooperation between Suriname and The Netherlands. The political evaluation is in the final phase, while the long term macroeconomic impact of aid has not been comprehensively assessed yet. Also not in this study, since it is outside the scope of this paper to analyse in detail for instance the impact of particular programs on the development of Suriname. Hopefully, this study will benefit to a broad and constructive discussion on the financing of development in Suriname.

I.3 Aim and Constraints of the Paper

I.3.1 Main Focus

Many experts on Resource Curse and Dutch Disease assume latently that the availability of natural resources and large aid flows to developing countries inherently embodies attributes that harm growth and development. And that many in fact argue that it is a curse for developing countries to have natural resources, because the necessary safety nets embodied by institutions and development policies are not yet developed. And so these assumptions disregard the fact that small economies like the Surinamese' had nothing else then the natural riches to start their development with. And that certainly in the beginning phase of development they would be totally dependent on these resources. That is why this paper critically assesses the different theories not in isolation, but based on the empirical evidence of one particular natural resource and aid dependent economy. It makes an attempt in illustrating the transmission mechanism through which these dependencies can affect growth.

I.3.2 Constraints of the Study

The relatively short time interval allocated for this thesis, will hamper efforts for more comprehensive analysis of the matter. Also, impediments with respect to data collection of Surinamese and international statistical institutions, are reflected in the amount of time spend to enhance the data quality. As such, the quantitative analysis is constraint by on a number of assumptions.

Many events in the Surinamese economic history also influenced the shape of the time series used for the study. Moreover, since in many instances entire time-series were not available from one source, sub-series from different periods and different data sources were joined. As such, irregularities occur in the data, which may feature structural breaks induced by events. In reality these are not structural breaks.

Another conceptual constraint relates to the use of time series analyses instead of cross-section (-country) or panel data analysis. Crucial findings that for instance challenge the theory cannot be generalized, since only one country with its specific characteristics and unique circumstances is involved.

I.4 Relevance

This study is relevant for development analysis and policy because:

a. the difficulties in measuring economic variables and relationships;
b. the illustration of some channels and variables through which natural resource exports and aid inflows are linked to growth;
c. how these channels could be influenced by policies; thus
d. formulating and directing fiscal, monetary, exchange rate, trade, investment and manufacturing policies towards sustainable development.

I.5 Outline of the Study

The presentation and organization of the distinctive parts of this study are as follows:

Chapter II covers the theoretical framework together with the literature review. It briefly reviews the historical and current approaches of the Resource Curse hypothesis and aid dependence and remedies that can off-set their negative effects.

In Chapter III the specific country case of Suriname is reviewed. This is been conducted within a socio-economic and political framework.

Chapter IV investigates some of the alleged channels through which aid and natural resource rents can affect economic growth, together with the data analysis.

Chapter V presents an econometric model in which aid and natural resource rents' effects on economic growth are been tested.

Finally in Chapter VI some alternative approaches of assessing the Dutch Disease and Resource Curse phenomena are reviewed, based on one country's case.

CHAPTER II A THEORETICAL FRAMEWORK OF THE NATURAL RESOURCE AND AID ABUNDANCE DILEMMA

II.1 Introduction

Frequent occurrence of stagnating or slow economic growth in many countries with significant amounts of natural resources and development aid resources led to vast amounts of studies which try to explain this obvious contradiction. Opposite to that, resource poor countries on average have proven to grow faster. This is dubbed the Resource Curse hypothesis[6]. The contradiction exists in the fact that it seems logical that natural riches automatically create national wealth and prosperity as explained by Sachs and Warner (1995). Traditionally the same has been argued for development aid since its purpose was to enhance economic growth for the recipient country (Vos; 1994).

Ning and Field (2004) found that it is not just the availability of natural resources that affects growth. Building upon Sachs and Warner's (2001) analysis, they describe the channels through which possibly growth can be affected by resource abundance. It is when resource abundance (determined by nature) turns into resource dependence (economically and politically determined). And actually it is this resource dependence (and aid dependence) that is the foundation to the Resource Curse thesis and hence the Dutch Disease theorem. Analogically to this, the (economic growth hampering effect of) aid dependence can be described. It is sometimes measured as a share of government revenue or government financing capability. Considering all the above, the main culprit appears after a (temporary) boom or inflow surge when the economy had to adjust to pre-boom levels of consumption and investments.

The theoretical framework will focus on two distinct views namely:

a. the link between mineral and aid dependence and growth;

[6] This is the failure of a country to economically maximize on a favourable abundant resource resulting into worse economic performance than other less or not naturally endowed economies (Auty; 1993)

b. the role of institutions, especially those institutions that can materialize the stabilization potential, and latent sustainable development capacity of resources such as mineral stabilization and or savings funds (or non-renewable resource funds (NRF's)[7]) which in turn can reduce the impact of unstable revenues on the economy and prevent growth collapse on the long run.

Besides, some literature will be reviewed with respect to the history of resource dependence.

II.2 Mainstream Theories

II.2.1 Introduction

It is important to distinguish the different theories that are the foundation of the Resource Curse hypothesis, since over the years these theories have developed rapidly. This development had to do with the fact that developed countries and developing countries, according to Stijns (2003), had different causes of and different experiences with Dutch Disease and the Resource Curse in general. While the developed countries dealt with more macroeconomic type features of these phenomena (like relative prices development), in the developing countries case it seemed like more political economy type issues (such as rent seeking and institutional functioning) were important. In the next section therefore, both branches will be viewed as they are captured in the mainstream theories on these phenomena.

II.2.2 The Dutch Disease (DD) Theory

The Dutch Disease theory explains exchange rates (nominal and real), price and wealth movements as a result of transfers (e.g. grants) or a resource discovery (Murshed (1997)). If in the DD theory these movements caused by the natural resource extraction activities are of an "enclave type" (e.g. bauxite sector in Suriname), and do not crowd-out other sectors on the production factor markets, they will coincide with the effects of large aid (grant) transfers. Neary and van Wijnbergen (1986) refer to an increase in investments and consumption to unsustainable levels that first result into growing domestic inflation. This happens as the demand for limited domestic non-tradable goods and services, triggered by a higher income

[7] International Monetary Fund (2001)

level, in the economy becomes greater (Gilles et al; 1983). Since relative prices are an inverse of the real exchange rate, a higher-than-world-inflation domestic inflation, will cause the real exchange rate to appreciate. This appreciation by itself can reduce the competitiveness of manufacturing (or agricultural) output and hence exports since prices of non-tradable inputs increase.

Learning-by-doing theoretical considerations as optimal subsidies financed out of windfall gains (e.g. a mineral stabilization fund) for manufacturing and agricultural sectors may be significant in the discussion about future development financing, since these sectors have the ability to innovate and benefit from new technology.

II.2.3 The Political Economy Considerations

These are illustrated within a framework of, according to Auty (1990), "regime and absorptive efficiency". Political regimes, institutions and policies (governance), geopolitical circumstances etcetera are considered to be important transmission channels between revenues from certain types of natural resources (Isham; 2002:"point-sourced and diffused resources") and economic growth. In the case of aid transfers these considerations are also evident especially when donor and recipient government objectives are not comparable. Recipient governments' and donors' behaviour can be illustrated by the affect of aid transfers (foreign savings) on expenditures and financing (Hjertholm et al; 2002). One eye catching aspect is the fact that not all foreign savings are used for investments. A well known phenomenon is aid fungibility, whereby freed up resources on the government budget as a result of aid transfers, are being allocated to non-developmental activities such as war spending or the increase of "ministerial wealth". But fungibility does not necessarily have to be negative in all cases as suggested in most of the related literature. As with natural resource rents, freed up resources can be invested in highly efficient activities, or allocated to funds, that embody sustainable development. It is again not the phenomenon by itself that causes the negative outcome, but a combination of in this case fungibility and bad policies (wrong choices).

II.3 Direct Channels

II.3.1 Official Development Aid and Economic Growth

The ultimate purpose for foreign aid was to enhance economic growth in recipient economies. Aid was given complementary to domestic savings, which are lacking in most developing countries due to difficulties in the accumulation of (physical) capital in these countries. This is clearly been illustrated by the Harrod-Domar two-gap model (Hjertholm et al; 1998). The rationale of the model is that in the existence of gaps, in this case a savings-investments and a foreign exchange (trade) gap, aid is granted to eradicate the gaps. Recently as a result of significant fiscal dimensions of the 1980's debt crisis, a third gap was introduced into the gap model called the fiscal gap (Agenor and Montiel; 1996).

Beside the affects of foreign aid on government fiscal behaviour such as fungibility[8], vast aid inflows (is public sector booming sector; Elbadawi (1999)) have caused real exchange rates to appreciate, which damages the competitiveness of the export sector resulting into Dutch Disease in some cases. According to some scholars this usually occurs if the increased inflows from aid[9] are used to purchase domestic non-tradable goods and services, causing price- and money inflation. Also, governments (usually the sole aid receiving agent) can crowd-out the private sector in the process of trying to sterilize the inflow of foreign exchange from aid by restricting the growth of banking credit to the private sector (analogically restricting investments).

Aid can also be used to broaden a developing economy's export base in an effort to close the trade gap. If these vast inflows are used for imports, since a developing country can not produce all capital goods needed for production (and hence required growth) domestically, the result can be a capital account surplus (caused by incoming aid flows) that covers the deficit on the current account (trade gap) with no money supply implications (Younger; 1992).

But it also occurred that aid can cause the real exchange rate to depreciate, which is contrary to the Dutch Disease theory. Some evidence for that was found in Elbadawi's (1999) study of

[8] This can be explained as the diversion of aid resources to finance other fiscal expenditures (which were already budgeted in the absence of aid) than actually agreed upon within the development aid agreement between donor and recipient country.
[9] labelled by Elbadawi as 'unsustainable aid flows'

foreign aid dependent Sub-Saharan African countries. As such, aid inflows can decrease costs of non-traded goods like domestic transportation costs (e.g. upgrade of physical infrastructure) or increase the level of education. For that reason, this can enhance the productivity and competitiveness of the traded-goods sector (Hjertholm et al; 1998). McGillivray (1999) explains the rather positive feature of aid namely the steady link between aid and investment. Aid has financed a number of significant investments in social and physical infrastructure, which accordingly accommodated growth indirectly[10]. As such it can be argued that aid has an ambiguous effect on economic growth. Elbadawi's 1999 cross-country analysis found evidence of one of the key suggestions of aid effectiveness, namely that beyond a certain threshold of aid flows these can "hamper instead of foster economic growth and development in general". Therefore, countries suffering from chronic balance of payments deficits (like Suriname) need to be cautious in accepting unsustainable foreign exchange inflows from ODA to finance these deficits, since misalignments between these inflows and the country's absorptive capacity for instance can induce real exchange rate appreciations.

II.3.2 Natural Resources and Economic Growth

The negative effect of a resource boom on growth has been the prime subject of discussion in an increasing amount of development economics literature.

Isham et al (2002) distinguish between the kind of natural resource that are available in an economy namely point-source and diffuse economies. According to Murshed (2003) this distinction focuses predominantly on the manner in which rents are redistributed. Point-source activities take place in one particular area (e.g. a mine or plantation) or factory and as such can be easily taxed. Another earlier stated feature is that point-source activities usually are "enclave" activities and as such have no or minimal linkages with the rest of the economy. Therefore, the concentrated potential wealth does not reach communities. Contrary to this, diffused resources such as agricultural crops (except plantation crops) are usually more scattered and less vulnerable to rent siphoning. These activities are more labour intensive and widespread. In other words, diffuse resources have more potential to redistribute wealth.

[10] Regression analysis (see chapter V) in the case of Suriname reveals that there is a significant relationship between aid and capital expenditures (or public investments)

In Murshed (1997) the Dutch Disease process is technically described and analyzed by the Dornbusch model of exchange rate behaviour under flexible exchange rates. In this framework the booming sector revenues are included in the existing Mundell-Fleming IS-LM, model to illustrate some of the dynamics (such as wealth effects) of the Dutch Disease. But a more comprehensive description of the Dutch Disease effects was given by Corden and Neary (1982) and Neary and van Wijnbergen (1986). They distinguish:

a) A spending effect and;

b) A resource-movement effect.

Spending effect

A resource boom leads to a rise in income. With regard to development aid, the government as a recipient of aid inflows is regarded to be the booming sector, crowding out the private sector. When an income increase translates itself into an excess demand of non-tradable goods and services, the relative prices in the economy and hence the real exchange rate will rise, forcing the export and production of the existing tradables (e.g. manufacturing, agriculture) down. The production decrease is also referred to in the literature as de-industrialisation, since industries are destroyed by the high spending.

Resource-movement effect

The establishment of a new booming sector requires significant resources (e.g. inputs and labour). If this booming sector operates within an enclave, it will not depend significantly on factors of production which are used in other sectors (Neary and van Wijnbergen; 1986). In many cases natural resource sectors are enclave type activities with little or no forward and backward linkages to the rest of the economy. Resource migration (e.g. labour) usually takes place when higher prices (wages) are paid for these resources by the booming sector. However, if the booming sector is a high-tech, productivity increasing sector that requires highly skilled and specialised labour which cannot be extracted from other sectors in the economy, the resource-movement effect will be absent.

II.4 Indirect Channels

In this section an attempt is made to illustrate some of the transmission channels through which natural resource and aid dependence affects growth. In their 2004 analysis of these transmission channels, Ning and Field claim that natural resources by themselves have a positive relationship with per capita growth. Also contrary to the established line of thinking, Papyrakis and Gerlagh (2003) argue that natural resource abundance can be bad for growth if its impact on growth is considered in isolation. They suggest that by including other explanatory variables like investments, openness and schooling the relationship can turn out to be positive. They illustrated and assess the functioning of the channels through which growth can be affected by natural resources. Separately, the effect of natural resources on each of these channels was estimated. And once the impact of natural resource abundance on other explanatory variables is considered, the on average negative relationships between this abundance and these variables outweigh the positive direct relationship between natural resource abundance and income growth. Hansen and Tarp (2001) used a similar technique to investigate the transmission mechanism through which aid has an impact on economic growth.

A specific dimension associated to aid, distinguishes the manner in which resources from aid are used. In the case of resource rents, governments determine how those are spent, while with aid it is usually the donor entity (e.g. country, organisation) that directs the flow of aid to sectors or projects with or without any say from the recipient government (which is often conditioned by programs and agreements in channelling aid money). The only difference thus has to do with the ownership of the capital inflow, but the channels in general remain the same. Some of these channels are:

- investments;
- real exchange rate;
- institutions.

II.4.1 Investments Channel

Since many governments in developing countries do not have the capacity (savings and foreign exchange) to invest in infrastructure (social, physical etc.), often aid flows and natural resource rents (from taxes and royalties) are the last resort. In the case of aid, investments in infrastructure that reduce transportation cost or investments in education that enhance the educational and skill level of workers was earlier reviewed. In these situations investments can have a positive stimulus on growth. However, it frequently occurs that natural resource rents and aid flows are not invested efficiently. In some instances that is due to powerful interest groups that siphon off the rents for own purposes, and in other instances due to donor countries interest in cases were recipient government ownership of aid programs is weak. Of course these donor interests are then not in line with the recipient country's interests. Many aid reforms emphasize this ownership problem that hampers aid effectiveness (e.g. Elbadawi; 1999).

In the case of Suriname several unique events seemingly contradicted some dogmatic believes. It may occur that natural resource rich countries tend not to accumulate capital domestically, such as investments in education (human capital) (Gylfason; 2001), but in the Surinamese case these investments came frequently from ODA (e.g. building of schools).

High resource rents according to Sachs and Warner (1997) can encourage governments in developing countries to setup protected government industries (state-led enterprises) to offset Dutch Disease like effects. These industries also called in the literature "infant industries" are protected by tariffs, subsidies and more. Many of these industries failed to mature fast as a result of a lack of linkages with the rest of the economy and there capital intensity.

A resource and or aid windfall can augment expectations about future sustainable income and wealth and hence, discourages governments to establish prudent savings and investment policies.

In many cases were investments resulted in rapid per capita income growth and development, forward and backward linkages to domestic manufacturing and market guided domestic industrialisation played a significant role as was the case in the 'regions of recent settlement' (United States of America, Canada, Australia and New Zealand) (Murshed; 2003). The same occurred in the more diffused and manufacturing-based economies in East Asia (e.g. the Asian Tigers). This is said to be the main difference with the so called government established and protected domestic (infant) industries in other regions in the world such as Latin America and the Caribbean.

II.4.2 Real Exchange Rate (RER) Channel

Foreign exchange inflows from aid and or a natural (read also mineral) resource export boom will at first increase the international reserves and thus the supply of foreign exchange. Thereafter, the nominal value of the domestic currency in foreign exchange terms may be enhanced (appreciation) if domestic demand remains unchanged. If their is a spending effect that is associated to the resource boom, a domestic demand increase for good and services is inevitable and can result in domestic price inflation. Note that prices for tradables are set on the international commodity market meaning that in a small country (price-taker) case these will not be affected by domestic inflation. Hence, prices of non-tradables will increase relative to prices of tradables which leads to a real exchange rate appreciation, meaning a decline in the real exchange rate if it is formulated as follows (Auty and Mikesell; 1998, p. 23):

$$RER = \frac{price\,index\,of\,tradable\,goods\,and\,services}{price\,index\,of\,non-tradable\,goods\,and\,services}$$

This appreciation of the exchange rate can increase domestic cost of production as earlier mentioned because of domestic inflation. Like in Suriname, many developing countries then tried to defend the nominal exchange rate by the introduction of foreign exchange and capital controls, or protective policies for domestic industries like import substitution. Besides, ten Berge (1991; p.16) describes the above in the context of the RER being a "*price incentive for resource allocation between tradables and non-tradables*", which it is since an appreciation or depreciation shifts demand and thus production from one sector to another.

Since production and so exports of a mineral resource booming sector cannot remain on the same level as during a boom for a prolonged period thereafter, production and exports from the non-mineral sector should compensate for the decreased share of the mineral sector in the economy. However, if these sectors are hit by a real exchange rate appreciation, their production cost will increase which may decrease production and render their exports uncompetitive. Accordingly, their share in total output and total exports decrease resulting into slower or even negative growth.

II.4.3 The Institutions Channel

Acemoglu, Johnson and Robinson (2001) use settler mortality rates as a proxy to argue the shape of the institutions that would probably occur in former colonies. They argued that were settlers' mortality was high it was likely that extractive states would be established. Colonizers did not want to settle in areas were there health or life was constantly threatened by diseases, natural disasters or other dangers. Accordingly, institutions were shaped to accommodate this type of colonization. These institutions did not stimulate domestic capital accumulation and savings, but instead promoted the relocation of resources from the colony to the colonizer. Murshed (2003) later effectively formulated this as bad policies produced by bad institutions, which can cause the Resource Curse. Decades later these institutions or at least their remnants still affect economic development in many former colonies. In 2002 the Business Forum Workgroup in Suriname[11], a public-private partnership that among other things, evaluated the business environment of the country, listed about 100 laws (some dated as far back as the post-slavery colonial era) that actually obstruct the establishment of competitive domestic and foreign businesses on one hand and constraints governments' capacity to transform the economy in order to encourage and accommodate business initiatives on the other hand[12].

While many of the literature on the role of institutions in the Resource Curse discussion (like Kaufman, Kraay and Zoido-Lobaton; 2002), refer to institutions as to be among others voice

[11] Diagnos: Suriname: Private sector development strategy; February 2002

[12] Diagnos (2002): Quote: "Legislation is old and are most of the time obsolete Dutch Laws, lacking modern principles and instruments of commercial law and ignoring the in build social, economic and political environment of the country". For example legislation on intellectual property is still governed by the Royal Ordinance (Regulation for Industrial Property, 1912) of August 19, 1912, amended by Decree of August 31, 1984. In many other important areas, the regulatory framework is weak or non-existent. This is particularly the case of the labour legislation and competition policy.

and accountability, rule of law and good governance. However, in this paper some effort is made to investigate the importance of (domestic) capital accumulating or resource rents redistributing institutions such as mineral stabilization funds.

II.5 Political Economy Of Rents Deployment

II.5.1 State Structures and Rents Deployment

This section of the theoretical framework takes off with Lal's[13] distinction of two kinds of states based on two fundamental criteria:

a. long run welfare maximization
b. and the service of sectional interests.

He labelled these states the autonomous or benevolent (developmental) state contrary to the factional or predatory state. The autonomous state seems to occur more in countries with poor or no resource endowment and tend to pursuit sound economic and other policies by concentrating on investments efficiency. Much of this can be subscribed to the population in these countries that will not tolerate the misuse of scarce resources and unfair wealth distribution. These states pursue developmental objectives either, promoted and facilitated by the state, directly organized by the state or a combination of both (Leftwich; 1995). Factional states however tend to be less disciplinary with both short run government policies in general and policies that encourage sustainable development. Rent transfers to so called resource based industries (Auty and Gelb; 2001) that were protected as infant industries in resource-rich countries were in fact primary sector export receipts of the government, channelled to certain elites close to these administrations. Like in other countries, as said earlier, in Suriname the maturation process of these infant industries was long or absent. Besides, these industries were capital-intensive and thus strongly dependent on rents[14] from primary sector mineral exports.

[13] Quoted in Auty and Gelb (2001)
[14] In many instances channeled through government subsidies

II.5.2 Stabilization Funds as Rent-Capturing and Deployment Mechanisms

All the above actually implicates that rents can be deployed in different manners. Even in situations were externally or internally induced distortions, such as fluctuations in export prices and government revenues, can be dealt with. Auty and Mikesell (1998) advocate a combination of proper monetary and fiscal policies to shield of the effects of the above described features of mineral dependency. In addition to these policies, they also proposed mineral (reserve) stabilization funds (MSF). These funds can serve different purposes namely:

1. finance government expenditures in periods of deteriorating revenues;
2. stabilizing foreign exchange expenditures;
3. balanced distribution of rents between consumption and investments;
4. preventing real exchange rate fluctuations;
5. finance diversification of an economy.

The first four points usually regards developing countries in the early stages of development, when these economies are totally dependent on mineral revenues. Sharp falls in expenditures, imports and other foreign exchange payments (e.g. debt service) can be avoided if reserved funds from booming revenue periods are used to maintain a certain level of expenditures in periods of revenues decline. The IMF (2001) claims that in the presence of such funds government expenditures are likely to be less correlated to changes in natural resource export earnings than in countries without these funds.
But these funds are also constraint in their accumulation of rents since increase or decrease of these rents depends on whether there is a mineral export windfall or not.

According to Auty and Mikesell (1998), contributions to or disbursements from these funds should be really fine tuned since export prices for many primary exports are on the long run unstable according to the Prebish terms-of trade argument (Auty and Mikesell; 1998). This argument called after Raul Prebish, a structuralist school oriented Latin American economist believed that as a result of lower income elasticities for primary products exports from the developing world (so called "periphery"), developing countries would eventually be confronted with deteriorating terms of trade relative to exporters of manufactured goods from the developed world (so called "center") (Agenor and Montiel; 1998). The main policy

recommendation was to create protected industries (see earlier "infant industries" and import-substituting strategies). In many countries this led to an unbalanced allocation of resource rents to uncompetitive, foreign-exchange guzzling industries which frequently never reached "maturity" levels.

The successful resource abundant economies like Botswana, Norway, Indonesia and Malaysia, however, formulated policies that fostered a more balanced distribution of rents between consumption and investments (competitive industrialisation, infrastructure, and human capital (Murshed et al; 2004)). Investing mineral rents in the diversification of export sectors usually becomes an option when a certain level of stability is reached with respect to government revenues and expenditures and the external balance of payments.

In order to stabilize the level of funds available in the MSF some of the funds should be invested abroad. It goes without saying that these funds will be held in foreign exchange, which should become available in periods of foreign exchange expenditure deficits.

Auty and Mikesell (1998) argue that MSFs should be managed by professionals (e.g. the Central Bank and other financial specialists) and invested abroad in foreign equities with higher than domestic rates of return. More concrete is the IMF (2001) suggestion of investments in commodity risk markets with instruments like:

- Futures contracts;
- Options contracts;
- Commodity swaps;
- Commodity bonds or loans; or a
- Hybrid of instruments.

In addition to that, any form of political interference should be excluded[15]. Empirically this seems not plausible. Governments will want to and shall have a say in how such a fund is managed since beside extractive firms, the government also contributes by the allocation of part of mineral taxes to the MSF. Besides, it is mainly the responsibility of the government to (re)distribute national wealth as equal as possible and to ensure and facilitate sustainable development as was the case in Botswana in the 1980's (Hill;1991).

[15] Auty and Mikesell (1998: p.42) in fact contradict themselves by stating later that"The government is also responsible for how its share of the mineral rent is used (or absorbed)."

CHAPTER III EMPIRICAL OVERVIEW AND ANALYTICAL FRAMEWORK OF SURINAME

III.1 Introduction

Suriname is located on the Northern coast of South-America, bordering the Atlantic Ocean in the North, French Guyana in the East, Brazil in the South and Guyana in the West. Small with respect to the amount of inhabitants (approximately 433.000), the country is relatively large in surface namely 163.000 square kilometres. It started as a staple export (plantation) economy and remained that way for the main part of its history under Dutch colonization. Beside some small scale, alluvial gold exploitation there was no significant mining activity until the end of the first half of the 20th century. Richly endowed with several natural resources, the country's first encounter with the exploitation of these vast resources started in the sixties with the large foreign direct investments from two multinationals, Suralco (Surinam Aluminum Company, a subsidiary of ALCOA) and Billiton (former Royal Dutch Shell branch). These investments in the bauxite sector set up an integrated bauxite industry. Hydro-power, together with the mining of bauxite formed the basis and the first stage of this integrated industry. Later on, the metal aluminium (derived from alumina) became the end product from the smelter.

In 1966, the *Brokopondoproject* started and it included the construction of a river dam called the *Afobakka* hydro-power plant, which provided energy for the bauxite sector in general and for the *Paranam* alumina refinery and aluminium smelter in particular. Nevertheless, alumina remained the main export commodity measured in export quantity and export value terms. The largest government earnings from this sector consisted of corporate profit tax, export tax, a levy on bauxite mining (abolished later) and some other small taxes.

A structural development cooperation emerged between the two countries, with vast amounts of development aid from The Netherlands (loans and grants), financing several development plans. In 1975, Suriname became independent and co-signed a development agreement with the Netherlands. This agreement, included among other things, an approximately NLG 3.5

billion grant to be disbursed in 15-20 years thereafter, with the purpose to diminish the development gap between the two nations.

This study focuses on the period between 1970 and 2001. Through data analysis some effort is made to visualize the dynamics and effects of aid and natural resource dependence in the Surinamese economy.

Because of data and other constraints, this analysis will lack some profundity and if it was mainly based on some assumptions, extra- and interpolations would undermine the credibility and robustness of the final results, conclusions and recommendations. To illustrate this, the following example is used. Pronk (2001) argues that different modalities of aid such as project aid or programme aid will have a different impact on growth, and as such it makes the discussion on the direct impact of aid on growth more complex. In the case of Suriname aid has proven to sometimes be positive on a micro level, aiming at a number of projects with positive outcomes in the Surinamese case, while on an overall macro (program) level the relationship seems to be adverse.

Most of the aspects that could not be covered in this analysis can be regarded as subjects for further study.

In the next section of this chapter a brief overview of the socio-economic and political background of the country will be given with some emphasis on the nature of the natural resource and development aid situation.

III.2 Data Sources, Socio-Economic And Political Situation In The Period 1970-2001

III.2.1 Take-off Situation

The natural resource and aid dependency of the country has frequently been considered inevitable since most naturally endowed developing economies in the world lacked other resources to fuel their economic growth and development processes. Related to their low level of income in the 'infant' phase of their development, they lacked the capacity to

accumulate capital and thus to invest. Moreover, the absence of institutions and policies that promote and ensure sustainable development was a detrimental factor in the struggle of these countries to prosperity. The just mentioned limitations with a structural character, together with restrictions related to (among other things) commodity markets access and the international division of labour, conditioned the production structure in the country.

III.2.2 Historical Socio-Economic And Political Developments

In Table III.1 hereafter, an overview is given of some key macroeconomic indicators that were of essence in studying the socio-economic and political situation in the six distinguished periods.

1970-1974: pre-independency, social eruptions and aluminium production

Large scale bauxite exploitation resulted in changes in the structure of the Surinamese economy. At the start this activity caused drastic increases in the national income (real GDP growth of about 20.0 % in 1966), but there were no significant linkages to the rest of the economy (Essed; 1973). Essed argues that profits from this private enterprise (the hydro-power plant) which were meant to be managed by an authority[16], were not invested in a way that would *"activate other natural resources or production sectors"* (Essed; 1973, p. 43). By 1970 real economic growth fell to 2.8 %. As soon as in this period it became clear that the aluminium industry was not established with the purpose to emerge later into an activity with wide spread dispersed spin off effects. It is worth mentioning that in 1974 a bauxite levy was introduced (stimulated and backed by the IBA) initially leading to higher government revenues in the next period (see Table III.1).

[16] A rent allocation fund type structure

Table III:1 – Key Macroeconomic Indicators 1970-2001
(Period averages in millions of SFL)

	1970-1974	1975-1979	1980-1986	1987-1991	1992-1996	1997-2001
Official Development Aid	42.3	123.9	68.9	24.5	14,535	25,060
*Bauxite Export Revenue**	288	483	559	620	67,975	342,948
Government Bauxite receipts	65.9	124.8	101.9	62.3	8,054	29,853
Public Consumption	138.0	302.2	542.3	838.5	30,127	207,206
Public Investments	35.5	129.3	112.0	57.6	5,941	29,732
Transfers and Subsidies	23.7	48.2	142.2	293.0	8,041	68,980
Gross Fixed Capital Formation	147.9	283.7	380.6	468.8	58,011	151,282
*Nominal Exchange Rate (BOP)***	1.83	1.79	1.80	1.79	202.49	1,033.34
*Real Exchange rate ** *	1.398	1.314	1.168	0.525	1.726	1.564
Inflation (in %)	8.6	9.5	9.6	21.8	158.1	44.6
Nominal GDP	647.3	1,299.2	1,742.2	2,999.7	123,874	865,641
*Per capita Nominal GDP****	1.71	3.58	4.70	7.46	293.6	1,934.3

*= total of Bauxite-, alumina- and aluminium exports
**=denoted as SFL per US$1
***=in thousands of SFL
Source: Imro San A Jong's Database, Central Bank of Suriname annual reports 1957-1995, own calculations;

In Chapter I the mineral dependence and the impact of the project on some macroeconomic indicators like the export sector, the balance of payments and the government revenues (see Table I.1) was illustrated. Nevertheless these developments did not prevent social and political unrest to emerge, which ultimately led to the formation of a new administration

which was later on also forced out of office due to social (e.g. massive strikes) and political eruptions.

An eye-catching fact was the substantial growth of civil servants in this period. Kruijt and Maks (2003) reported that the government in Suriname had employed 25.000 civil servants in 1974 while the actual amount of jobs was 15.000.

The earlier mentioned political unrest created a forum for independency movements to thrive and their influence ultimately would lead to the independency of Suriname in 1975.

1975-1979: Independency, political instability, increasing ODA inflows and bauxite rents

In 1975 Suriname became independent after events and conditions that some perceive as controversial, since:

- it was not an election issue in the elections of 1973, suggesting that probably people would have voted against independence if it was;
- it was a too significant and far reaching decision to be taken solely by two administrations (the Dutch and the Surinamese). A people's referendum was proposed by the political opposition back then.

The two governments agreed upon a treaty that was suppose to be the framework within which development cooperation would take place with the main purpose to enhance the Surinamese economy.

The purpose and targets of this cooperation for the next 10-15 years were formulated as follows by Kruijt and Maks (2003):

- diversification of manufacturing, productive sectors and agriculture, with some emphasis on rice cultivation should ultimately strengthen the Surinamese economy;
- the establishment of labour-intensive industries, agriculture and forestry should create a significant labour demand (of approximately 55.000 jobs) to battle the unemployment rates of 15-20 %;

- enhance living conditions through income redistribution and social transfers policies of the government since an estimated 50 % of the population lived under the poverty line;
- enhance regional dissemination to include larger area's of the country in the composition and generation of total domestic production;

The polarisation and aggravation between the main ethnic groups in the country, fuelled by politicians and representatives, became gruesome and explosive. The political instability combined with the uncertainty about the country's future, triggered many to emigrate to the Netherlands. Unfortunately, this exodus at the same time caused a "brain-drain". Many highly educated and skilled Surinamese left the country, which would prove later to be a significant setback in the country's development.

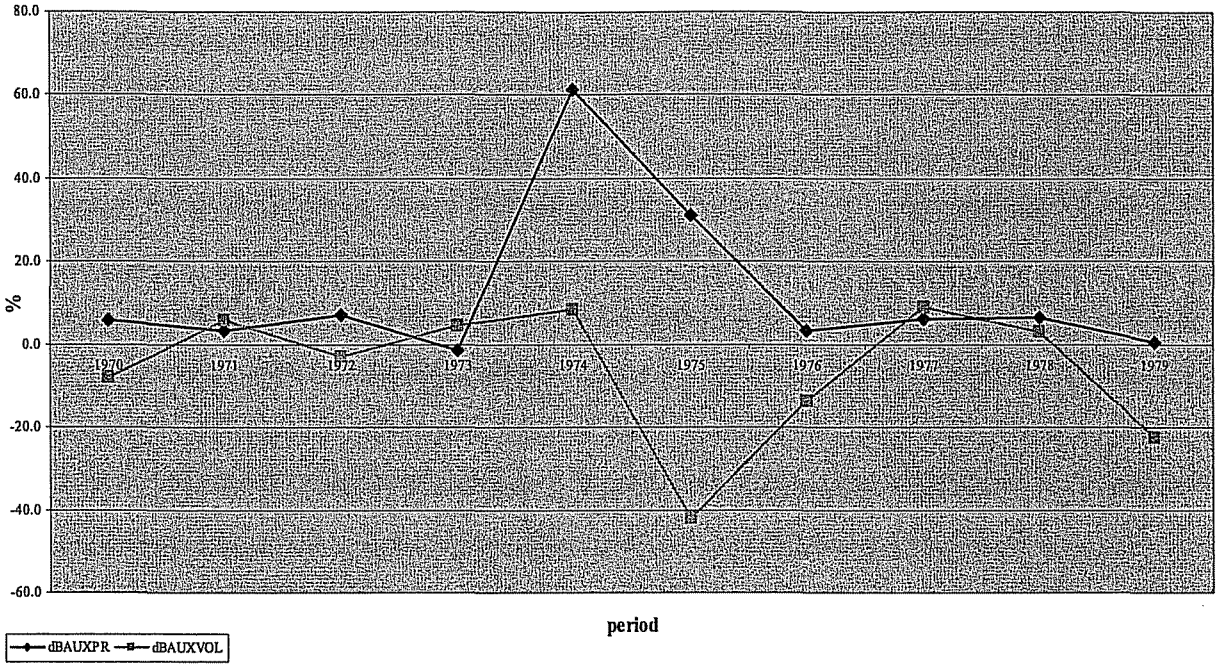
Unfortunately, migration did not slow down the growth of the government's workforce.

The increase of the government's workforce was apparently financed by rapidly increasing bauxite revenues of the government from the newly introduced bauxite levy in 1974 and booming commodity prices.

Higher bauxite prices (stimulated by the powerful IBA[17]), which would trigger higher supply, diminished the demand for bauxite and –derivatives. This is illustrated by bauxite and aluminium unit prices in Figure III.1 and III.2. It is clear that a combination of price increases (unfavourable for demand) and the introduction of the bauxite levy (unfavourable for profits) finally led to the export volume and thus the –values of bauxite and aluminium to decrease.

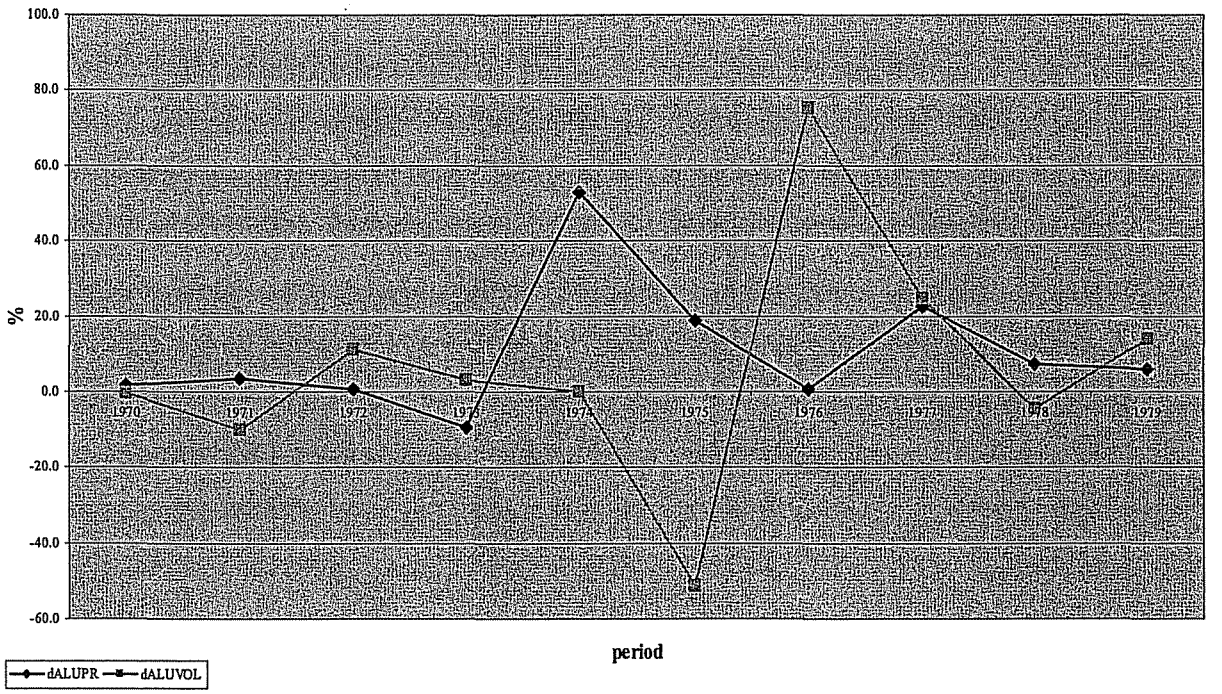
[17] IBA: International Bauxite Association (the "OPEC" of the bauxite producing countries)

Figure III:1 – Bauxite Price and Volume Change 1970 - 1979



Source: Author's Calculations

Figure III:2 – Aluminium Price and Volume Change 1970 - 1979



Source: Author's Calculations

The above analysis reveals that a combination of increased aid flows and higher mineral exports revenues resulted into sharply improved public sector revenues. Considering Sachs' and Warner's (1999, p. 50) measure "*where a realized growth of natural resource exports to GDP of at least 4 % of GDP from the beginning of the boom of these exports till the peak with a duration of at least three years*", this measure can be used for the Surinamese situation to trace episodes of resource booms and aid booms. In the case of Suriname it is interesting to observe the bauxite price- and development aid boom in the period 1976-1978, where real bauxite exports grew with an average of 6% and development aid with an average of 12 % (both well over Sachs'and Warners' 4 % benchmark). The next period however will prove to be far less flourishing.

1980-1986: Military regime, sharply increased commodity prices and aid politics

This interval sets off with a military coup, that was at first being hailed by the masses and the Dutch Government (e.g. increased aid disbursements, see Table III.2) after consecutive failures of the democratic government to maintain political and economic stability. It is notable that in 1981 and 1982 about 55 projects were approved to be ODA-financed, amounting up to respectively DFL 234 and DFL 262 million, which were believed to be larger than the government annual budget (Kruijt and Maks; 2003).

In 1981 under significant influence of the IBA international bauxite prices sharply increased (as in the previous period), which was obviously in favour of the commodity suppliers. But shortly thereafter the international economic recession suppressed demand further and accordingly also the supply. Although prices remained high until 1985, Surinamese bauxite production and export value plummeted. In 1986 prices were 20 % lower than the 1980 level (see Annex A, Table 1), due to numerous price declines in this period resulting from a world economic recession. In addition to this, due to severe human rights violations by the military regime in Suriname, the Dutch government decided to cease aid to the country, immediately effective in 1983.

Table III:2 – Development Aid, Resource Rents and Public Expenditures

	Official Dev. Aid	Publ. In-vestment	Publ. con-sumption	Baux. revenues Gov.	Net Int. reserves	M2	Fiscal deficit
1970	42.1	31.5	118.7	44.3	85.7	146.3	-42.5
1971	34.6	28.4	130.2	52.1	84.0	166.1	-35.8
1972	44.1	33.9	133.2	51.2	101.7	187.7	-35
1973	33.5	41.0	148.6	47.2	131.8	228.8	-56.4
1974	57.1	43.0	159.6	135.1	143.9	245.4	-47.9
1975	79.2	79.0	208.0	98.6	205.7	292.2	-70.4
1976	159.2	136.7	261.8	100.2	242.5	398.2	-150
1977	138.4	153.8	333.7	123.6	211.4	473.6	-201.4
1978	98.9	145.2	345.1	151.7	277.6	549.1	-121.8
1979	144.0	132.0	362.5	149.9	331.2	613.4	-124.1
1980	131.5	128.5	338.5	173.4	383.4	659.9	-107.5
1981	169.0	175.5	430.7	150.8	412.1	788.8	-225.6
1982	172.9	189.0	543.0	109.8	334.8	876.1	-271.8
1983	0.0	114.0	586.0	102.1	162.8	971.7	-313.2
1984	2.1	83.0	558.0	83.6	61.4	1,168.9	-311.5
1985	2.4	55.0	604.0	61.1	52.1	1,544.2	-371.8
1986	4.9	39.0	736.0	33.1	31.7	1,936.1	-461.5

Source: Source: report "Een belaste relatie" (Kruijt and Maks; 2003) ; Database I. San A Jong; Summary Accounts: Banking System from the Central Bank of Suriname

Unlike public investments, consumption expenditures did not decrease (see Table III.2). From 1980 onwards development aid would frequently be used as a political instrument by the Dutch government in the relationship with Suriname. Military regimes, or administrations associated to elements of the former military regime were not or scarcely supplied with Dutch development aid in this period. Nevertheless inflation was tamed due to the international reserves that sustained the exchange rate level for some years. This can also be a signal of Dutch Disease.

During 1984, foreign exchange reserves depleted rapidly (partly as a result of ODA decline) but the government did not dampen public consumption expenditures. Instead, a complex license-intensive system of import contingency was introduced with the initial purpose to control the foreign exchange flows in the economy. At the same time a number of (protected) import substituting and resource based industries were promoted and established by the government. Many were not sustainable, mainly due to their production processes that were significantly dependent on scarce foreign exchange. Moreover, the protective environment in

which they operated did not provide the incentive to innovate and to adopt an outward – looking (export) orientation.

The fiscal deficit increased quickly and was monetized (M2 increasing accordingly see Table III.2), mainly because external financing of the budget from ODA and current bauxite revenues (due to unfavourable commodity prices) were lacking or to low. Because excess money in the economy (increasing M2) had no leakage (due to the lack of foreign exchange and import contingency) and the lack of domestic supply, the price level started to inflate in 1985 (Figure III.3). Prices rose by 10.9 % in 1985 up from 3.7 % in the previous year. A dualistic market emerges, namely an official and parallel market both for goods and foreign exchange. Gross domestic product deteriorates further during this period.

The sharply diminishing commodity prices and hence the fall in government revenues from the mineral sector, together with the plummeted aid flows made some features of Dutch Disease transparent in this period. Public consumption did not adjust accordingly and exchange rates remained on an unsustainable level (Annex B, table 4). Public consumption and hence budget deficits were monetized by the Central Bank, causing rapid increase of money supply and money in the economy. As mentioned by van Dijck et al (2000) the unexpected high commodity price hikes in the previous period distorted the economy in such a way that the real exchange rate (RER) appreciated steadily from SFL 1.297 per US$ in 1983 to SFL 0.834 per US$ in 1986. This further hampered the competitiveness of especially the import substituting infant industries which were also very reliant on scarce foreign exchange.

The introduction of an import contingency system combined with the establishment of a heavily subsidized, uncompetitive and protected inward oriented, import substituting and resource base (infant) industrial sector, whether or not intended, characterizes this period to be one of the less open trade periods in the country's post-independency existence. To illustrate this within the model in Chapter V, a trade-openness dummy will be included.

1987-1991: Back to parliamentary democracy, aid, favourable commodity prices and civil war

In 1987 elections were held after seven years of military rule. A year before a devastating civil war emerged in the interior, damaging some important production structures (e.g. palm oil industry,) and physical infrastructure (e.g. roads and bridges, electricity generating structures).

After bauxite and bauxite derivatives prices had hit the bottom in 1985-1986, gradual increases occur in 1987. Export revenues jump from SFL 444.2 million in 1987 to SFL 543.2 in 1988, registering an almost SFL 100 million increase. But due to the war ravaged production infrastructure, production fell and remained on a low level for some years to follow. To capture the effects of this war and some war-situation-like features (contra-coups, military junta administrations, political arrests etc.) during the years of military rule, a war-dummy variable will be included in the growth equation.
Remarkable for this period is the fact that bauxite exports as a raw material came to an end in 1987. Subsequently, all mined bauxite was refined to alumina.

In this period the Dutch government decided to gradually restart the development cooperation process with Suriname. The widely applauded reinstatement of parliamentary democracy that followed after the 1987 elections gradually revived the development cooperation between the Netherlands and Suriname, but did not prevent the aid disbursements to be on their lowest levels since 1970. According to Kruijt and Maks (2004) the Dutch government failed to capitalize on the opportunity of supporting the democratic movement at that time. A lot of time (4 years) was wasted due to bureaucracy. In this period ODA amounted on average a mere 1% of GDP coming from around 4 % in the previous period (1980-1986). Additionally capital expenditures increased.

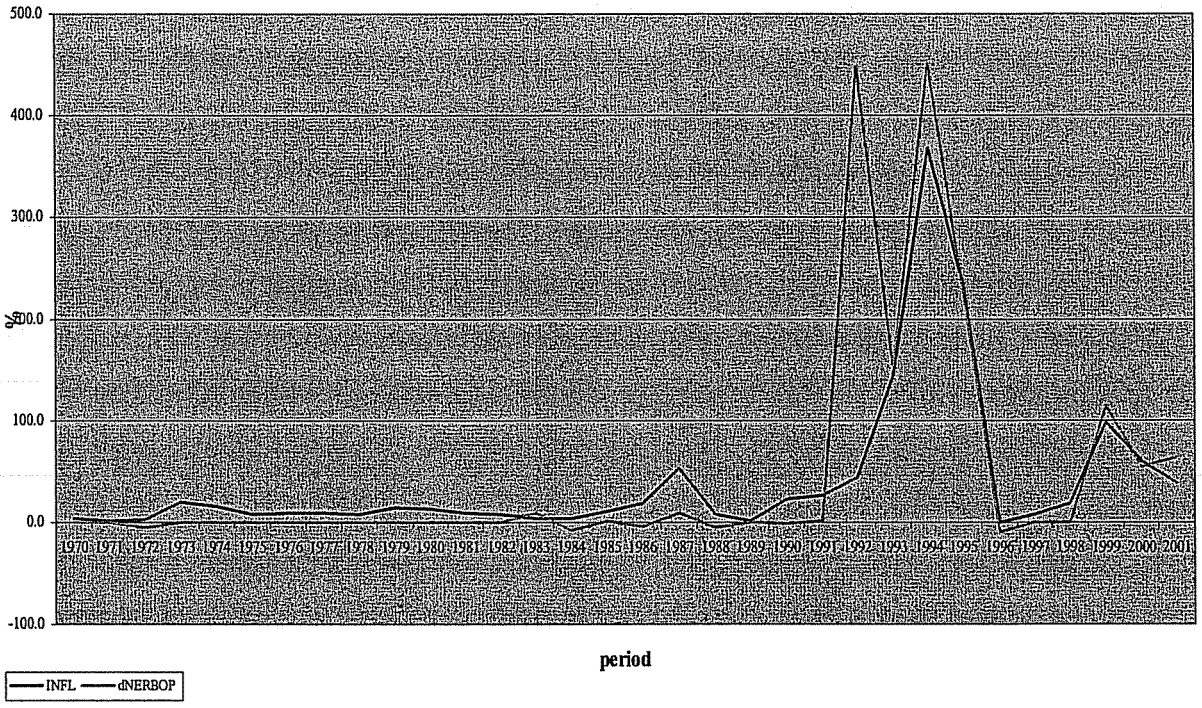
After a so called telephone *coup d'etat* in 1990 the Dutch government again degraded the development assistance to a lower level in the subsequent years. Output growth picked up again in this period, except in 1990; probably due to a fall in bauxite revenues and war hampered production structures and activities. In 1991 new elections were held.

1992-1996: End of the civil war, structural adjustment and economic stability

The newly elected government signs a peace treaty with the rebels, ending a period of devastation. The same administration implements a structural adjustment program (SAP) without any interference of the IMF. A substantial amount of ODA would be allocated to the SAP in the form of for instance balance of payments support. The conditions linked to this support were not met (such as floating the exchange rate) leading to its withdrawal. The grants for a social safety net remained.

The economic restructuring brought a dramatic end to a period of overvaluation of exchange rates and other misalignments in the economy, at a high social cost. As a result high inflation (Figure III.3) decimated real incomes and social transfers. Remittances (money and food parcels) from family in the Netherlands were the main compensation for the decimated incomes and social transfers (ten Berge; 1991). Combined with (again) falling commodity prices, government revenues weakened further.

Figure III:3 – Inflation Rate and Nominal Exchange Rate Change



Source: Author's Calculations

However, monetary overhang and fiscal deficits were gradually reduced due to contractionary fiscal and monetary measures as part of the SAP[18]. Output growth still languished. Noteworthy is the fact that in 1994 the multiple exchange rate system was unified. This resulted in an average nominal exchange rate depreciation of 254.1 % in this period.

An upswing in commodity prices and increasing aid disbursements seemingly triggered GDP growth in this period. Inflation plummeted from 235.6 % in 1995 to -0.7 % in 1996 mainly triggered by a severe demonetization of the economy. In 1995 the liquidity ratio was 29 %, descending from 43.5 % in 1992. Remarkable in this period are the measures to further liberalize the current account of the balance of payments (trade) and the new membership of Suriname in the regional trade community and WTO.

The above was another reason for the sharp decrease of inflation since the implementation of these significant trade openness measures and at the same time the abolishment of a great part of the import contingency system of the 1980's provided the monetary overhang a leakage out of the domestic system through imports.

In 1995 the economy was stabilized as an outcome of the contractionary monetary and fiscal measures and the coincidence of rising alumina prices. The first fiscal surplus in more than ten years was achieved.

With the elections in 1996 came large aid inflows which are reflected in substantial public consumptive- and capital spending such as low quality road re-pavement projects with the purpose (according to some) to keep the incumbent administration in office. This coincides with Torvik's (2004, p. 20) discussion on the soft budget constraint that *"...policy is too short-sighted as politicians discount the future return on projects by the probability that they remain in power..."*

Unfortunately, the SAP had damage people's confidence in the serving administration. The positive outcome of the elections for the incumbent administration was not robust enough to establish a coalition. Again, an administration was established with links to former military rulers.

[18] M2/GDP went from 87.5 % in 1991 to 44.6 % in 1994, while total fiscal budget/GDP went from -17.3 in 1991 to -2.8 in 1994.

1997-2001: Political and social eruptions, capital expenditures, increasing fiscal deficits and commodity prices

Upset by the radical salary and labour reform measures implemented by the new government and several fiscal and monetary expansionary measures, labour unions (support by the political opposition) began a long series of strikes and street riots. In addition a new downward spiral of commodity prices emerged in this period. Alumina prices for instance were 16 % lower in 1999 compared to 1997. Real output growth that amounted 5 % in 1997, went down to -7 % in 1999. Other commodity prices such as prices for agricultural exports (e.g. rice, banana and shrimp) also weakened in this period.

Aid disbursements again dropped from an average of 12 % of GDP in the previous period (1992-1996) to 3 % of GDP in this period (Table III.1). Note that in some of the years, economic growth was negative.

Huge infrastructural works were financed by capital expenditures and mineral rents in 1999. In the absence of significant aid flows some of these capital expenditures were externally financed (e.g. loans) or by allowing budget deficits. In one such a case around US$ 80 million from future bauxite revenues of the government was allocated for the construction of two bridges in the route through the coastal area of the country. This will be stressed further in the section on the MSF.

The political and social unrest ultimately led to premature elections in 2000 (instead of 2001), with a convincing victory for the former opposition parties.

This overview clearly indicates the dependence of the country on mineral resource exports namely bauxite and development aid. However, it is remarkable that aid flows to the country diminished to a significantly low level during the three described decades. The cause of this ranges from political reasons (e.g. boycott of military or former military regimes linked administrations) to government capacity constraint[19] to design appropriate projects or programs that needed ODA financing, or the failing mode of assistance that needs to be reformed. Recently both governments agree to shift towards sector-wide project financing (the so called SWAP) (San A Jong; 2003).

[19] This capacity limitation is a direct result of "brain drain" and unattractive public sector payment systems for highly skilled professionals

With respect to natural resource exports it is noteworthy that the importance of other mineral resources like crude oil and gold grew in the last two periods. Alluvial gold mining was and still is a largely informal activity with many linkages to communities in the interior (e.g. households of the workers, local businesses) and in the city (e.g. suppliers of gold mining equipment, jewellery shops).

It is believed that increasing revenues from the non-traditional sectors compensate for the decline in ODA flows in the last decade.

From the above historical analysis it goes without saying that ODA and bauxite exports had a significant role in the country's economic development in the period 1970-2001. Whether the relationship was direct or indirect or both, is unknown and will be investigated by the use of country data and data analysis techniques in the following chapters.

CHAPTER IV EMPIRICAL DEVELOPMENTS OF RELEVANT INDICATORS

IV.1 Introduction

A substantial number of studies (like Hjertholm et al (1998), Adam and Bevan (2003), Vos (1994) and White (1992)) and empirical evidence describe the negative relationship between aid and economic growth, which implies a rethinking and reformulation of conventional aid policies and practises, at the same time others also show that the aid growth relationship can be positive for instance in poorest countries (Szirmai (2004), McGillivray (1999)).

Following the theories and hypotheses stated in Hansen and Tarp's (HT) (2001) study on the relationship between aid and growth, and the empirical discussions in chapter III, a negative relationship in the case of Suriname is assumed, based on the allocation of aid resources and at the same time poor economic growth performances during the described period. HT mention the effect of aid on growth via capital accumulation and the non-linear approach of this relationship (aid-growth) that proved the importance of the presence of a good policy environment for aid to succeed. However it is not clearly explained what is meant by good policy environment. In this study these approaches will be simplified, due to a lack of time, space and data on policy variables for Suriname[20]. Therefore, besides the direct economic impact of official development aid on growth, some indirect channels, however not exhaustively, will also be explored in a model for Suriname.

The natural resource-growth analysis will focus slightly on Sachs and Warner's (1997) (SW) cross-country growth equation and Boschini et al's (2003) study. In the growth regression equations, a few proxies for natural resource dependence, among others the ratios of bauxite sector export receipts to GDP, bauxite exports to total exports will be included. In their study SW used the following equation:

$$ln(y(T)/y(0))/T = \alpha_0 + \alpha_1 ln(y(0)) + \alpha_2 Z + \epsilon$$

[20] A policy equation like in Hansen and Tarp (2001) could not be formulated.

(1) Policy = α + β* Budget surplus - λ*Inflation + γ*Openness

Here Z is a vector of economic characteristics which determine growth. This can include among others measures of natural resource. The preferred measure of resource dependence in SW is the ratio of primary-product exports to GDP. In this study as said before bauxite and total exports revenues will be used as a measure of natural resource dependence, since these exports are by far the most important in the Surinamese economy (see Table I.1).

IV.2 Data Analysis

IV.2.1 Data Sources

The availability of reliable and consistent data for this analysis was poor. Secondary data was used from:

- World Development Indicators Database of the World Bank;
- IMF-International Financial Statistics and Article IV consultation mission reports for Suriname; The IMF Article IV mission data was compiled by Imro San A Jong, former consultant with the UNDP;
- Central Bank of Suriname Macro-model data;

The secondary data used in this analysis was collected for the main part by Imro San A Jong (2003), former consultant with the UNDP in Suriname. The data was retrieved from IMF Article IV consultation mission reports on Suriname, annual reports of the Central Bank of Suriname, yearbooks of the General Bureau of Statistics. Most external and fiscal sector data series were retrieved from the Central Bank of Suriname Model (CBMOD2) database. The data presented in the tables within the text are calculated from actual nominal figures to give the reader an idea of the magnitude of the indicators, where as for analytical purposes (figures, growth calculations etcetera) real data is used.

The variables and their time-series that will be used in the regressions are in Annex B, Table 4. Real values of all the variables were used, since the nominal values are in many instances distorted by price and exchange rate fluctuations. To obtain the real values of the variables, the nominal values were deflated by a GDP deflator. But note that even this GDP deflator is not very accurate. In some years there still are significant price effects inflating the real data.

Annex B, Table 6 reveals that the time series have 32 observations for all variables in the analysis, which can be considered reasonable. The variable PCRGDP has a minimum value of SFL 2839,- and a maximum value of SFL 4768,-. It is notable (and that is for all variables) that due to large fluctuations in exchange rates, prices and deflators the quality of the data is not of the highest. This large gap between the minimum and maximum value, also determines the magnitude (size) of the standard deviation, which illustrates the deviation from the mean or the precision. The mean PCRGDP for the period 1970-2001 is SFL 3635,21.

The rest of the descriptive statistics can be read from this table.

IV.3 Empirical Evidence Of The Aid/Growth And Natural Resource/Growth Transmission Channel In Suriname

IV.3.1 Introduction

Beside the theories, data and empirical patterns were used as guidelines to explain key economic relationships. Prior to running the regressions of the different variables in an equation, it was interesting to observe different patterns of correlations between some of these economic variables.

IV.3.2 Development Assistance And Economic Growth

Success or failure of aid depends on the transmission or processing capabilities of the country and the objectives of the donor entity to distribute aid resources in a way that facilitate growth. These issues relate to the different features of aid such as aid effectiveness, conditionalities and ownership which will not be discussed in this paper.

In the case of Suriname, ODA had been through several transformations in the six distinguished periods. Some were more successful than others in meeting the objectives. After 1975, the country's independence, aid allocation was in the form of project aid, frequently with soft conditionalities.

It is noteworthy, that the development cooperation was on a bilateral base. This strategy was sustained after 1975, when the DFL 4 billion plus development treaty was geared towards implementing the multi-annual development program. After a new treaty[21] was signed in 1991 the modality changed somewhat allowing a third party, in this case the European Community, to supervise a specific part of the cooperation[22].

Official development aid gradually decreased in the past decades since independence. The following table illustrates that it fell from 9.5 % of GDP in the 1975-1979 bracket to 4.0 % in the next bracket. The absolute minimum level of ODA was in the period 1987-1991, the first parliamentary democracy era after military rule from 1980-1986.

Table IV:1 – Official Development Aid (in % of GDP)

	1970-1974	1975-1979	1980-1986	1987-1991	1992-1996	1997-2001
ODA	6.5	9.5	4.0	0.8	11.7	2.9

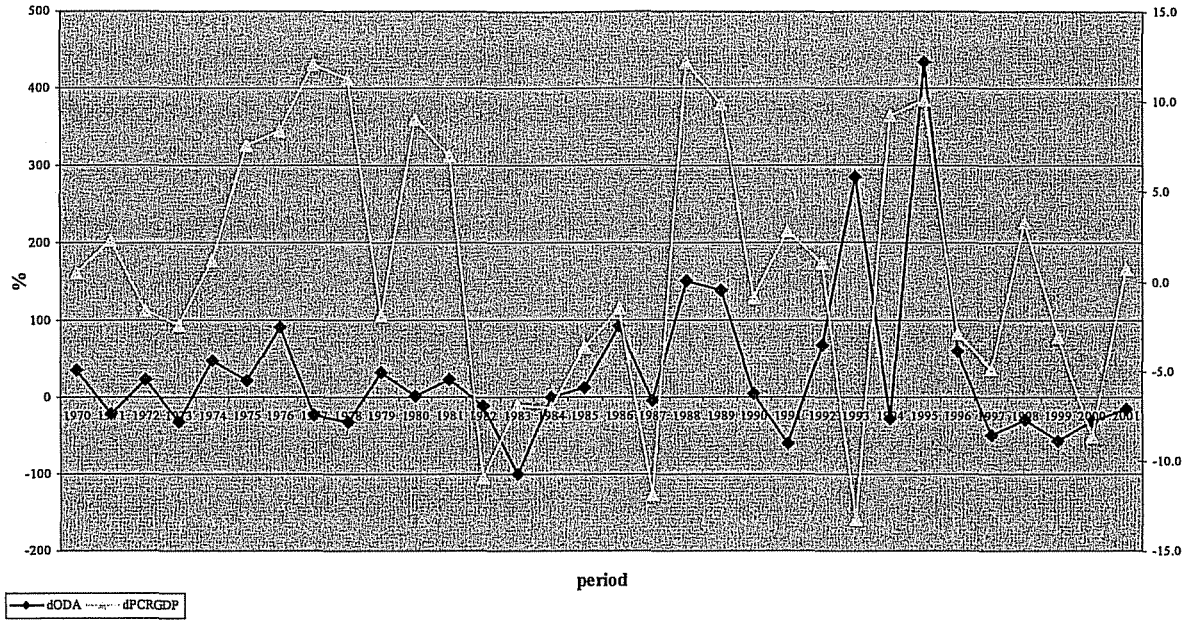
Source: Central Bank of Suriname Annual Report 1957-1982; From D. Kruijt and M. Maks "Een belaste relatie"

When linking aid flows to economic growth, the different distinguished periods show different patterns (Figure IV.1). As for economic growth, the annual change in real per capita GDP will be used as a proxy[23].

The patterns in the figure clearly show that pre-independence ODA flows (1970-1974) where negatively correlated with growth. Earlier assessments of the development cooperation between the Netherlands and Suriname reveal how ineffective the assistance was before and after the independence. Some implemented projects were only to keep the peace between the different ethnic groups in the country but at the same time did not have economic growth or sustainable development incentive at all.

[21] the so called *Raamverdrag*
[22] Balance of payment support from Dutch development assistance during the SAP was supervised by the European Community
[23] Using Sachs' and Warners' (1999) measure of growth

Figure IV:1 – Annual Change of ODA and Per Capita Real GDP



Source: Author'Calculations

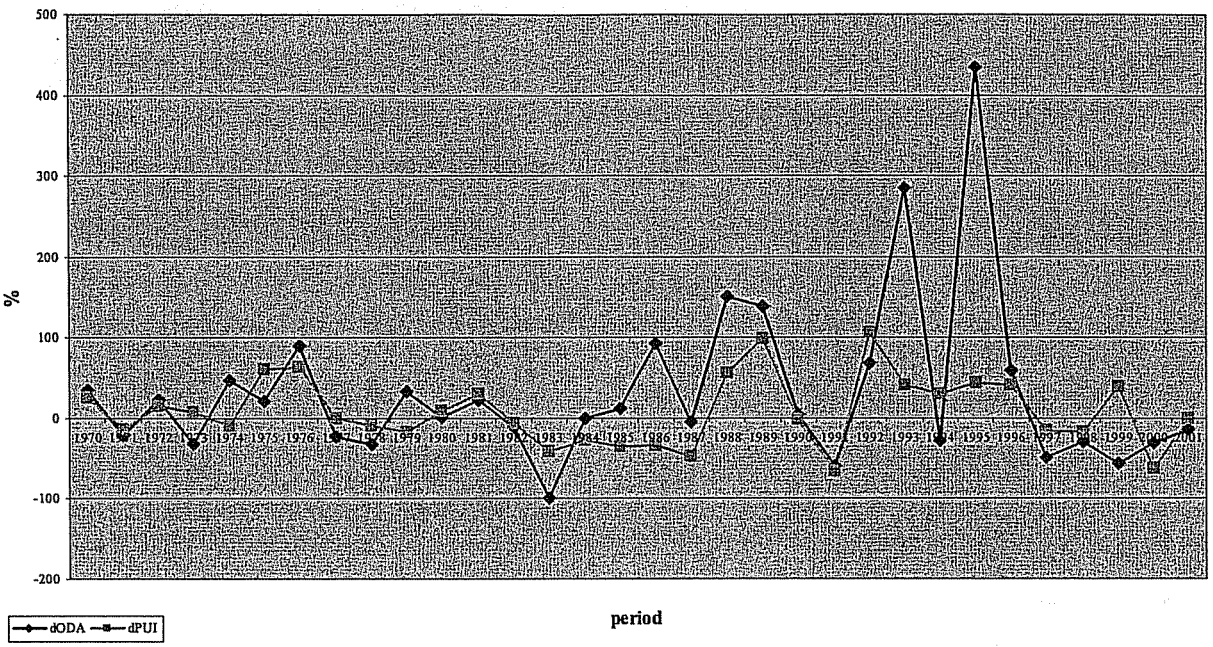
After 1986, development assistance and income move with the same pattern. Diminishing revenues, due to plummeting alumina prices were somehow compensated for by the gradually increasing inflows of Dutch Treaty Aid after the elections in 1987. Throughout the whole period 1970-2001, on average there seems to be a positive relationship between ODA and per capita gross domestic product. Given that ODA is completely absorbed by the public sector, two elements namely public consumption and public investment are the most likely to be the channels through which aid can stimulate activities that affect economic growth.

However, the above seems somehow to be more valid for public investments as public consumption was mainly financed otherwise (bauxite revenues or monetary financing).

IV.3.3 The ODA And Public Investments Channel

Annex A, Table 2 illustrates that the majority of ODA funds went to public investments. The underlying Figure IV.2 gives an idea about how ODA and public investments were related in the period 1970-2001.

Figure IV:2 – Change in Public Investments related to ODA Change



Source: Author's Calculations

Yet in periods were ODA was on a very low level, public investments moved accordingly. When government revenue plummeted after the alumina price drops in the first half of the 80's combined with the stop of ODA flows, public consumptions (e.g. wages and salaries) remained unchanged, while significant budget cuts were introduced in public investments. It ultimately resulted in huge backlogs in physical infrastructure maintenance, in view of the fact that public investments were mainly in physical infrastructure.

As ODA increases from an average of 6.5 % of GDP in 1970-1974 to 9.5 % in 1975-1979, public investments moved along from 5.5 % of GDP to 10 % of GDP respectively. The drops thereafter were equivalent. It is remarkable though, that public investments did not sharply increased from 1987-1991 (1.9 % of GDP) to 1992-1996 (4.8 %), while ODA did (from 0.8% of GDP to 11.7%). This can partly be explained by the fact that during the SAP in the 1992-1996 a significant fraction of ODA was mainly allocated towards other activities than infrastructure. According to Kruijt and Maks (2003) this was about DFL 1 billion.

Table IV:2 – Official Development Aid and Public Investments (in % of GDP)

	1970-1974	1975-1979	1980-1986	1987-1991	1992-1996	1997-2001
ODA	6.5	9.5	4.0	0.8	11.7	2.9
Public Inv.	5.5	10.0	6.4	1.9	4.8	3.4

Source: Central Bank of Suriname Annual Report 1957-1982; From D. Kruijt and M. Maks "Een belaste relatie"

In the time bracket 1997-2001, ODA declined sharply to 2.9 % of GDP, from 11.7 % in the previous period. After some political scrimmages, the Dutch government reduced the development cooperation for the third time in 15 years. That affected public investments somehow, but that effect was mitigated after the ruling administration decided to execute some major infrastructural works. Public investments decreased only by 0.5 % percentage points from 4.8 % of GDP in 1992-1996 to 3.4 % in 1997-2001. These works were financed, as earlier mentioned, by future bauxite revenues, external loans and Central Bank loans to the government.

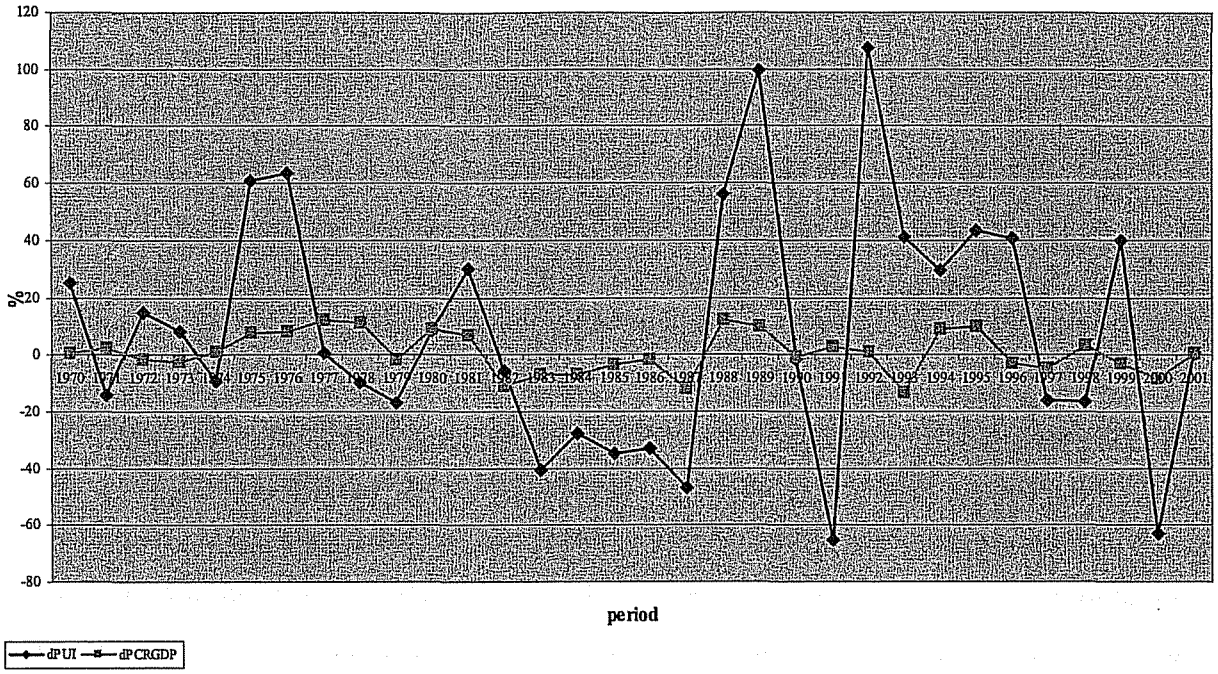
The above section leads to the cautious conclusion, that public investment was a significant channel for ODA to affect economic growth. But did public investments really affected economic growth and was that impact negative or positive?

IV.3.3.1 Public Investments And Economic Growth Channel

Public sector investments in infrastructure are believed to foster economic growth in case (export) production zones are made accessible or been established (Hjertholm et al; 1998). For Suriname this was by far the case since the majority of infrastructural works was mainly focussed towards the maintenance of existing roads and bridges and not towards the construction of new roads. Let aside the fact that there has been no significant expansion of the country's production infrastructure[24] after its independency. The next figure illustrates the evolution of public investments and economic growth in real terms.

[24] Besides small scale crude oil exploration in the early 80's

Figure IV:3 – Investments Growth and Per capita Output Growth



Source: Author's Calculations

At a first glance the two figures exhibit no clear equivalence in their movements across the years, except maybe for the period 1978-1982. In this period the Surinamese government had committed itself to explore and exploit massive proven bauxite deposits in the South-western part of the country. For this project, called the West-Suriname project, substantial investments from ODA were used to construct new infrastructure. Beside employment, these investments gave a major push to total production and thus economic growth. But in 1981, the new military-civil government eventually halted investments in all mega projects, since they were regarded unmanageable and resource "guzzlers".

Even though this project stemmed from "the big push" (Gillis et al; 1992) idea to develop part of the hinterlands by industrialization around bauxite mining as the core activity, its sustainability remained a major concern. There concern was in line with the description of Paul Rosenstein-Rodan[25] of the coordination problem (Ros; 2003). In Suriname's case that coordination problem had to do with the fact that in order to setup a government owned bauxite sector, bridges, roads, railways and a hydropower plant was needed. Rosenstein-Rodan argues (and so did the administration back then) that each of the investments in these

[25] One of the proponents of "the balanced growth (on the demand side) approach" (Gillis et al; 1992)

infrastructures could serve a number of more manageable (smaller) factories. The administration did not favour the big-push approach.

Even from the Dutch side there were critics that doubted the feasibility and profitability of this project, as Suriname lacked the in-house expertise and skills to run such an operation alone, after it bought of the joint-venture agreement with the American multi-national Reynolds in 1974. At the end the massive public investments that took place with respect to this project just caused a temporary boom in total production (1978-1982), but did not create a source of sustainable growth.

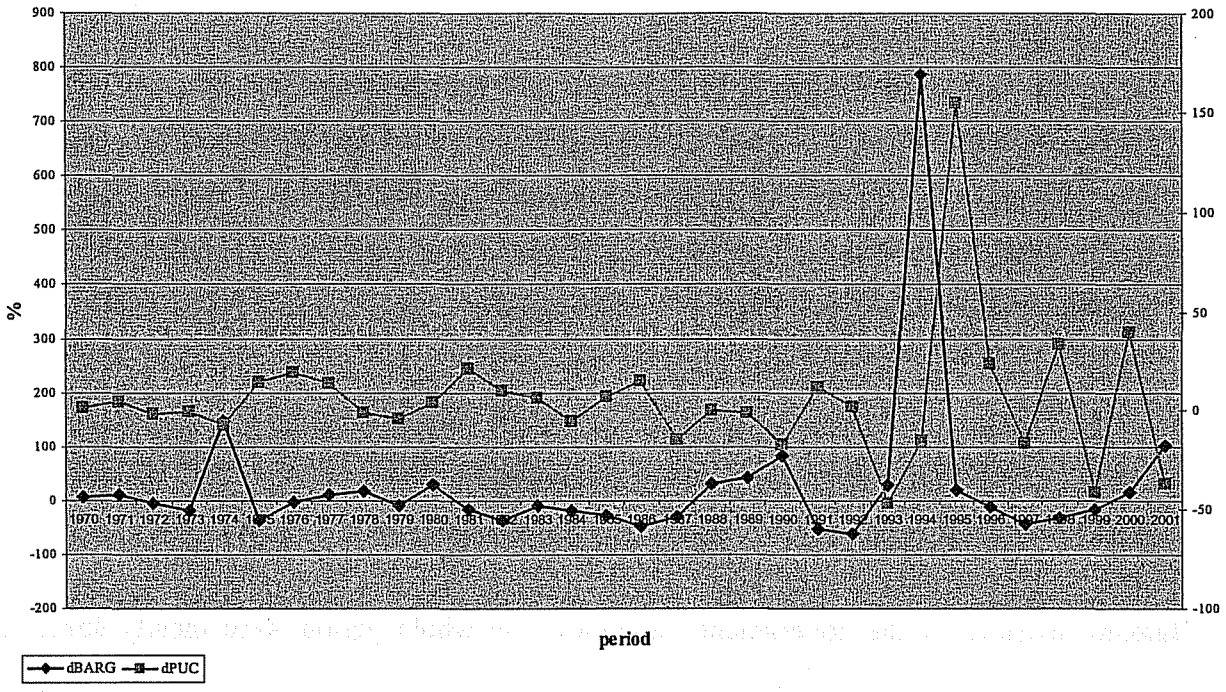
IV.3.4 Revenues of the Government: Public Consumption, Transfers and Subsidies and the Resource Rent Indicator

Bauxite revenues of the government throughout the whole period were mostly spent for public consumptive purposes. A significant share of public sector salaries and material costs are covered by these transfers.

Real public sector consumptive spending went up on average by 8 % between 1975 and 1979 compared to the 1 % decline in 1970-1974, while government revenues from bauxite exports fell by an average of 4 % in 1975-1979 compared to staggering 29 % increase in 1970-1974, especially due to the introduction of the bauxite levy in 1974 (see Annex A, Table 3).

In 1975-1979 the substantial difference between current bauxite revenues and public current spending was covered by substantial ODA inflows as an outcome of the post-independence development cooperation treaty.

Figure IV:4 – Bauxite Revenues of the Government and Public Consumption



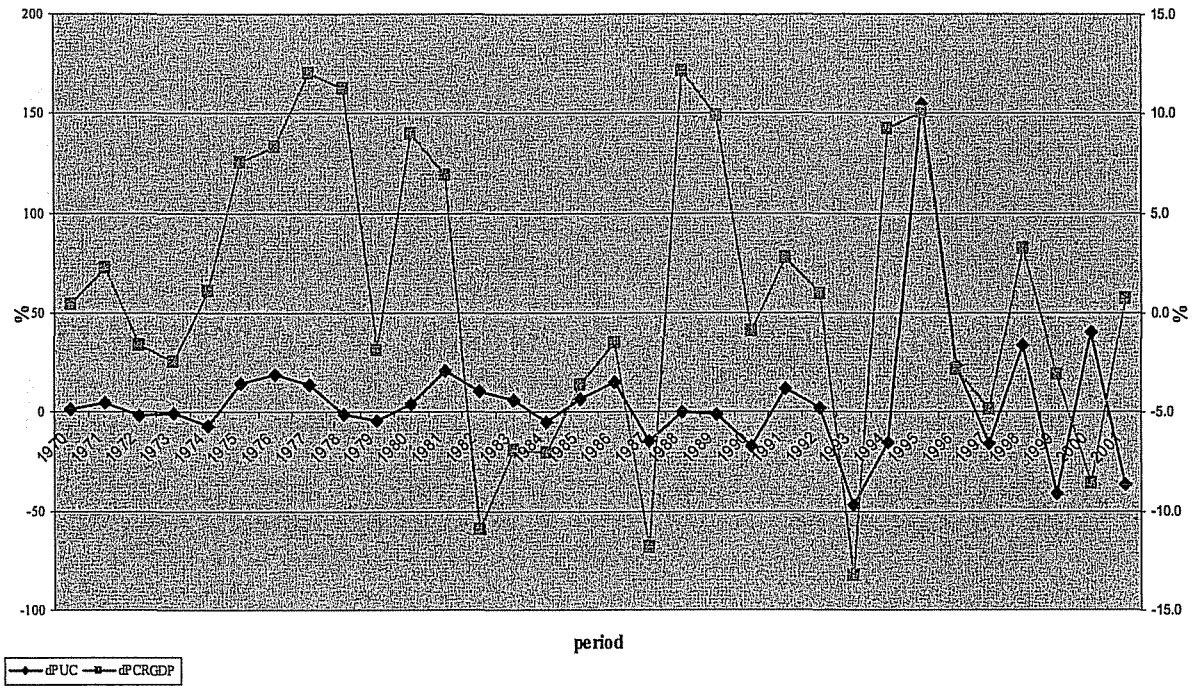
Source: Author's Calculations

In investigating the link between public consumption and economic growth, it is clear that rising salaries and material costs of the government, increases the share of government value added in total production. The relationship can therefore be assumed positive (Figure IV.5), as during the whole period under study government grew larger and became the biggest employer in the country.

Mentioned earlier in the theoretical review, these revenues are also labelled resource rents and were very important in the period 1980-1986, after ODA was halted and after the aluminium price downfall. These rents were used to finance transfers and subsidies which comprised of social transfers (e.g. pensions, public health insurance) and subsidies (e.g. to public sector owned companies)[26].

[26] In the next chapter this indicator will be included in the regression analysis.

Figure IV:5 – Public Consumption Growth Related to Per Capita Output Growth



Source: Author's Calculations

A remarkable period with regard to the allocation of rents was 1997-2001. The administration decided to build two large bridges across two major rivers in Suriname, together costing approximately US$ 100 million. The government decided to finance this project with future bauxite revenues of the government, meaning that the bauxite companies would directly deposited their transfers to the government on an account of Ballast Needam, the bridge builder, abroad. It is widely acknowledges that these bridges, although not embedded in a comprehensive region development strategy, are crucial in stimulating future production in former relatively isolated areas of the countries and enhancing efficiency in transportation, travel (tourism) and commerce (e.g. banana production in the Northwest). And hence stimulate economic growth. Unfortunately, this modality had a high cost. Current expenditures of the government suddenly lost a fundamental source of financing. Therefore budget deficits accelerated, while simultaneously ODA flows were dropping.

But was it possible to allocate these rents for that purpose in a different way? If earlier governments had decided to structurally preserve a fraction of bauxite and other[27] minerals rents in a stabilisation fund abroad it is highly likely that a number of infrastructural works or

[27] Mind the growing importance in the later 80's and thereafter of crude oil exports and gold production

government financial needs in periods of unstable revenues from mineral exports, could be financed without distortions to the economy as a whole.

Assume that 10 % of nominal bauxite revenues in US dollars would be allocated by law to a MSF since the introduction of the bauxite levy in 1974. Table IV.3 illustrates how much funds would have been reserved hypothetically between 1974 and 2001. Excluded are interest revenues on the funds, inflation corrections and revenues from other minerals.

Table IV:3 – Preserved Bauxite Rents (in millions of US$)

	1974-1979	1980-1986	1987-1991	1992-1996	1997-2001	Total
MSFUS$	7.1	5.6	3.5	2.5	2.7	125.4

Source: Author's Calculations

The conservatively estimated US$ 125.4 million may not seem substantial, but in the course of 27 years it could have prevent the economy from going through several painful adjustments and even strengthen the economic structure if funds would have been allocated for export promotion and export diversification.

IV.3.5 Real Exchange Rate Channel And Economic Growth

In the 80's the real exchange rate was gaining strength (appreciating) even though the foundation for that strength was depleted, namely the foreign exchange inflows from both ODA and bauxite exports. The coordinated efforts of that government were geared towards keeping the exchange rate on an unsustainable high level and pursuing import substituting and foreign exchange savings policies. But imports became cheaper, while the export sector, especially the agriculture sector, saw its earnings in local currency terms diminishing.

Table IV:4 – Real Exchange Rate Change and Growth of Output

	1970-1974	1975-1979	1980-1986	1987-1991	1992-1996	1997-2001
RER	-0.9	-1.3	-5.5	-13.5	60.6	1.2
PCRGDP	0.0	7.5	-2.0	2.4	0.8	-2.5

Source: Author's Calculations

Note that a positive sign implies depreciation, while a negative sign means appreciation. The above table demonstrates the changes in the real exchange rate in the different periods. Eye balling the data does not reveal any definitive relationship between real exchange rate and per capita GDP growth, but it shows that once the exchange rate was significantly appreciated in the period 1987-1991, GDP starts to grow positively. The appreciation in this period was remarkable because:

1. ODA flows and bauxite revenues were increasing due to on one hand the restart of the development cooperation (ODA flows on average grew by 72 % in 1987-1990) between Suriname and the Netherlands after democratic elections in 1987 and on the other hand rising aluminium prices (real prices rose on average by almost 20 % between 1987-1990).
2. There was enough incentive to appreciate the real exchange rate since foreign exchange reserves increased.

Prices were kept low due to downward pressures on the real exchange rates. Table IV.4 illustrates that however the appreciation in 1987-1991 was (13.5 %) price increases could not be prevented, because a significant share of goods and services and foreign exchange transactions took place on the parallel market with higher than official-economy exchange rates.

However in general, the real exchange rate had widespread impact on several macroeconomic indicators like inflation, exports, imports, investments and savings. Especially during the SAP years 1992-1996, when real exchange rates on average depreciated by almost 61 %, resulting in enormous price increases with devastative affects for the non-mineral, domestic production sectors. While exporters were compelled to surrender foreign exchange earnings, prices for domestic inputs and cost of production factors went up drastically.

This put a break on average per capita GDP growth that went down from 2.4 % in 1987-1991 to 0.8 % in 1992-1996.

It is worth mentioning that according to San A Jong (2003), the data on Gross Fixed Capital Formation has suffered *"from serious deficiencies"* (p. 35). This was due to:

- a high rate of low or non-response with respect to investment surveys;
- Under-recording.

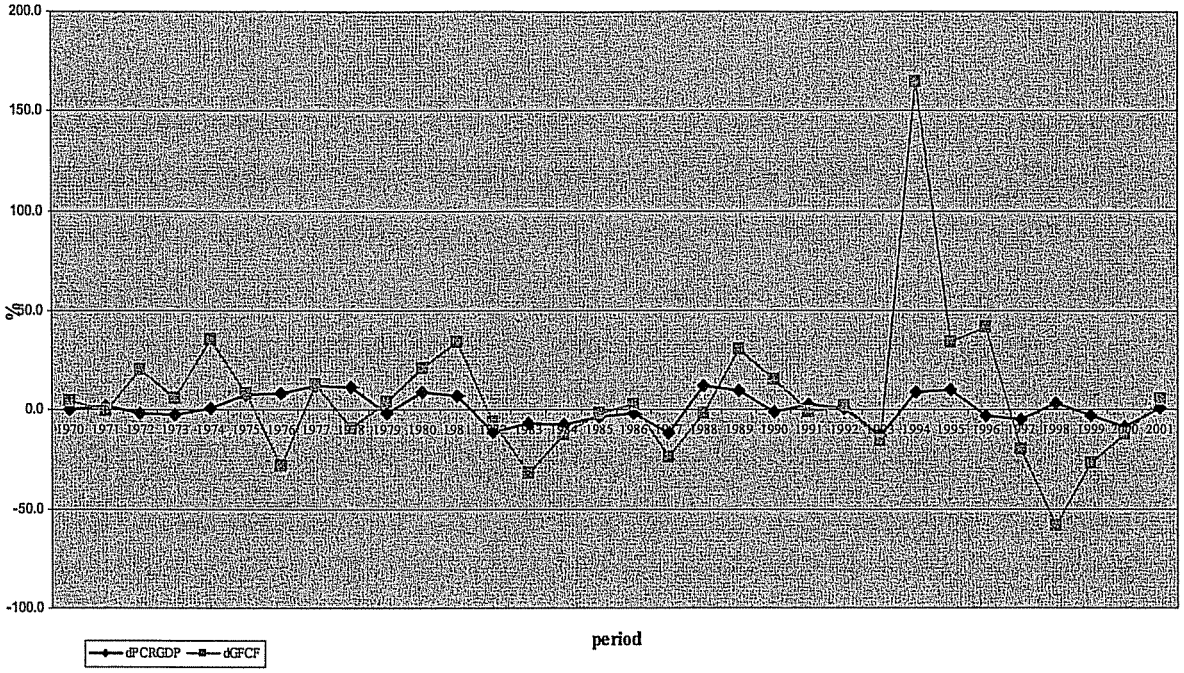
This variable is therefore used with some caution.

Gross Fixed Capital Formation (GFCF) comprises of all capital formation in the form of land improvements, construction (production - and civil infrastructure like schools, hospitals etcetera) and valuables acquisition (WDI 2003).

Judging from its content, it is highly likely that GFCF has a positive and strong influence on economic growth. In some periods there seems to be a lagged relationship that will be investigated further econometrically.

However, at a first glance of Figure IV.6, it looks like there is no significant direct relationship between the two.

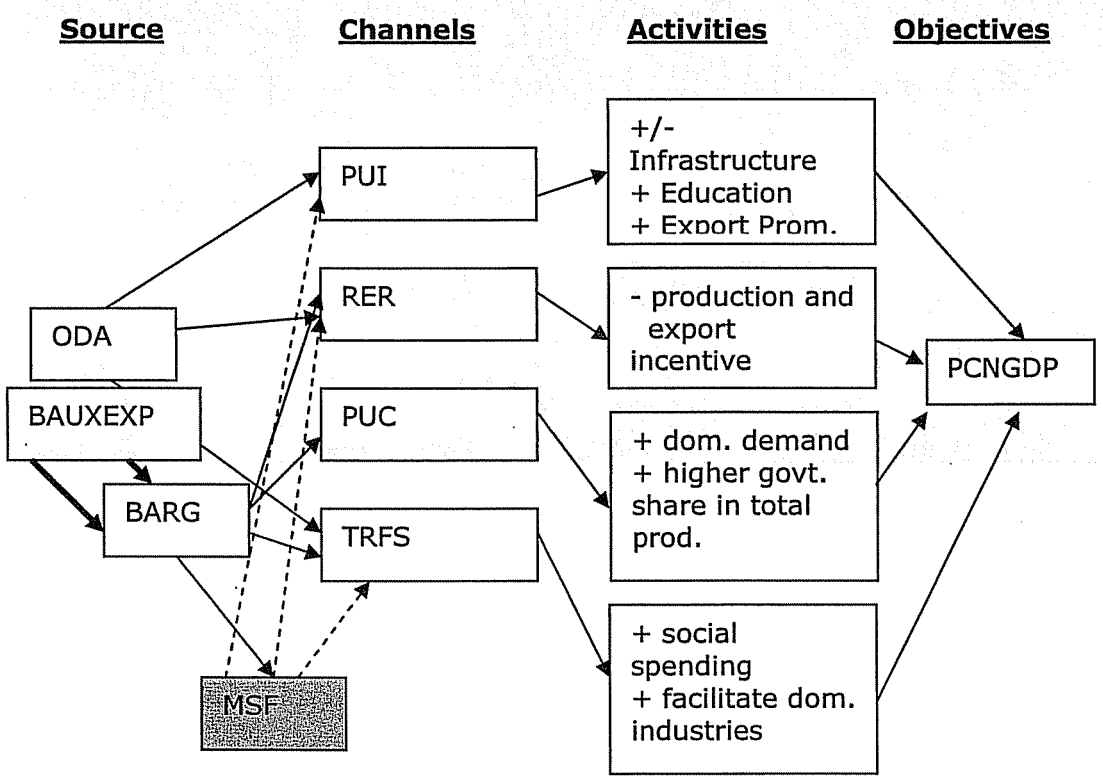
Figure IV:6 – Gross Fixed Capital Formation & Per Capita Output Growth



Source: Author's calculations

In summarizing the above, the different channels and relationships that were illustrated in this chapter can somehow be illustrated in the following diagram:

Diagram II:1 – Aid and Bauxite Exports Transmission Mechanism



Dotted lines: Recommended MSF allocations in the case of Suriname

Note: that the plus and minus signs indicate respectively positive and negative correlation. If both, then the relationship can be ambiguous. For variable names see Annex B: Table 2.

In the next chapter an econometric model will be specified and empirically tested, based on the above illustrated relationships and channels.

CHAPTER V SPECIFICATIONS OF A RESOURCE CURSE MODEL FOR SURINAME

V.1 Model Specification

V.1.1 Relevant Assumptions

Before specifying this simple model, it is opportune to describe the assumptions that are at the base of this model. It is assumed, that population growth remains constant throughout the entire analysis period, and thus movements in per capita growth are only caused by changes in the real GDP. In real live, population growth was on average very low and sometimes even negative[28]. Furthermore it is assumed, that the described relationships are linear of character. As a proxy for natural resource dependence, the ratio of bauxite exports to total exports is used, as this illustrates more clearly the economy's dependence on foreign exchange from bauxite exports revenues than on bauxite value added as a share of total production (Table I.1).

Another crucial assumption relates to the regression. Since the cointegration test revealed that all series are I(0) (therefore stationary), this analysis will focus on the long run and short run stability of the relationships between the variables.

Diagram 1 reveals the alleged relationships, while the directions of the arrows illustrate the causal direction.

The alleged relationships described in the previous sub-section strengthen the assumptions that aid and natural resource abundance can affect growth negatively. As such, it is assumed that the coefficients of ODA and BAUXEXPTEXP will have negative signs. The relationship between the real exchange rate and economic growth is said to be positive, hence the positive coefficient assumed.

That public investments will foster growth is commonly believed. Since almost all infrastructural investments come from public investments, the sign for this coefficient is

[28] Mid-Year population grew on average in the period 1970-2001 with 0.7 %.

assumed to be positive. The public consumption variable (PUC) will have a positive sign, because as mentioned before, civil servants wages and salaries and other public consumption of goods and services, enlarge the share of the government within GDP. But at the same time, higher public consumption tends to crowd out efficient and productive investments. So PUC can also have a negative impact on growth. It is assumed that gross fixed capital formation foster growth, but at the same time data analysis on this variable gives no clearance on this relationship. At last, government transfers and subsidies, if well spent, should foster higher per capita income. If not, then the same occurs as with PUC.

V.1.2 The Model

Since economic growth is measured here, the model will be estimated in log-log form[29], and thus the coefficients are elasticities.
Hence the base model is specified as follows:

$$(1)\ \log(pcrgdp_t) = \beta_0 - \beta_1 * \log(bauexptexp_t) - \beta_2 * \log(oda_t) + \beta_3 * \log(puc_t) + \beta_4 * \log(pui_t) + \beta_5 * \log(rer_t) + \beta_6 * \log(gfcf_t) - \beta_7 * \log(trfs_t) - ward_t + trod_t + \epsilon_t$$

pcrgdp = per capita real gross domestic product
bauexptexp = bauxite exports receipts as share of total exports
oda = official development aid (Dutch)
puc = public consumption
pui = public investments
rer = real exchange rate
gfcf = gross fixed capital formation
trfs = transfers
ward = dummy for war and military regime years
trod = dummy for Years Changes Trade Regime
ϵ = *error term*

[29] A logarithmic type model, with linear variables

V.2 Methodology

V.2.1 Ordinary Least Squares Method

This regression equation will be estimated with the OLS (Ordinary Least Squares) method, after the corresponding time series have been tested for unit roots or non-stationarity. The OLS method ensures that the coefficients are estimated in such a way, that the sum of squares of the error term is very small, resulting in a fairly accurate estimation of the dependent variable.

In the following section a cointegration test will be conducted and the results revealed for the residual.

V.2.2 Simultaneity Problem

In the previous chapter it was illustrated that some of the independent variables in equation 1 are correlated, which can lead to the simultaneity problem. For instance RER is assumed to have influences of ODA and BAUXEXPTEXP in it. Public investments are believed to be influenced by ODA throughout the entire study period. Of course the method used is a rather simplistic one, whereby causal relations are not exhaustively tested, and moreover correlations between just two or three series are used to explain transmission channels and to estimate error terms. But time- and data limitations did not allow for more sophisticated techniques (e.g. a 3 SLS method, instrumental variable estimations) to be used. To obtain a real exchange rate variable without influences from the two just mentioned variables, and to get a public investments variable without ODA influences, the following procedure will be done. First the equation is formulated for RER regressing it on ODA and BAUXEXPTEXP:

$$\log(rer_t) = \beta_1 - \beta_2 * \log(baux\exp t\exp_t) - \beta_3 * \log(oda_t)$$

Hereafter, a residual is estimated that captures all other influences on RER except the two variables included in the above equation. The residual obtained is labelled RESRER. The same is done with public investments:

$$\log(pui_t) = \alpha_1 + \alpha_2 * \log(oda_t)$$

The residual here is labelled RESPUI. The same procedure is applied to TRFS (transfers and subsidies) which are highly likely correlated to both bauxite export revenues and development aid flows, and to PUC (public consumption) which seems to be strong related to bauxite export revenues.

$$\log(trfs_t) = \delta_1 + \delta_2 * \log(baux \exp t \exp_t) + \delta_3 * \log(oda_t)$$

The residual is RESTRFS. For PUC the residual is called RESPUC.

The residuals were then tested for correlations among them. The results show that the error terms are not correlated among themselves (see Annex B, Table 4).

These residuals are then included into equation 1 and they respectively replace the variables RER, PUI, TRFS and PUC.

V.2.3 Cointegration And Autocorrelation Test

Economic variables frequently have unit roots (integrated of the order one or non-stationary), since time correlates them. In order to run sensible and stable regressions, time series should first be made stationary[30] or the residuals of the regression on levels should be cointegrated or I(0). After testing the residual of equation 1, the results reveal that it is I (0), thus cointegrated, while all the individual series were I(1) or non-stationary. This creates the opportunity to estimate equations on the levels of the real values. However, the choice was made to run log-log form regressions so that elasticities could be obtained that declare percentages change (growth) in the dependent variable caused by a one percent change in any independent variable.

The cointegration test was conducted on the residual, called RESREAL1 with the so called Augmented Dickey-Fuller test. The results are in the Table V.1.

[30] A common way to eliminate the non-stationarity in economic variables is by calculating first differences of these variables. Usually the first-differenced variables are stationary

Table V:1 – Augmented Dickey-Fuller Test (ADF) [lag = 0]

		Critical Values		
	Test-Statistic	1%	5%	10%
resreall	-3.070	-3.709	-2.983	-2.623

Source: Author's Calculations

The residual appears to be cointegrated for both the 5 % and 10 % critical level.

The just mentioned residual was also tested for autocorrelation, since non-stationary series can create non-stationary error terms, which can cause autocorrelation. The Breusch-Godfrey LM test (B-G LM) was applied to test on autocorrelation. If a residual is autocorrelated, a lagged (one or more lags) B-G LM test will be conducted of that residual until it is 'freed' of autocorrelation. Fortunately, this residual was non-autocorrelated of the order zero. These results are in Table V.2.

Table V:2 – Breusch-Godfrey LM Test (B-G) [lag = 0]

	Chi-square	df	5% Cr. Val.*
resreall	0.306	1	-3.34

*=From Wooldridge (2003, Table D.4, p. 969)
Source: Author's Calculations

V.3 Results

V.3.1 Preliminary Results

After conducting the cointegration tests, equation 1 was tested and the results are in Table V.3. The results reveal that public investments (t = 2.87) and transfers and subsidies (t = 3.12) are the only significant variables at a 95 % confidence level. All other explanatory variables seem insignificant in first instance. The R^2 of 0.7485 signals possible omitted variables bias and or simultaneity problems. Surprising is the insignificance of official development assistance and bauxite export to total exports ratio in this equation, although the latter has by far one of the largest magnitudes (coefficient = -0.182). The sign of it is negative, which is in line with the Resource Curse hypothesis while ODA has a positive sign which implicates that on average in the period 1970-2001, development assistance accommodated per capita

economic growth. But the insignificance of the two variables can be a result of the fact that their influence on growth was already captured by public consumption, real exchange rate, public investments and transfers. This will be investigated later. The RER has a negative impact on per capita GDP, which means that on average depreciations were not favourable for growth. This variable is in first instance also not significant. Public consumptions, gross fixed capital formation together with the two dummies for war and trade regime change years are also insignificant. Trade regime changes, although insignificant, seem not to have had positive influences on growth during 1970-2001.

V.3.2 Results After Simultaneity Problem Correction

After the simultaneity correction was conducted and the residuals of RER, PUC, PUI and TRFS were included in the equation 1, some drastic changes appear in the magnitude of all coefficients and their significance (equation 2). It is noteworthy that a general to specific system of regression equations will be tested. At the end one specific equation will be analysed completely as being the best equation to estimate the dependent variable on the basis of several diagnostic tests (e.g. t-values, F-statistic, Goodness of Fit)

Both development aid and bauxite exports are now significant in equation 2. By eliminating the indirect affect of ODA and BAUXEXPTEXP through RER, PUC, PUI and TRFS, the direct channels of these flows on per capita growth become significant. Another interesting event is the insignificance of the two dummies.

But more elaborate reporting on the significance, magnitude and signs of the estimated coefficients, will follow next when equation 3 is reviewed.

Equation 3 is believed to be the best equation to estimate the growth of real per capita GDP. The goodness of fit indicator, R^2 (0.745) is sufficiently high and the computed F(8, 22) = 8.05 is larger than the F-value in the F-table (Gujarati; 2003, table D.3, p. 966) for the same degrees of freedom (2.40). Besides, most of the included variables are individually significant (see t-statistics). BAUXEXPTEXP has the coefficient with the highest magnitude[31], negative 0.879 (t = -4.47) meaning that an 1 % increase in the ratio of bauxite exports to total exports

[31] The same for all the equations were BAUXEXPTEXP is significant. It is the less inelastic of all the variables in this equation

will on average decrease real per capita GDP growth with approximately 0.9 %, hence illustrating the Resource Curse hypothesis for the Surinamese data for the period 1970-2001. At the same time, development assistance had an overall positive impact on growth. The results reveal that a 1 % increase in ODA flows will on average boost growth with approximately 0.05 %.

It is remarkable to see that gross fixed capital formation has no significance what so ever in estimating per capita growth. Take note that this time series had several deficiencies. Introducing the lag version of this variable (equations 5 and 6) did not change the picture. But it should be noted, that the residual of the equation was cointegrated, which means that even if the individual variables are not significant, there still is a long term relationship among them.

The sign of the RESPUC (t = 1.09) coefficient implicates that public consumption is positively related to per capita growth. However, neither the public consumption variable with development aid and bauxite revenues influences, nor the "pure" public consumption variable are significant in this model.

The RESPUI (public investments after simultaneity correction) variable appears to be positively related to growth. Furthermore it is significant with a t-value of 3.15. The magnitude of the coefficient implicates that a 1 % increase in public investments will on average increase per capita GDP by 0.12 %. So on average public investments are proved to be growth triggering, whether or not financed from ODA (see also equation 1).

The real exchange rate has not performed as expected in this equation. The sign is negative, meaning that depreciations on average in the study period had not led to growth. According to the theory, real exchange rate depreciations should be stimulating for at least agricultural and manufacturing exports. In Suriname the real exchange rate had some impact on the largest agricultural exports (rice and banana). However, since these exports operate mainly in a protected market with higher than world market commodity prices, as such exports were always guaranteed[32] . Demand was practically fixed at a higher than equilibrium price level. In other words, appreciations benefited the economy more, even if not significant (t = -0.25). Another reason that is attached to the former is that frequently real exchange rates are

[32] Through a quota system

insignificant if regressed against commodity exports since the demand for the latter is inelastic.

According to San A Jong (2003) the eradication of the exchange rate premium has not resulted in growth improvements in the economy.

Transfers and subsidies (RESTRFS) on average had a positive impact on per capita growth from 1970-2001. The coefficient indicates that a 1% increase in transfers and subsidies would possibly increase per capita GDP by 0.19 %, which is somewhat higher than public investments' impact on growth (0.12 %). It can then be assumed cautiously, that transfers to the public and subsidies on public goods on average helped in the enhancement of human capital and hence per capita GDP in Suriname in the period 1970-2001.

Finally, it is observed that trade regime change had on average no positive impact on economic growth. According to the results in years of trade regime changes, which have the value of one (1) in this logical variable[33] , the per capita GDP on average shrunk by almost 0.13 %. This dummy variable is significant with a t-value of -2.20.

Among others, the trade regime changes in the years 1994-2001 has diminished government revenues (especially from tariffs and duties) significantly (San A Jong; 2003). Were it was believed that cheaper imports would lower the cost of living and hence foster growth, the "*downward adjustments of the tariff has generated very little positive growth stimulus for trade and even more important for GDP*" (San A Jong; 2003, p. 74). Imports and exports developed in different ways before and after the tariff cuts. It is worth mentioning that exports did not move in line with changes in the tariff rates. Moreover, since the tariff cuts, output growth (GDP) declined from an average annual growth of 4 % in the period 1987-1993 to an average of 0.4 % in 1994-2001 (see Annex A, Table 1).

[33] 0 = no trade regime changes and 1 = trade regime changes

V.4 The Mineral Stabilisation Fund Variable

The Mineral Stabilisation Fund (MSF) variable is not yet included in the model, but is subject for further study. But it is clear that by injecting funds into some of the channels like public investments and transfers and subsidies in the case of Suriname, growth can be stimulated. And it is there where a MSF can play a crucial role.

The IMF (2001) used the following cross country regression to measure the impact of non-renewable resource export earnings on government expenditure:

$$\Delta G_t = b_0 + b_1 \Delta X_t + b_2 \Delta X_{t-1}$$

where G is central government expenditure and X is non-renewable resource export earnings. After retrieving the results from this regression, a scenario with a price shock is tested to see the impact of these exports on government spending. The key question here is whether the relationship between these export earnings and government spending changed after a MSF was created. As such, a pre- and post MSF situation is simulated and the MSF introduction is treated as a structural break. This structural break is among other things then assessed with the Chow test for structural stability.

This test had ambiguous effects depending on the particular country situation, the structure of mineral rent spending and furthermore there were no structural breaks found with the introduction of an MSF. So the empirical evidence from a significant amount of countries reveals that MSFs did not have an impact on government spending.

In the case of Suriname some kind of reserve fund would be a remedy, since the different gaps in the economy (savings-investment, trade/foreign exchange, and fiscal budget gap) are strongly dependent on foreign financing, as domestic savings, which play a eminent role in sustainable development as seen in the newly industrialising countries (Auty; 2003), are insufficient. Besides, domestic stock markets, as an alternative financing source, are severely underdeveloped.

Table V:3 – Real Per Capita Growth Regression Model (Standard 5% Level of Significance)

Regression (dpcrgdp)	1		2		3		4		5		6	
log(bauxexptexp)	-0.182	(-0.90)	-0.953	(-3.86)	-0.879	(-4.47)	-0.765	(-3.20)	-1.224	(-3.70)	-1.171	(-5.36)
log(oda)	0.029	(1.25)	0.045	(2.18)	0.051	(2.98)	0.050	(3.70)	0.063	(2.55)	0.063	(3.61)
log(puc)	0.076	(1.15)										
log(pui)	0.122	(2.87)										
log(rer)	-0.015	(-0.24)										
log(gfcf)	0.001	(0.02)	0.001	(0.02)	-0.002	(-0.05)			0.095	(1.23)		
log(trfs)	0.204	(3.12)										
respuc			0.076	(1.15)	0.069	(1.09)	0.069	(1.07)	0.193	(2.43)	0.155	(2.23)
respui			0.122	(2.87)	0.128	(3.15)	0.136	(3.18)	0.148	(3.16)	0.158	(3.96)
resrer			-0.015	(-0.24)	-0.016	(-0.25)	-0.026	(-0.42)	-0.026	(-0.36)	-0.021	(-0.37)
restrfs			0.204	(3.12)	0.190	(3.23)	0.178	(3.39)	0.148	(2.42)	0.199	(4.31)
lag_log(bauxexptexp)							-0.159	(-0.78)				
lag_log(oda)												
lag_respuc									-0.086	(-1.34)	-0.099	(-1.62)
lag_respui												
lag_resrer									-0.009	(-0.12)		
lag_log(gfcf)									-0.165	(-1.65)	-0.090	(-1.56)
ward	(-0.036)	(-0.51)	-0.036	(-0.51)								
trod	(-0.163)	(-1.97)	-0.163	(-1.97)	(-0.135)	(-2.20)	-0.133	(-2.14)	-0.108	(-1.77)	-0.113	(-1.99)
R2	0.7485		0.7485		0.7454		0.7284		0.8093		0.7880	
Adj. R2	0.6407		0.6407		0.6528		0.6250		0.6860		0.6926	
Prob. F	0.0001		0.0001		0.0000		0.0002		0.0003		0.0000	

t-statistic between brackets: shaded t-values are significant

Source: Author's Calculations

CHAPTER VI CONCLUSIONS AND POLICY IMPLICATIONS

VI.1 General Conclusions

For years now the Surinamese economy has been considerably dependent on both development assistance from the Netherlands and bauxite export receipt from bauxite mining conducted by two multi-nationals. This dependence was a direct result of the countries inability to raise domestic savings to finance development in a sustainable manner. This inability was significantly linked to the colonial history of the country, meaning that structures and institutions established in the colonial era still had their impact on the contemporary functioning of the system.

This paper was not meant to be a "myth buster", but nevertheless the analysis and some of the outcome reveal that for many years somewhat unexplainable developments in the Surinamese economy became myths. It is now clear that the "*cork on which the Surinamese economy floats*", the bauxite sector, has proven on the basis of the data, the assumptions and the model used, to be "*leaking, floating in a wrong direction and worse: sinkable*". The vast earnings from this sector have on average not been sufficiently distributed in a manner that stimulates growth and sustainable development, since the so eminent backward- and forward linkages of this sector with the rest of the economy were (almost) absence. Only in the last sub-period (1997-2001) were some significant backward linkages established, when almost the complete heavy vacuum oil need in the alumina production process was been covered by the State Oil Company[35]

Another myth has to do with development assistance from the Dutch development cooperation Treaty with Suriname. It has been widely believed that overall this development assistance has been a total failure, when eye-balling the condition of the country before the Treaty and now. A somewhat stricter analysis of the data and transmission channels reveal that on the long run on average this assistance positively, but slightly, supported economic growth in Suriname. The low magnitude of the aid influence on growth however should be an

[35] A 20 plus kilometre pipeline was specially build for that purposes from the oil refinery to the alumina refinery.

eye opener for policymakers on both sides of the Atlantic Ocean to reform the existing aid policies in order to enhance aid effectiveness.

Nevertheless, in distinguished sub-periods in history Dutch Disease and Resource Curse features, in general had been identified, especially in the 80's after the simultaneous events of Dutch development assistant suspension and falling commodity prices. Public consumption remained on a high, boom-period level. Simultaneously, the real exchange rate was kept on an unsustainable appreciated level while the government pursued foreign exchange restrictive consolidation policies such as import contingency and the establishment of import-substituting infant industries (also called resource based industries), which policies were common in the 80's (the Prebisch-era) in Latin America. Scarce resource rents were in many ways used inefficiently and ineffectively with these policies.

Due to a lack of production and employment data, besides the fact that there is no real manufacturing sector in Suriname, in the sense of user commodities produced with innovative technology and a highly mechanised agriculture sector, which operates on an uncompetitive commodity market (EU/ACP), the common analysis of Dutch Disease, was not conducted. Alternatively, the dependence of the economy on development aid and natural resources was illustrated.

Another alternative was the analysis of the transmission mechanism, were an attempt was made to trace the influence of development aid and resource rents on economic growth. This analysis revealed at the end which of the identified and studied channels are important in preventing Dutch Disease and Resource Curse in the future.

Public investments and subsidies and transfers proved to be feasible channels to stimulate per capita wealth. However, the magnitude of their influence was very low.

Real exchange rate seems not to be a feasible candidate if exchange rate and trade regimes remain as they were in the period 1970-2001. This was proved by the fact that the reduction of tariffs alone did not accommodate economic growth.

The importance of a mineral stabilization fund was however not modelled, due to the lack of time and space. But it remains a subject of further study. Nevertheless, a qualitative analysis

of country situations with MSFs revealed that having such a fund can have ambiguous effects on for instance government expenditure. For some countries the fund had a positive effect, for some not. But it is believed, based on Suriname's particular country situation with respect to among other things the domestic savings, that a reserve fund is inevitable.

VI.2 Policy Recommendations: Mineral Stabilisation Funds And Development Assistance For The Private Sector As A Foundation For Sustainable Development

Based on the above analysis, some general policy recommendations can be formulated.

These recommendations are a hybrid of both neo-classical and structuralist policy considerations and are not exhaustive. Neo-classical theorist emphasize on the accumulation of financial capital (stabilisation- and or savings funds) and the unlimited functioning of the market (trade openness and unrestricted exchange rate markets), while structuralists focus on the re-distributional feature of financing sustainable development through government transfers, subsidies and public investments. This paper makes a modest attempt in revealing the possibilities of how to transform a "curse" into a "blessing". It all comes down to the need to reallocate resources away from current consumption, towards investments in domestic capital that have the ability to diversify the economy in such a way, that the dependence on the unsustainable depletion of finite natural resources is drastically decreased (Auty; 2003).

At present, government revenues from natural resource rents are not exclusively earned from bauxite exports. Crude oil and gold exports have increasingly supported the country's revenues base and external sector situation. At the same time aid from the Dutch development cooperation Treaty is gradually coming to an end. The gap that will be created by this on both, government revenues and the capital account of the balance of payments, can cause substantial distortive affects in the development process of the country. Throughout the major part of history, development aid financing has been a sole prerogative of the Surinamese government in both obtaining and spending the resources. Since the analysis in Chapter V revealed that existing structures of investments, transfers and subsidies are not very efficient, a recommendation would be to include the private sector into the equation of

effective redistribution of aid resource. Many Surinamese governments have studied the possibilities of privatising state owned enterprises in order to make them efficient and profitable and eventually significant payers of tax, which will mean more government earnings than before. Domestic entrepreneurs and enterprises can be supported by loan schemes and technical assistance based on development aid to smoothen the transition of privatized enterprises under explicit regulations and guidelines.
Mineral stabilization funds have proven not to be a remedy in all cases. Still it is not merely the introduction of an MSF that will have an impact on spending. It is however, the government's ability to identify and to target potential bearers of economic growth and sustainable development that is crucial, and how it canalizes the needed funds towards these targets.

Public investments in physical infrastructure such as roads, schools, hospitals appeared to foster sustainable development in for instance Botswana. At the same time it was proven that resource rent dependency of that government eventually diminished (Hill; 1991).

In Suriname's case the model results also reveal public investments and transfers and subsidies as possible candidates to redistribute rents. However, the government has to make the existing investment and transfers and subsidies systems more efficient and effective in order to increase their stimulus on growth.

The possibility to establish export processing zones and linked infrastructure (Hjertholm et al; 2001) is to be considered, moreover since trade expansion, especially export expansion, can be a direct impulse for economic growth. That is why trade regime changes should not only be focussed on tariff structure changes if its main purpose is to stimulate growth.

Furthermore, the frequently studied transition from object to subject subsidies which can have different positive results such as a direct targeting of poverty and human capital accumulation and a better functioning of the market of goods and services, should be a considerable option.

The establishment of such reserves accumulation schemes however, is not without (political) risk, since people and labour unions become impatient in the process of postponing current wealth delight. Governments are pressured to pursue expansionary fiscal policies and

"physical" expansionary policies[36]. However, in the case of Suriname, if the state does not implement a public sector reform program very soon, an MSF will not be effective at the end, since unstable government expenditures due to a large and inefficient civil service apparatus will put a substantial pressure on these funds. Also, prudent public expenditure policies should be designed, to shield off the economy from uncontrolled spending of stabilization fund resources, as was done in the case of Norway (Larsen; 2003).

There is much more to be done, but hopefully these recommendations can somehow assist in making the Surinamese economy immune to Dutch Disease and Resource Curse on the long run.

[36] Expansion of the public sector

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ANNEX A RELEVANT INFORMATION ON MACRO-ECONOMIC INDICATORS

Annex A: Table 1 – Price and Volume Developments of Bauxite Sector Exports 1970-2001

	ALAVOL	ALAPR	BAUXVOL	BAUPR	ALUVOL	ALUPR
1970	893.4	63.0	3,400.0	11.9	52.8	487.0
1971	1,148.7	63.7	3,600.0	12.3	47.4	504.5
1972	1,279.1	64.7	3,500.0	13.1	52.6	507.0
1973	1,209.0	66.5	3,666.0	13.0	54.2	459.4
1974	1,077.0	93.3	3,974.0	21.0	54.1	702.4
1975	1,087.0	116.5	2,302.0	27.5	26.4	833.3
1976	1,070.0	130.7	1,989.0	28.4	46.3	840.2
1977	1,059.0	143.4	2,172.0	30.2	57.7	1,029.5
1978	1,125.0	156.4	2,241.0	32.2	55.0	1,105.5
1979	1,199.0	159.4	1,737.0	32.4	62.7	1,169.5
1980	1,329.0	213.0	1,767.0	40.7	45.3	1,437.8
1981	1,166.0	230.2	1,269.0	50.4	31.6	1,563.6
1982	1,055.0	220.7	500.0	40.2	60.3	1,165.8
1983	1,143.0	189.4	448.0	67.0	28.7	1,214.7
1984	1,096.5	183.8	957.3	42.5	29.4	1,455.8
1985	1,265.2	138.8	992.5	36.2	28.1	1,098.5
1986	1,342.6	132.1	839.8	32.1	29.5	1,183.1
1987	1,342.6	145.1	322.6	32.1	3.2	1,102.9
1988	1,630.0	177.7			7.6	1,931.3
1989	1,553.4	281.5			26.1	1,969.3
1990	1,473.1	240.4			31.9	1,586.2
1991	1,449.1	180.6			26.3	1,524.7
1992	1,513.6	158.6			34.5	1,284.1
1993	1,426.1	153.9			28.7	1,219.5
1994	1,385.0	155.2			25.0	1,280.0
1995	1,586.0	195.5			26.3	1,733.8
1996	1,608.0	191.5			27.0	1,548.1
1997	1,647.0	190.2			28.0	1,653.6
1998	1,725.0	172.0			28.0	1,403.6
1999	1,858.0	159.8			7.0	1,228.6
2000	1,869.0	182.9				
2001	1,893.2	174.5				

(Prices are in US$ per metric tons; volumes per 1000 metric tons)

Source: Database I. San A Jong; 2004

Annex A: Table 2 – Overview of total of Treaty Funds and Grants in the period 1975-2000 (In DFL millions)

	Cancellation of Debt	**Treaty Funds**	**Rest Funds 2nd Five year Plan**	**Rest**	**Total**	**Money Transfer**	
1975	517	0	83	0	600		83
1976-1982	0	1165	253	0	1418		1418
1983-1987	0	10	0	0	10		10
1988-2000	0	1030	0	82	1112		1112
Realisation 1975-2000	517	2205	336	82	3140	2623	(62%)
Potentially Avail.	517	3800	336	82	4735	4218	(100%)
Balance per Dec. 31 2000	0	1595	0	p.m.	1595		1595
					+p.m.		+p.m.
Category	*No Money Transfer*	*Mainly investments*	*Investments*		*Mainly Investments*	*Mix*	*Mix*

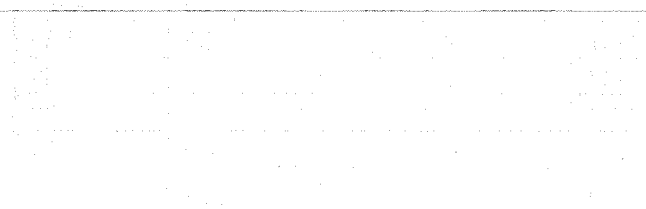
Source: Translated from Kruijt and Maks (2003) "Een Belaste Relatie" Ch.1, p.11

Annex A: Table 3 – Preserved Bauxite Rents (in millions of SFL and US$)

	BARG	MSF	MSFUS$	NERBOP*
1970	44	4	2.3	1.89
1971	52	5	2.8	1.89
1972	51	5	2.9	1.79
1973	47	5	2.6	1.79
1974	135	14	7.6	1.79
1975	99	10	5.5	1.79
1976	100	10	5.6	1.79
1977	124	12	6.9	1.79
1978	152	15	8.5	1.79
1979	150	15	8.4	1.79
1980	173	17	9.7	1.79
1981	151	15	8.4	1.79
1982	110	11	6.2	1.79
1983	102	10	5.2	1.95
1984	84	8	4.7	1.79
1985	61	6	3.4	1.80
1986	33	3	1.9	1.73
1987	28	3	1.5	1.89
1988	39	4	2.2	1.78
1989	58	6	3.3	1.78
1990	121	12	6.9	1.76
1991	66	7	3.7	1.76
1992	35	3	0.4	9.67
1993	107	11	0.4	24.47
1994	4,336	434	3.2	134.62
1995	19,221	1,922	4.4	441.78
1996	16,572	1,657	4.1	401.93
1997	11,805	1,181	2.9	401.00
1998	10,358	1,036	2.6	401.00
1999	15,443	1,544	1.8	859.90
2000	28,707	2,871	2.2	1326.30
2001	82,950	8,295	3.8	2178.50

* = denominated as SFL for US$1,-

Source: Database I. San A Jong; 2004; and Author's Calculations



ANNEX B ECONOMETRIC VARIABLES AND RESULTS

Annex B: Table 1 – Variables Used in Regression Analysis (in millions of SFL)

	RGDP	BAUXEXP	ODA	RER*	PUI	PUC	TRFS	GFCF	BARG	WARD
1970	1,076	452	82	1.431	62	232	34	197	87	0
1971	1,118	498	64	1.460	53	243	30	196	97	0
1972	1,111	498	79	1.402	61	239	36	237	92	0
1973	1,090	438	54	1.331	66	238	44	251	76	0
1974	1,095	550	79	1.364	60	222	53	341	188	0
1975	1,126	460	96	1.384	96	253	50	370	120	0
1976	1,186	483	183	1.326	157	301	49	266	115	0
1977	1,357	508	142	1.293	158	343	53	299	127	0
1978	1,531	542	97	1.290	143	339	44	272	149	0
1979	1,493	514	129	1.275	119	325	54	283	135	0
1980	1,590	750	132	1.285	128	339	108	342	173	0
1981	1,694	649	161	1.291	167	410	97	459	144	0
1982	1,542	481	144	1.226	158	453	83	430	92	1
1983	1,466	449	0	1.297	93	481	84	293	84	1
1984	1,391	416	2	1.177	68	456	160	256	68	1
1985	1,365	352	2	1.064	44	486	162	251	49	1
1986	1,362	314	4	0.834	30	559	142	259	25	1
1987	1,211	248	4	0.610	16	479	122	197	17	1
1988	1,370	320	9	0.559	25	479	137	194	23	1
1989	1,521	491	21	0.580	49	473	144	254	33	1
1990	1,844	357	22	0.488	48	391	137	293	61	1
1991	1,906	231	9	0.390	17	437	222	290	29	1
1992	1,952	881	15	1.496	35	446	138	296	11	1
1993	1,723	838	57	1.577	49	236	101	250	14	1
1994	1,937	977	41	1.876	64	200	133	660	127	0
1995	2,181	1,260	221	1.901	91	509	114	887	154	0
1996	2,142	1,146	353	1.782	128	630	165	1,258	135	0
1997	2,055	914	181	1.659	108	528	160	1,004	75	0
1998	2,133	658	129	1.358	90	705	110	420	51	0
1999	2,049	715	55	1.478	126	415	139	308	42	0
2000	1,926	764	38	1.513	46	580	139	269	48	0
2001	1,973	849	32	1.814	47	368	193	283	98	0

*= SFL/US$1

Source: Database I. San A Jong; 2004; and Author's Calculations

Variables Used in Regression Analysis (in millions of SFL) [Continuation]

	MSF	BAUXEXPTEXP	BAUXEXPRGDP	PCRGDP**
1970	9	0.87	0.42	2892
1971	10	0.86	0.45	2957
1972	9	0.87	0.45	2910
1973	8	0.87	0.40	2839
1974	19	0.82	0.50	2871
1975	12	0.76	0.41	3089
1976	12	0.77	0.41	3346
1977	13	0.80	0.37	3748
1978	15	0.78	0.35	4169
1979	13	0.72	0.34	4091
1980	17	0.82	0.47	4459
1981	14	0.77	0.38	4768
1982	9	0.72	0.31	4248
1983	8	0.80	0.31	3955
1984	7	0.78	0.30	3676
1985	5	0.73	0.26	3542
1986	3	0.71	0.23	3489
1987	2	0.68	0.20	3077
1988	2	0.72	0.23	3452
1989	3	0.79	0.32	3793
1990	6	0.73	0.19	3759
1991	3	0.65	0.12	3864
1992	1	0.59	0.45	3903
1993	1	0.72	0.49	3386
1994	13	0.73	0.50	3698
1995	15	0.81	0.58	4071
1996	14	0.81	0.53	3955
1997	7	0.63	0.44	3764
1998	5	0.66	0.31	3885
1999	4	0.63	0.35	3765
2000	5	0.67	0.40	3441
2001	10	0.73	0.43	3465

**= in SFL

Source: Database I. San A Jong; Central Bank of Suriname Annual Reports 1957-1995; From D. Kruijt and M. Maks "Een belaste relatie"2003; Author's Calculations

Annex B: Table 2 – Variable Names

ABCAP	Public Absorption Capacity or PUC + PUI
ALAPR	Alumina export prices in US$/1000 metric ton
ALAVOL	Alumina export volume per 1000 metric tons
ALUPR	Aluminium export prices in US$/1000 metric tons
ALUVOL	Aluminium export volume per 1000 metric tons
BARG	Bauxite Revenues of the Government
BAUEXP	Bauxite sector Exports
BAUXPR	Bauxite export prices in US$/1000 metric tons
BAUXVOL	Bauxite export volume per 1000 metric tons
CPI	Consumption Price Index (rebased 1980 = 100)
CROIL	Crude Oil Exports
DEFL	GDP deflator (factor cost average of current and constant prices)
EMPLMIS	Employees in the Mining Sector
FISDEF	Fiscal Deficit
GFCF	Gross Fixed Capital Formation
MEXP/GDP	Share of mineral exports in GDP
MEXP/TEXP	Mineral Exports share in Total Merchandise Exports
MEXP	Total Mineral Exports
MYPOP	Midyear Population
NERBOP	Balance of Payments Nominal Exchange Rate

NGDP	Nominal Gross Domestic Product (incl. Informal Sector)
NIT	Net International Reserves
ODA/GDP	Share of Official Development Aid in GDP
ODA	Offficial Development Assistant & Official Aid
PCNGDP	Per capita Nominal GDP
PCRGDP	Per capita real GDP (using midyear population)
PPIUS	Producer Price index (USA)
PRIC	Private Consumption
PUC	Public Consumption (Wages/Salaries & Material Costs)
PUI	Public investments
RER	Real Exchange Rate ((NERBOP/CPI)/($1/PPIUS))
RGDP	Real Gross Domestic Product (incl. Informal sector)
TEXP	Total Merchandise Exports
TGCR	Total Government Current Revenue
TRFS	Transfers (including Social Transfers, Subsidies and Net Lending)
TROD	Dummy for Years Changes Trade Regime
WARD	Dummy for war and military regime years

Annex B: Table 3 – Descriptive Statistics

Variable	Obs.	Mean	Std. Dev.	Min	Max
pcrgdp	32	3635.2	480.1	2839	4768
bauxexptexp	32	0.75	0.075	0.59	0.87
oda	32	82,500,000	79,700,000	0	353,000,000
rer	32	1.275	0.397	0.39	1.901
puc	32	400,000,000	130,000,000	200,000,000	705,000,000
pui	32	81,200,000	45,500,000	15,700,000	167,000,000
trfs	32	107,000,000	51,400,000	29,600,000	222,000,000
gfcf	32	371,000,000	245,000,000	194,000,000	1,260,000,000
ward	32	0.375	0.4918694	0	1
trod	32	0.25	0.4399413	0	1

Source: Author's Calculations

Annex B: Table 4 – Correlations among Residuals

	resrer	*respuc*	*respui*	*restrfs*
resrer	1.0000			
respuc	-0.1686	1.0000		
respui	0.2899	0.1771	1.0000	
restrfs	-0.0361	0.5345	0.0346	1.0000

Source : Author's Calculations