Guyana: A Half a Century of Struggles with Planning, Growth, and Development

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Abstract. Guyana was a proving ground for both the capitalist and socialist development ideas in the latter half of the 20th century. We analyze the problems and solutions for those experiment from the point of views of appraising their performances. Traditional theories such as input-output models, sectorial models, and growth models form the windows for the appraisal. When the subject matter is judgmental, Analytic Network Process and (ANP) and Data Envelop Analysis (DEA) are engaged. When the subject matter is structural, the time series of gross investment to GDP is considered as a driver of growth. We subject that ratio to spectral and cross-spectral analysis for a half a century of data for Guyana vs. neighboring countries. The results indicate that Guyana has stepped into the long-run cumulative growth process after its struggles with development.

Keywords. Development, Planning, Sectorial Models, Analytic Network Process, Data Envelop Analysis, Spectral Analysis.

JEL. C00, C15, C88.

1. Introduction

In the latter half of the 20th century, growth experiments in Guyana were in a trial-and-error mode. Those experiments ran the course of an economic plan, varying from one to ten years. Different regimes emphasized either meansto endsor the reverse. A plan mayfix "…a number of aims or objectives and derives from them the means needed for their fulfillment. (Tinbergen 1972 pp. 141-142) Under laissez-faire models, the mean to end approach is common. The ends may be the size of capital, annual production, ethically defined goal, and per capita real income. (Robbins 1968, p. 4) The elements of the set of plans we looked at differ in the selection of variables that arechosen with a view to attain optimal growth with regards to GDP and redistribution of income. (Ibid, p. 142) Now that the plans have been distilled over time, a clear direction is revealed, namely that that planning with a market vision for growthcomes out as the dominant method for Guyana's growth.

As growth plans run their course, economists have been revising their models to include a more efficient cast of variables and industries. One the industrial side, an economic development idea was that Guyana should move from an agricultural to an industrial base. An ancillary to this is that during industrialization, the capital goods industries should grow faster than the consumer goods industries. (Hoffmann, 1970, p. 113) Capital can be raised internally or burrowed from abroad. Domestically, what is not consumed is savings, and many policies have been targeted at raising the saving rate. Guyana has also experienced abuilding up

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of infrastructure in an effort to attract foreign firms. Obtaining loans and grants from foreign countries and international institutions had been much sought-for during the period. Whether foreign or domestic, not only savings but also investment is necessary for growth. (Lewis 1970, pp. 213-214)

Revising growth plans for individual and others saving strategies can run into a dilemma. To illustrate from a savings perspective, let I_0 and I_1 represents individual action to increase ($\uparrow S$) or not to increase ($\sim \uparrow S$) savings, respectively. R_0 and R_1 represent similar strategies for the rest of the community. One can end up in a prisoner's dilemma situation. The "N" shaped path starting on the left with an up arrow, down the main diagonal and the up arrow in the last column, represents the preference structure. (Sen 1968, pp. 79-80)

$$\begin{matrix} I_0 = \\ I_1 = \end{matrix} \begin{matrix} \uparrow S \\ \sim \uparrow S \end{matrix} \begin{bmatrix} I_0 R_1 & \cdots & I_0 R_0 \\ \uparrow & \searrow & \uparrow \\ I_1 R_1 & \cdots & I_1 R_0 \end{bmatrix}$$

In such a planning structure, savings can be sub-optimal. (Ibid, p. xiv). Even a benevolent government may need to force savings. For the period 1965-1995 interest rates policies have led to a negative real return on savings down to -9.7 percent, which improved when inflation came under control. (Kendall 2000) One needs also to account for James Duesenberry 'demonstration effect', namely that even if income was real, one has to consider that the ability to save depends on relative and not absolute income. (Duesenberry 1949, p. 27) One way to accommodate that effect is to show that many new commodity were introduced in Guyana for that period, and because consumers wanted to imitate other consumption pattern, savings went down. The optimal saving choice depends also on a time consistency problem involving government policy as well. If the government makes a first move, individuals will calculates their equilibrium savings according to say the Ramsey version. In the Nash version, the government is allowed to readjust to the individual choices. (Ljungqvist & Sargent 2000, pp 460-460)

Selection and measurement of variables are also an issue. Formerly, the standard set of variable included natural resources, capital, information, people and government action. (Lewis, 1966b, p. 8). In the modern approach, a wider cast of variables will include well-being, capability, and functioning elements of the labor force. (Dasgupta 1993) Besides measuring, the mapping of these variables may have an unexplored invariant issue. (Sen 1995, p. x)Also, a super-structure exists that would dissuade whatever cast of variables are chosen. W. A. Lewisidentified that structure: "In making a Plan, technique is subsidiary to policy… the secret of successful planning lies more in sensible politics and good public administration." (Lewis, 1966a, p. 9)

Before independence, Guyana was under a colonial capitalist regime. Under capitalism, growth advance bit-by-bit and smoothly. Econometric forecastswere used extensively. Growth is market based, where we typically find that: "The owner of the enterprise chooses for production those goods which at a given moment have the highest price, can most easily be sold, and therefore give the largest profit. The raw material used is not that of which there are huge supplies in the country, but that which the entrepreneur can buy most cheaply. The question of the maximum utilization of equipment is not raised; in any case, the majority of enterprises work at half capacity." (Kantorovich 1960, p. 368)

One can also distinguish between single and multi-objective plans. A single objective plan in Jan Tinbergen terminology will set one aim or objective and look for the means to achieve it. Such a plan was exemplified in India's plans after its

independence. The objective in India for approximately three decade was to assure "minimum incomes to the country's numerous destitute and poor". (Bhagwati 1998, p. 25) An implication of this is that "going for growth rather than attacking poverty" confuses "means with ends." Growth was used as an instrumental variable in the early Indian plans. (Ibid., p. 27) In common practice was the Y = C + I model, in which C and I growth rate are specified for an initial period and calculate forward for 35 years, from 1958 to 1991. (Desai 1998, p. 45) In that model, capital goods were prioritized over consumption goods.

The early plans in Guyana (see Appendix) for over the half a century time-frame tend either to maximize GNP or minimize infrastructure costs for either egalitarian goals or profits. To the extent that these programs overlap, one can treat them a multi-objective programming and planning problems. Guyana had several single objective plans that maximize either per capita income, or minimize poverty. Multi-objective plans combine those objectives together. (see Cohon, 2003, Ch. 6) For example, the Kaldor and the Lewis plans were multi-objectives. They combined income redistribution and infrastructure goals, which can be described as a fractional nonlinear programming problem. These are special case of non-linear programming problems with ratios of linear objective function and linear constraints. They tend to fit development situation because "In real life model, the possible values of coefficients of a linear programming problem are obviously unclear and vague." (Pandian & Jayalakshmi, 2013, p. 90) This fractional model can be expressed in a form that can accommodate multiple objectives. GNP can be defined in the Keynesian Consumption and Investment sense, or in the Kaldorian Profits and Wages sense. Fractional models tend to take the following form:

$$\mathbf{Max}\, \frac{f_i}{g_i} = \frac{GNP = C + I}{Costs} = \frac{GNP = P + W}{Costs}, \text{ with appropriate constraints.}$$

During the timeframe of our study, the faith of Guyana's development plans kneeled to two forces, the market view on the one hand, and the Soviet and Indian economic plans on the other. The Soviet model started with Kantorovich invention of Linear Programming techniques before the western mathematicians. Kantorovich sought optimal plans for the allocation (in pct.) of given resources to a set of production activities. In the short-run, there are $h_{i,k}$ coefficients of allocation of resources for k-resources to i-activities. He used assortment ratio, which for instance means output are produced in equal quantities. The market plan was more time-honored but, for a while, was slow to industrialize Guyana. Overall, one finds struggles on several policy activities during the period. The tug-of-war between the two alternatives witnessed conspicuous activities in Guyana, which includes:

1.   Dismantling of domestic regulation, and the embracing of openness to the global economy.

2.   Movement from import-substitution to export competitiveness policies, which finance imports through exports gains.

3.   Maintaining expenditure on human capital—health, education, and rural developments.

4.   Policies targeting economic growth and the reduction of poverty, emphasizing employment over capital formation that dominated the older planning models.

5.   Financial liberation has allowed corporations to raise capital from abroad.

6.   Debt forgiveness

1.1 The Major Plans Starting with 1950s.

The 1950s was a period of significant planning facts for the then British Guiana economy. The first ten years planhad one Input-Output table for 1951, (Clark et al.,

1953, p. 106) and another in 1959, (Kundu, 1963, pp. 33-34).From those studies, one gets a snapshot of growth in the 1950s. The picturedepicted in Table I suggests strong growth under colonialism for the decadethatpreceded Guyana's independence. While the political sphere was undergoing changes, it appears to have little distorting effect on growth. The significant political changes include a suspension of the constitution in 1953, while allowing Guyana to have self-government. Table I shows growth for four major industries for the ten years period.

Table 1: *Major Industries*

		1951	1959	Annual Change
1	Agriculture	40.7	79.1	11.79%
2	Mining	19.6	29.8	6.51%
3	Manufacturing	30.4	57	10.94%
	Food Processing		134	
	Chemical		17.3	
	Engineering		60	
	Other manuf.		57	
	Fuel&power	2	16.7	91.88%
	Build. &Const.	28.4	70.5	18.53%
4	Trans & Com.	11.1	25.6	16.33%
5	Bank. &Ins.	40.1	10	-9.38%

Source: Tabulated from input tables

One can get an idea of how this growth was achieved from the source and use data from the 1951 input-output plan. The plan was for five yearwith the sources and uses of funds in Table 2.

Table 2: *Source and Use of Funds: Plan 1954-1958 ($M Guyanese)*

	Uses	Pct.		Sources	Pct.
Agriculture	24.49	37.49%	Government:		
Trans. & Comm.	22.30	34.15%	Revenues	30.5	46.21%
Forestry	2.28	3.49%	Loans not disbursed	5.3	8.03%
Social Welfare	7.45	11.41%	Surplus	3	4.55%
Public Works	5.45	8.34%	Repayments	1	1.52%
Ind. Credits	1.50	2.30%	Others Gov't	2	3.03%
Hydro. Power	1.44	2.20%	Grants:	11.1	16.82%
Surveys	0.40	0.61%	New Loans	13.1	19.85%
Total	65.31	100%		66	100%

Source: Tabulated from Clark et al, 1953, pp. 30; 43

The general idea of the Clark et al., 1953 plan was multipurpose, namely: 1. To enhance sectors that are urgently in need for improvements. 2. Continue the growth in the strong sectors, 3. To enable research in agriculture and related sectors for longer term growth, 4. To reduce dependence of foreign capital and grants but encouraging local saving and investments. Those goals were interruptedby the political changes that were taking place simultaneously, such as the right to self-govern under a colonial governorship, and the suspension of the Guiana constitution by Britain.

1.2. Kaldor Plan in theEarly 1960s.

The planned sectorial changes for Guiana were articulated this way by the then Prime Minister, Cheddi Jagan at an interview with *Meet the Press*. The object is to have:

> "…a balanced industrial and agricultural development. At the moment our economy rests on two products, sugar and bauxite. Eighty percent of the exports of our country come from these two products…. 80 percent of our economy is represented by two products and both of these industries are in foreign hands, which means a great outflow of capital every year. Taken over a long-term period there may be a greater net outflow of capital compared with what is coming in…if we have money, if we have help and assistance from outside, we must be free to put it, after we have been scientifically advised how to spend it, on the sectors which will generate wealth more rapidly, so that we don't have, all the time, to go and borrow money from the outside."
> (Cheddi Jagan, *Meet The Press*, 1961)

The steps that were followed to implement that plan did not materialize. It precipitated the event known as Black Friday on February 16, 1962. That event had happened because of a tax plan by the renowned economist Nicholas Kaldor in 1961. (Kaldor 1980) Kaldor wrote that during 1961, he was "pressed to examine and advise urgently… the budgetary position and tax system… in British Guiana." (Ibid., 1980, p. xi). For Kaldor urgency action means "to avoid balance of payments crises and enable sound development". (Ibid)

The object function was not the frequently use Maximization of Y = C + I. For N. Kaldor, the usual maximization function should address a sense of equality captured by the equation Y = Profit + Wage. Savings and Investment were seen through the profit and wage categories. Growth inHarrod-Domarterminology was the naïve accelerator times ($v = capital/Output$) percentage change in output, i. e., vG.But in Kaldorperspective, growth was specialized to capitalists saving, $G = rS_c$, where r = P/K or profits to capital. (Ramrattan & Szenberg, 2007, p. 43i)

Kaldor's "Proposals for a Reform and Taxation of British Guiana" puts production for sales before production for export. In his words: "…there is a clear need for a fairer contribution to local revenues by great international companies, from profits all too easily concealed by syphoning these off to tax havens through the device of "transfer pricing" between subsidiaries". (Ibid, 1980, p. xi) He advocated the "generation of savings from the locally employed population with earnings above a certain level." (Ibid) The actual proposal of Kaldor'splan includes 1. Import and exercise duties to at least $6m, 2. Policing tax avoidance and evasion to the amount of $1.5M, 3. Tax for savings of at least $6M, 4. Property taxes of at least $1. (Kaldor, Ibid. pp. 273-274; 298,, and 306). Following his model, GNP = Profit + Wages, Kaldor placed the tax burden mostly on the profit component. We have made the following likely distribution of the tax burden in order to ascertain a

likely impact on the economy using the production coefficient from the 1959 input-output table for the country. Table 3 is our propose distribution of the tax burden, showing that households will carry only $6.3 million of the burden.

Table 3: *Tax Burden for 1962 Kaldor Tax Proposal*

Tax Types	Govt Tax Receipts	Build / Const.	Rent & Dwelling	Household	Business
Property	$1,000,000	-300,000	-700,000		
Saving	$6,000,000	-500,000		-4000000	-1500000
Evasion	$1,500,000			-300000	-1200000
Imp.& Exc.	$6,000,000	-100,000	0	-2,000,000	-3,900,000
Sum	$14,500,000	-900,000	-700,000	-6,300,000	-6,600,000

According to the government position, the budget targeted the following objectives (Source: http://www.guyana.org/features/guyanastory/chapter156.html):

1. A net wealth tax at the rate of 0.5 percent of net wealth above $50,000;

2. A gift tax to prevent evasion of death duties;

3. Introduction of a scheme on compulsory savings on earnings in excess of $100 per month, or 10 percent of incomes and profits made by self-employed persons and companies, respectively. The money was to be invested in Government bonds bearing 3.75 percent interest annually and was to be tax-free and redeemable after 7 years;

4. A direct tax on luxuries and semi-luxuries which were mainly imported, and also on tobacco, alcoholic drinks and beverages."

1.3. Impact of Kaldor Plan

Kaldor said that "…the Budget speech of January 1962, which embraced all my recommendations, led to rioting in Georgetown, severe enough to involve calling in the British military". (Ibid, p. xiii). The leader of the opposition parties, Forbes Burnham of PNC partyand PeterD'Aguiar of the UF party opposed the plan. The tax burden was observed to fall too heavily on the rich. It seems apparent then that Burnham was interested in power, D'Aguiar wanted to protect his business interest, and the Trade Union Council were after higher wages, which was falling and had no room to be increased in a budget that was based on fiscal austerity measures in order to raise capital. But Jagan and his PPP party survived the challenges with a substantially reformed budget." (Kaldor 1980, p. xiii)

1.4. Guyana's Growth in the 1960s: Potential vs. ActualOutput

One can use the 1959 input-output table to assess the interruption of growth in the economy in the early 1960s. A first consideration is to recognize that the coefficients are static, representing the economy as of 1959. For that reason, most planning activities such as in India and Russia had been short-run, approximately five years. But this short-run time frame will suit the state of the Guyana economy well for the early 1960s.

A second consideration rests with the distinction between intermediate and final demand. Intermediate demand is treated as a dependent (endogenous) variable that depends on Final demand that is considered as an independent (exogenous) variable. (Leontief 1953, p. 147) Household demand makes up approximately three thirds of final demand, the rest accounting for imports, government, and capital final demand has many components of which household demand is about three third of intermediate plus final demand.

To make a short-period forecast of potential output, one can calculate the impact of policies on each industry, and use inter-industry coefficients to determine

the impact on final demand. The procedure starts with the construction of a model with input-output data to replicate the final demand in the table. This is accomplished by the standard matrix: $X = [(I - A]^{-1} \times Y$, where I is the identity matrix, A is the inter-industry coefficient, Y is final demand, and X is total output. A forecast is gotten by changing the values of the sectors, ΔY, and calculating its effect on output, ΔX.

This analysis can be done for the closed and open model, once we determine the sectorial changes. For this purpose, we use three consumption sectors available to close the model, namely, Household, Government, and Foreign Imports, as capital is distributed to plant and building industries. Several other steps are now required to use the closed model. First production coefficients, A, are calculated. Second, the tax revenues have toborne by the different sectors. The burden of the savings and evasion taxes of $2.7M will be born of a fair share criteria for each of the sectors 1 through 12. Agriculture, for example will pay a portion of that total equal to the agriculture dollars over the sum of dollars of the 12 sectors. The result is given in Column 2 of Table 4 below.

Third, we need to distribute the collected tax revenues to the different sectors. The easiest way to distribute the $14.5M proposed government tax revenues in Table 3 is to divide it equally amount over the 17 sectors. We have tried to make a fair share of the tax revenue to all 17 sectors, but abandoned that approach because the outcomeswere very unbalancing growth rates. Each sector average share is shown on Column 3. Total change in Column 4 is the sum of Columns 2 and 3. This total change is now plugged into the formula $\Delta X = [(I - A]^{-1} \times \Delta Y$ to get a forecast of changes in output shown in column 5. The forecasted level of output is the, sum of columns 1 and 5.

Table 4: *Input-Output Forecast for Guyana's 1962 Budget1959 (G$Million)*

Sectors	1 Output	2 Gov Rev. + Dist. Of Tax	3 Govt Rev. Shared to sectors	4 Total Change Tax Burden + Redistribution	5 $[I-A]^{-1}$ $\times \Delta Y =$ ΔX	6 New Level of Output	7 Percent Change
Ag	79.09	-0.40	0.85	0.45	0.52	79.61	0.66%
Livestock	35.08	-0.18	0.85	0.67	0.89	35.97	2.54%
Mining	29.79	-0.15	0.85	0.70	0.61	30.39	2.04%
Food Proc.	133.93	-0.68	0.85	0.17	0.03	133.95	0.02%
Chemicals	17.31	-0.09	0.85	0.77	0.87	18.18	5.01%
Engineering	59.97	-0.30	0.85	0.55	1.04	61.01	1.74%
OthMfn	57.01	-0.29	0.85	0.56	1.15	58.16	2.02%
Fuel power	16.74	-0.08	0.85	0.77	1.05	17.79	6.28%
Distribution	43.20	-0.22	0.85	0.63	1.53	44.73	3.53%
Tran&Comm	25.59	-0.13	0.85	0.72	1.01	26.60	3.95%
Bank. & Ins.	9.99	-0.05	0.85	0.80	1.23	11.21	12.26%
Professional	24.19	-0.12	0.85	0.73	0.85	25.04	3.50%
Build./Const.	70.57	-0.90	0.85	-0.05	0.26	70.83	0.36%
Rent Dwell	7.26	-0.70	0.85	0.15	0.15	7.41	2.12%
Government	44.81	14.50	0.85	15.35	1.64	46.45	3.67%
Households	234.51	-6.30	0.85	-5.45	0.04	234.55	0.02%
Foreign(Imp)	127.34	-3.90	0.85	-3.05	-0.61	126.73	-0.48%
Total	1016.36	0.00	14.50	14.50	12.27	1028.63	1.21%

The total changes will give a modest 1.21 percent growth. Foreign imports is the only sector that will shrink, which is consistent the view to tax luxury imports. Banking and Insurance will growth most rapidly at 12.6 percent, perhaps to reverse the negative trend between 1951 and 1958 shown in Table 1.

The scenario in Table 4 would not support the concerns of the opposition parties that the 1962 budget was against business. The current view is that the PNC, UF, and The Trade Union Council (TUC) whose majority members were PNC supporters set out to sabotage the PPP government in the presences of notable worldwide supports for the government 1962 budget. For instance we note the "The *New York Times* said in an editorial that the budget was courageous and economically sound. The London *Times* in a leading article observed: "The immediate problem for the Prime Minister, Dr. Jagan, is how to win some acceptance for his economic proposals which are courageous and certainly not far from what Guiana must have." (op. cit., www.guyana.org, Ch. 156) One need to make some explanation for the skepticism of Jagan government in the face of those strong budgetary endorsement.

1.5. Skepticism of the Jagan Government

When CheddiJagan took office in 1962 his outlook was socialism. Growth means meeting the objective of a state plan. Law of motion of the economywere postulated, and policy measures as to what was to be done were drawn up. Following the dialectic method, one is able to build in future catastrophic events into such a plan. It is arguable whether such a plan follows a pull-up rather than a trickle down benefit system. Value and distribution must reflect social marginal product.

One thing stands out in these early plans for Guyana: they did not have the foresight of long-term changes. First, the expectation of independence materialized in 1966. Under the British colonial government, sugar and bauxite developed as the main industries under foreign monopolistic arrangement. Second, governance problems were more erratic than was foreseen. Third, under colonialism, Guyana was not integrated into the Caribbean community and the rest of the world as a free market economy.

Dr. CheddiJagan was assimilating the political consequences of these model at that time. Entering the political scene in the 1940s, he sounded the bell for corporate institutions. Jagan made four points. (1). Consumers will buy only those things which have definite *use value*. (2). Advertising that is useless will be greatly eliminated. (3). The real income of low income groups will be greatly increased. (4). Consumers will become better citizens. (Jagan 1945). The cooperatives will be structured as follows:

> "One or more consumer cooperatives can be organized in every village and sugar estate. Fifty, one hundred or more members can get together and collect shares for membership of $5.00 or $10.00 per shares. Those person having more money to invest can buy several shares keeping in mind however, that no matter how many shares held they will have only one vote per member. These shares will yield a fixed rate of interest but will not share in dividends. A member will receive profits only on the basis of his purchases from the store. This will necessitate an efficient book keeping system with regular reports to members. There may be some person who are willing to become members but do not have the necessary amount to purchase a share. This can be overcome by letting the dividends of those persons accumulate until the necessary amount is reached. Credit, if needed, can be obtained by cooperative, credit banks or unions.

True cooperation, whether consumer or producer, can enhance the welfare of the group. It embraces the principle of "live and lets live". It leads to a fuller and free life." (Ibid)

In another publication, Jagan explained his view of the state of development of Guiana.

> "… let us take a look at British Guiana. Our standard of living must be necessarily low because firstly, our productive capacity is restricted either by antiquated methods of production or by the production of only raw materials; and secondly, because distribution is so constituted that the average worker-consumer has to pay large profits to a whole series of middlemen. Not until we embark on a well-planned, collective industrial company can we get "out of the rut."

This of course presupposes control of government machinery of the people, by the people and for the people.

> Let us take bauxite for example. Had British Guiana been independent and further had it been federated to Dutch Guiana, we could easily have become a productive center for finished aluminum and its products. That industry alone could have given adequate employment to Guianese and materially raised the standard of living. Instead, our government is merely content in allowing the Canadians to scratch the surface of the earth with a handful of Guianese labour." (Jagan, *Indian Opinion*, 1945.)

With regard to the labor problem, Jagan called for a Minimum Wage Law. *The Labour Advocate,* Georgetown, Sunday, June 30, 1946) He compared the low wage of 4 ½ cents to the 65 cents per hour minimum wage in USA. He advocated for a raise in Guyana minimum wage to about 25 cents.

2. An Analytic Network Process (ANP) Model of the 1962 Budget Problems.

One needs a model that can incorporatethe state of such skeptical view in for the development of Guyana in the early 1960s. We explore these states of affairs using an ANP model that is capable of presenting Geopolitical, Aggregate demand, Aggregate supply, and time forecast in a judgmental setting. (Saaty 2005) Geopolitical is a critical concept to capture "…relationship between geography and military strategy, national development, expansion, and imperialism. In the 1930s, geopolitics also became associated with power politic". (Child 1979, p. 89; Anderson 1984, p. 2)

2.1 Geopolitical Contexts

Thomas Saaty's model associates the Geopolitical Context with "…the likelihood of changes in major international political relationships and major international economic relationships as the principal subfactors." (Saaty 2005, p 87) Underdevelopment growth theories have two political orientations, capitalism vs. socialism. The latter takes on state intervention, where state is used in the broad sense to include "all organized interferences with the market forces. (Myrdal 1971, p. 42) One finds states involvement in common activities such as road building and technical process enhancement. (ibid, p. 44). The drive for equality come mainly from national parliaments. One also finds state involvement in major activities in regards to medical facilities, sanitation, and education. (Ibid., p. 45) Social security reforms and progressive taxation have been used for equality purposes. (ibid., p. 46)

Geopolitical contest becomes important when one realize that "Capital is a necessary but not a sufficient condition for progress." (Nurkse1967, p. 1) On reads

in Angus Maddison work that "Improvements are brought about by a widely diffused international process and there is little that any one country can do to accelerate this." (Maddison 1967, p. 87) A somewhat more controversial view is by G. Myrdal who expresses doubt about whether the Industrial Revolution would have happened under democratic values because capital accumulation greatly dependent of wages people went without. (Myrdal 1971, p. 46)

The geographic conditions of Guyana is not favorable for development. Guyana needs heavy investment in infrastructure to initiate growth. As a demographic expert puts it:

> The failure of extended economic development is related to the difficulties of topography, the deficiencies in soils, and a general overabundance of water. There is a fertile coastal belt ranging in depth from 10 to 30 miles or more, much of it below high water level. The area back of the coastal ribbon tends to be swampy and soils are often sterile. Rising plateaus and mountains cover most of the colony; over four-fifths of the total area is in dense tropical forest. There is some savannah and there are stream valleys, but the areas most suitable for habitation lie in the remote interior. There are four great rivers and numerous tributaries and lesser streams, but falls and rapids prevent navigation from the coast to the interior. (Taeuber 1952, p. 4)

Nevertheless, development was found to be financially feasible. An early observation stated that "When these lands are drained, banked, and cultivated, they consolidate and become fully a foot below it. It requires, therefore, unremitting attention to the dams and sluices, to keep out the sea, one inundation of which destroys a sugar-estate for 18 months, and a coffee one for six years. *The original cost of damming and cultivating is fully paid by the first crop*, and the duration of the crops is from 30 to 50 years; so that, though great capital is required for the first outlay, the comparative expense of cultivation is a mere trifle compared with that of the [West Indian] islands". (Gray, 1852, p. 229) [Italics added]

One has to rate the factors using and "Intensity of Importance" scale of 1 to 9. (Saaty 2005, p. 7) for ANP analysis. The following list are the subject inputs needed to get a rating of the development program. The number at the end give the scale in absolute numbers and the main influence on the scores.

2.2 Geopolitical Inputs with Aggregate Demand and Supply Factors.

- 1 Primary Factors: These are the primary factors that drove the US economy in the early 1960's.
  - Aggregate Demand, Aggregate Supply, and Geopolitical Context.
- 2 Aggregate Demand Factors:
  - 1 Consumption: Guyana Consumption-- 7 & 8.
  - 2 Exports: *Guyana Exports—*8 for wanting to continue 80% of GDP exports.
  - 3 Investment: Investment in Guyana—3 &4 for stressing domestic I.
  - 4 Confidence: The confidence of the Guyanese consumer—1 for significant changes.
  - 5 Fiscal Policy: Fiscal Policy followed by the Guyana government—1 for redistribution policy that makes consumers happy, and producer dissatisfied. The plan has too much uncertainty.
  - 6 Monetary Policy: The Monetary policy of the Federal Reserve Board of the U.S.
  - 7 Expectations: With regard to the future course of fiscal policy, monetary policy, price inflation and interest rates—1 for reliance on borrowing, disappointment from the Kennedy administration.
- 3 Aggregate Supply Factors:

o1 Labor Costs: Wage Rates and Productivity Growth—1 &2 because unions (TUC) wans higher wages, and production need more capital.

o2 Natural Resource Costs: Primarily Energy Costs and secondarily material costs—1 & 2 because energy and material costs are high; hydro alternative are not very feasible because of too many peaks at falls.

o3 Expectations: Expectations with regard to future inflation and future nominal and real interest rates—1 because not much certainty in the information set.

- 4 Geopolitical Contexts: What kind of world are we living in?

o1 Major International Political Relationships—1 because of the prime minister stated concerns for cooperative and socialist views.

o2 Major International Economic Relationships. 1 because of struggle for independence from Britain was gaining momentum.

- 4Alternatives: These are the various adjustment periods examined for economic turnaround. We intend to predict the most likely time to turnaround.

o1 1962:Budget is presented. No change expected.

o2 1963:Budget in process.

o3 1964: 12 months for change to occur.

o4 1965: 24 months for change to occur

The ANP model integrated these scores into a super matrix. The model compares the scores in a pairwise ways, which enables a ranking of them. From the ranking, weight are computed for entry into a super matrix.The super matrix can then be raise to powers for convergence.

Priorities for the time periods are then calculated for the years 1962, 1963, 1964, 1965. As the results in Table 5 below shows, 1962 turned out to be the best year in the forecast period. The economy when into a tail-spin in 1963, starting with the Black Friday incident that followed the presentation of the 1962 budget. A modified budget came into vogue, which started the turnaround in 1965.

Table 5.

Graphic	Alternatives	Total	Normal	Ideal	Ranking
■	1 1962	0.0803	0.2409	0.7635	2
■	2 1963	0.0724	0.2173	0.6889	4
■	3 1964	0.0754	0.2263	0.7174	3
■	4 1965	0.1052	0.3155	1.0000	1

3. Lewis'sSeven-Year plan: 1966-1972.

British Guiana became an independent British colony in 1966. A plan, focusing on infrastructure development was developed by Sir W. A. Lewis and other. (Lewis, 1966b). The Lewis plan appeared very comprehensive, honest, and realistic. To quote the plan, "It is necessary to find out by investigation what are our need, what resources we have, what skills and machinery we need, what amounts of capital can be raised or borrowed, what new industries could be stated and where they can be best sited, and so on." (Lewis, 1966b, p. 4)

The envisioned that Guyana can raise $G295M to be spent over seven years 1966-1972. The source of funds is basically $G195m in soft and hard loans, and $G100M in gifts from abroad. Table 6 below shows the some data we have used to analyze the Lewis plan. The first column is the infrastructure that are targeted for

investment. The next column is the dollar (GUY$M) of planned infrastructure expenditure. We have included another measure of input to capture labor resources available. Two output columns are the corresponding GDP values for the industry that will primarily be impacted from the Lewis plan. On output data is form Kundu's 1959 input output tables for Guyana, and the other is our Input output forecast for those 1959 given in Table 4 above:

Table 6: *Data to Assess Lewis's Plan*

1	2	3	4	5	6	7
Description of Infrastructure Type	1966-72 Lewis Plan GM$	1965: Pct. Of LF Employed	1959 GDP Ind. GM$	Forecasted 1959 GDP GM$	Impacted Industries	DEA Scores PCT.
Capital to Industries	12	24	412.5	417.0	Manufacturing	100*
Drainage and Irrigation	40	32	79.1	79.1	Agriculture	14.4
Electricity	4	19.9	16.74	17.79	Power	10.9
Roads	16.4	20	70.6	70.8	Construction	20.5***
Georgetown Roads	1	20	70.6	70.8	Construction	100*
Railroad Improvements	2	20	25.6	36.6	Trans. &Com.	36.0**
Berbice Harbor	8	20	25.6	36.6	Trans. &Com.	12.8
Air survey	3	27.3	46.53	48.18	Mine & Hydro	32.8**
Vocational Training	1.8	19.9	24.2	25.04	Professional	26.3***
Health/Hosp. Centers	14	19.9	24.2	25.04	Professional	7.2
Riot Displacement expenditures	0.1	19.9	7.3	7.41	Dwellings	100*
Defense and Military forces	13	19.9	44.8	46.45	Government	13.4

Sources: Col.2: A. Lewis and other, "The ABC of the Development Programme 1966-1972, (Georgetown, Guyana: A Guyana Information Service Publications), pp. 3-55; Col 3: M. K. Bacchus, "Education for Development and Underdevelopment: Guyana's Educational System and its Implications for the Third World," (Ontario, Canada: Wilfrid Laurier University Press, 1980), Table 7. p. 39. Cols. 4 & 5: see Table 4. Col. 6: Author's judgment. Col. 6. DEA Estimates using Banxia Frontier Software & GAMS Software.

Data Envelop Analysis (DEA)that can be traced to Gerard Debreu (1950) and others, reveals that three infrastructure investments are optimal as indicated by their 100 percent scores. DEA analysis basically compares a state of output (z^0) with the output of the competitive state (z). In a minimizing problem, z^0 is not on the isoquant, implying some dead weight loss. (Ibid., p. 41). The equilibrium price,P, time the distance, namely $P.(z^0 - z)$is a coefficient measuring such a dead weight loss. In our case, capital investment for industries is relatively efficient, along with necessary repairs in Georgetown for damages consequent to the Black Friday riots.

The next planned infrastructure investment in close proximity to the efficiency frontier are RR improvements and Air Surveys. As it turned out, railway expenditure would not be lasting, as it was put out of operation once roads were

constructed. Air Surveys was a more significant investment. It was intended to map the interior of country to enabling exploration of mineral deposits, and spot sites for hydro-electric power generation. Although earlier attempts started in 1949 had mapped approximately 80 percent of the countries areas, those maps were found unsuitable for those purposes. Roads and vocational training occupied the third distance away from the frontier. D&I and Defense are not as important as expected.

3.1 Aftermath of the Lewis Plan

The Lewis plan appears as a new beginning for development of Guyana after its independence in 1966. It appeared short-sighted, however, as Guyana became a Corporate Government in 1975. Cooperative government lasted into the 1989, when a market economy program, theEconomic Recovery Program (ERP) that was launched. A new path to development emphasizing the external sector, benefited from a flexible exchange rate policy that started in 1991, and successive attempts at debt reduction. (Egoume-Bossogo et al., 2003)

The starred-cross corporate governance experiment interfered with the basic structure of the economy that traditionally, allowed exports of sugar, gold, bauxite, rice and other products. A brief tour of those industries that characterize Guyana industrial base is now in order.

3.1.1. Sugar Industry

The*Guyana Sugar Corporation* (GuySuCo) was formed in 1976, when the government of Guyana nationalized and merged the sugar estates operated by Booker Sugar Estates Limited, remains as a government run enterprise. As of 2014, attempt to technologize the industry by expanding its Skeldon plant met with many setbacks, putting the company badly off its target production.

3.1.2. Rice Industry

During the corporate government period, the government took control of the Guyana Rice Board (GRB) and created many sub-agencies such as the National Paddy and Rice Grading Centre (NPRGC) that governed paddy and rice grading; the Guyana Rice Export Board (GREB) that did exporting, and the Guyana Rice Marketing and Milling Authority (GRMMA), which owned all the rice factories. But rice production plummeted. The inversion of corporate governance in 1992, resuscitated the industry, by merging those sub-agencies, and investing heavily into drainage and irrigation systems.

One reason for having a government agency was to stabilize prices. Another was that the government can do better marketing abroad. In 2012 approximately 66 percent of exports were redirected from the Caribbean and European markets towards the oil rich Venezuela that can pay a higher prices. There also appears to be a forced saving policy intact, where rice paddy from private farms, averaging about 7 acres per family, were milled and channeled to the *Rice Marketing Board*. Families can keep only on bag (180 lbs.) per month.

3.1.3.Bauxite Industry

Bauxite mining in Guyana once attracted big names companies such the Aluminum Company of America (Alcoa) that incorporated the Demetria Bauxite Company (DEMBA). In 1929 Alcoa handed over the operations to its Canadian associate, Alcan, which resulted in Guyana becoming the world's third largest bauxite producer after the USA and Surinam. Demand for bauxite fell during the Great Depression Era, but picked up again after WWII. The Berbice Bauxite Company, a subsidiary of American Cyanamid, started production of chemical grade bauxite for the manufacture of alum at Kwakwani up the Berbice River in 1942. In 1943 DEMBA extended its operations to Ituni, about 35 miles south of Mackenzie, and by the end of the decade Guyana was the world's second largest producer, accounting for 17 percent of world production.

In 1952 Reynolds Metals acquired the Berbice Bauxite Company and started production of metallurgical bauxite at Kwakwani where a small settlement of workers developed. At around the same time DEMBA expanded production of refractory grade and abrasive grade bauxite at Mackenzie, making Guyana the world's most diversified bauxite producer. In 1956 DEMBA started construction of the alumina refinery which began production in 1961.

The Government nationalized Bauxite production in the 1970s. Production was now run by the Guyana Mining Enterprise Limited (Guymine). In ten years, bauxite production was cut by half. It single alumina plant in Linden was closed in 1982. Meanwhile, China form 1981, started to export processed calcined bauxite, and dominated the world market.

The Reynolds Bauxite Company and Alcan were invited back, along with some other-- Venezuela's Venalumcompany, Norway's Norsk Hydro. Now, Guymine is split into two companies—Bermine and Linmine.

3.1.4. Mining Industry

Gold in Guyana was once tied up with the Sir Walter Raleigh's myth of Eldorado's Gold. Another exploration boomed in the 1980s. Canada's Golden Star Resources and Placer Dome, and Brazil's Paranapanema, Australia's Giant Resources, Homestake Mining of the United States, and Britain's Robertson Group were exploring gold production in Guyana,. The Guyana Geology and Mines Commission hosted potential investors' visits to the country, and the government promised to pay the market value for gold (US$356 per ounce in May 1991) in United States dollars. The government's promise achieved measurable results in 1990: during the first half of the year, declarations increased by 75 percent over the previous year.

Diamond production in Guyana is more sketchy because the bulk of the mineral was reportedly smuggled out of the country. Declared production fluctuated between 4,000 and 12,000 carats per year in the 1980s. Undeclared production was probably much higher. In 1966, the industry produced about 92,000 carats, 60 percent of which were reported as gem quality.

4. Development Plans from 1972 – 1984

Real GDP growth rates were very volatile during this period—a dip in 1970-1972, a strong recovery during 1972-1976, dipping again during 1976-1978, a small recovery during 1878-1980, and then the worst dipsince the 1960s during the 1980-1984 period. The performance in 1982 can be thought of as a year of economic collapse.

At the head of period was embedded a UN Development Program Assistance effort for 1972 – 1976. It was in the form of a Country proposal for United Nations Development Programme assistance, 1972-1976. The plan targeted $5M USD but expected $15.8M as input from UNDP. Approximately 75 percent of the funds were planned for natural resources and infrastructure development. (Guyana 1973, p. i).
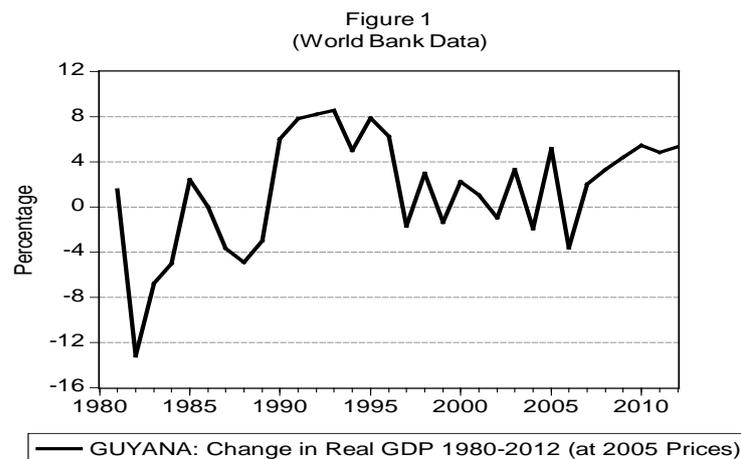
The activities of the plan includes a study for the location of a deep sea harbor, hydro-electric power survey, transport projects, the construction of a building for a Cartography project estimated at $500,000 USD, a study for a fishery complex, and a curriculum development project. These are deemed as "large-scale projects which the Government feels only UNDP can appropriately undertake." (Ibid, pp. ii)

Besides the UNDP inputs, several other development programs were identified as self-reliance projects. The plan listed 8 problems and proposed a change in regime to solve them. The problems are 1. Dependence on a narrow production base, 2. Small number of manufacturing industries, 3. Unskilled labor, 4. Low level

of technology, 5. Lack of surplus in the agriculture sector, 6. Labor conflicts, 7. Lack of management for economic growth, and 8. Underutilization of domestic resources. The one solution proposed was a "cooperative" from of government. (ibid, pp. 5-6).

The period 1972 – 1976 witnessed decline in average annual growth rates for the industries that were put on self-reliance.The average annual negative growth (in bracket) for the period were estimated as follows: One the farming side, they include sugar (6.5 %), rice (12.6 %) other crops (15.8%), livestock (4.1 %). On the manufacturing side, they incude sugar (4.6%), rice (26.1%), Other food and tobacco (8 5), and Other manufacturing including power (15%). (Greene 1974, p. 191)

From 1978 to1981: After the lapse of two years, a new plan evolved targeting a high GDP and Saving growth rates for the next four years at the levels of 17, and 16 percent respectively. The end of 1978 witnessed over 20 percent inflation rate and mounting arrears in external debt. An Extended Fund Facility (EFF)by the IMF made funds available by mid-1979 for growth and BOP relief. (Kayum, 1991, p. 102). Economic conditions worsen however, and only started to improve around 1982 via an alternative IMF plan in 1979, and a three year structural adjustment program with the World Bank in 1981. Figure 1 below shows the cycles for the period. The big dip in 1982 due mainly to strikes and shortages, a period of strong growth initiated by the 1989 Economic Recovery Program, and political unrest from 1998 to 2005, where 2005 marks a flooding disaster.

Figure 1
(World Bank Data)

GUYANA: Change in Real GDP 1980-2012 (at 2005 Prices)

5. Lowe's Sectorial Model for the 1970-1984 period.

To be just about the period, one need to do an appraisal that includes the socialist policy of the time, and the underlying transition away from capitalism. Adolph Lowe has presented such a model. Building on Marx two sector model with a capital and consumption department, Lowe split the capital sector into Ia and Ib. Subsector Ia produces equipment to be used as inputs into both sectors Ia and Ib, but subsector Ib supplies only a consumption sector II. (Lowe 1976, p. 31).

Lowe defined capital-output net of depreciation as kd and proceeded to express all stock an flows in station equilibrium as multiples of kd and $1 - kd$." (Lowe 1976, p. 45) Total output for the three sectors is o; $k = Fd/o$, and the sectors Ia and Ib produce the out of capital $Iao + Ibo = okd$. The set up of the model is therefore:

Output of Sector II $= o - (Iao + Ibo) = o - okd = o(1 - kd)$

Output of Sector Ib is the depreciated capital going to Sector II $= o(1 - kd)kd$

Output of Sector Ia $= o - o(1 - kd) - o(1 - kd)kd = o(1 - 1 + kd - kd + (kd * dk) = o(kd)^2$

We set up the output for each sector using the ratio of 1 to 4, for a unit of output o =1. First we input a value for k and d. If $k = 2$, and $d = 1 percent$, then $kd = 2 * .1 = .2$, and the coefficient for Sector II will be $1 - kd = 1 - 0.2 = .8$. By a similar analysis, we find the output coefficient to be 0.04 for Ia, and 0.16 for Ib. This preserve the ratio is 1:4 for the sectors, namely: $0.4 : 0.16 : \sqrt[2]{0.16^2}$

With hindsight of employment data, we can better calibrate the model for the Guyana Economy. To do that, we used the labor force number of 263,467 in 2006 (Guyana 2011, p. 6) and the World Bank real GDP data of 291,964 G$M for the value of k. The value of k turned out to be approximately one, which is consistent with the idea that the developing economy is starve for capital with respect to developed ones. For the year 1970, we can have a simulated view of capital, labor, and output using the above ratios. Table 7 shows this information.

Table 7: *Lowe's Three Sectors Model of Guyana for 2006*

	F	f	n	O
Ia	2,715	271	2,510	2,781
Ib	25,099	2,510	23,205	25,715
II	257,154	25,715	237,752	263,467
Sum	284,968	28,497	263,467	291,964

Source: Lowe's initial model calibrated for 2006 employment data.

We can use an application in Lowe's instrumental sense to see how much investment in the machine Sector Ia is necessary to attain the full potential GDP. For this we need potential GDP data which is not available. One can back into such an estimate by using the Okun'slaw. Author M. Okun stated that the easiest was to get the needed coefficient is to regresspercentage point changes the unemployment rate on changes in real GDP. (Okun 1962, p. 9) While the World Bank provides these data for 1991 to 2007, currently, Official Unemployment rates are available for the years 1970 (15.4), 1980 (16.8), 1986 (12.9) for the 1970-1984 time period. We can use those official Guyana Bureau of Census data, prorating uniformly for the missing years, and regress them on real GDP data with base year 1990 as provide in Gafar. (Gafar 2003, pp. 58-59) The result is the equation: $\Delta Unrate = -0.136(t = -2.6) + 1.59(t = 1.72)\Delta GDP$, which are 99 and 90 percent significant, respectively, but with a poor $R^2 = = .09$. From this regression we can make estimates of the potential output, gap estimates, and show what the short fall for capital sector Ia. Table 8 below displays the results:

Table 8: *GDP Gap and Sector Ia Performance in Guyana 1972-1984*

Year	Actual Real GDP	Natural MillionG$	Ia Actual Inv. Mach.	Ia Natural Inv. Mach.	Natural -Actual	WIP Actual GDP	WIP Nat. GDP	**Net WIP**
1972	19,872	23,800	189	227	37	1,987	2,380	393
1973	20,213	23,331	193	222	30	2,021	2,333	312
1974	21,626	23,732	206	226	20	2,163	2,373	211

1975	23,880	25,391	227	242	14	2,388	2,539	151
1976	24,579	28,037	234	267	33	2,458	2,804	346
1977	23,403	28,858	223	275	52	2,340	2,886	545
1978	22,998	27,477	219	262	43	2,300	2,748	448
1979	20,311	27,001	193	257	64	2,031	2,700	669
1980	20,644	23,847	197	227	31	2,064	2,385	320
1981	20,581	13,946	196	133	(63)	2,058	1,395	-663
1982	18,438	13,903	176	132	(43)	1,844	1,390	-453
1983	16,731	12,456	159	119	(41)	1,673	1,246	-428
1984	17,085	11,303	163	108	(55)	1,709	1,130	-578

Sources: Real GDP 1990=100 (Gafar 2003, p. 58-59); GDP gap (Estimate using Okun Gap rule); Sector Ia estimate (Lowe 1995 model).

5.1 Results of Lowe's Sectorial Model

This analysis probed results based on what fixed coefficients implies for the industrialization process. Regarding the ratio of consumption goods to capital goods, we follow the empirical findings of Walter G. Hoffmann (1958) application of Lowe's model to the processes of economic development. Hoffmann purpose was to show "… predominantly agricultural economy becomes industrialized." (Ibid., 1958, p. xii) He specified consumption-goods-output to capital-goods for different stages of the industrialized process. The ratio moves from 5:1, to 2.5:1, to 1:1, over early to latter stages. In the latter stage, there is a continuing tendency for the output of the capital sector to be greater than the output for the consumption sector. Using Lowe's Output capital ratio of 5 as stipulated above, brings the ratio of output between the sectors to the final stage of the development process of 1:1 in line with Hoffmann's findings.

Looking at the hypothesis that the Machine Sector Ia is the driver of the Guyana economy, the four years, 1972 to 1976, shows the closes distance between the actual and potential GDP. Around 1979, the average gap was doubled. From 1981 – 1984, the economy potential collapsed as indicated by the negative values in the output columns.

A perversion of the decline is highlighted in by the decline in Work-in-progress (WIP) estimates, amounting to about 10 percent of decline in GDP. WIP or Unfinished goods become finished in stages, for which a uniform density of completion is assumed. The parameters of such a density function are the maturation period, and the period of observation of the flow of inputs and outputs. The uniform density function, say W = .5 acts as a growth factor for the output. Taking half of the output columns will yield .02, .08, and .4, respectively of the sectors. WIP therefore, enhances the calculated output by those percent of output. But in this case, the proportion of output and working capital remains proportional over the sectors.

6. Latter Part of the 20th Century

During this period, the focus was on economic stability. From 1981 to 1984, massive layoff in employment had happened, coupled with deficit reduction plans. Economic collapse stimulated activities in the inform sector. From 1984 to 1986 growth was flat, but with a strong decline up to 1989. At that time an Economic Recovery Program (ERP) kicked in and made a big recovery from the trough of 1989 to 1998.

According to a World Bank Study "By 1988, output was only 68% of the 1976 level. After the devaluation of 1989, total debt was over 600% of GDP. The severe decline in real wages and living standards let to a major migration of talented Guyanese to jobs abroad." Emphasis was placed on the rebuilding of the sugar and bauxite industries, and some public infrastructure including "the sea wall, the power sector, water supply, and the road system." (World Bank1993, pp. xi- xii)

A paradigm shift in regime took place. The market mechanism were first put in place, followed by a mixture of Fiscal, Monetary, Exchange and Government policies to combat the varied problems of mounting debt, high inflation, and rigid prices. Policy measures seems to have three goals—low debts, low inflation, and increase revenues, which were handled by flexible exchange rates, tighter money supply, and improvement in tax administrations, namely $Lowdebt = E(exchangerates)$, $Inflation = M(moneysupply)$, $and Revenues = R(improvetaxadmin)$.

An econometric study for the period summarized the effect this way: **"Fiscal policy** focused on reducing the prevailing large fiscal deficits, which had resulted in an unsustainable public sector debt. Structural reforms in the public sector (i) improved tax collection through streamlining the tax system and better tax administration; (ii) restrained expenditures; (iii) fostered the business environment through price liberalization, and regulatory and land reform; (iv) reduced the size and cost of the civil service and made it function more efficiently; and (v) privatized most public enterprises… Exchange rate policy contributed to the successful adjustment process in Guyana initially through devaluations and beginning in 1991 through a flexible exchange rate regime. The weaker Guyana dollar helped make the economy more competitive, encouraged private investment, and provided incentives to export. Also, restrictions to current and capital account transactions were lifted… tighter monetary policy led to a decline in inflation, buildup of gross international reserves, stabilization of the exchange rate after floating, and increased credit to the private sector. Monetary authorities were given greater autonomy to conduct monetary policy and regulate and supervise the financial system. They developed more and better instruments of monetary policy and enhanced prudential regulations and their supervisory capacity. Moreover, the privatization of several financial institutions and the entry of new private banks increased competition in and the efficiency of the banking sector. In the wake of the financial sector reforms during the 1990s, financial intermediation recovered as real money demand increased and interest rate spreads began to decline." (Egoumé-Bossogoet, al., 2003).

6.1. Drivers for future Economic Growth

Categorically speaking, one looks for objectives and direction for the new policy regime. The objectives are Flexibility, Allocation, Mobility, Industry and Natural Resources, External relations. The new policies are flexible in the sense of progressive movements form rigid control to more flexible approach to government. But the government can be more flexible? Flexibility also involved the disregard for oversimplified ratios such as fixed factor proportion, fixed coefficient, or fixed K/O or K/L ratios. About allocations, you cannot allocate what you do not have. Resources are pre-committed, being developed, and available now and so the focus should be on growth to provide surpluses to allocate. Some say that a critical concern of mobility is to mobilize the approximately 50 percent of population that is idled abroad with due considerations of keeping remittance flowing in. The industrial base of Guyana has not changed much. Rice, sugar, bauxite exports had been the traditional economic base. The bauxite industry is now facing stiff completion from abroad, for instance from the

new player in the global economy, China. The external sector has become a source of new and affordable technology that replace old production methods with one offering increasing returns.

Guyana best prospect seems to be long-term planning. Its transition from an agricultural to an industrial stage is incomplete. The major drag in the process is capital formation. While the high tech revolution has made capital affordable, capital did not diffuse rapidly and uniformly in Guyana. Perhaps the main reason is the country's weak Human Capital base. First it was losing population when the high tech revolution started. Second the labor force we can use that term was not highly educated.

The 2010 National Development Strategy (NDS)states "Except for education and training to improve the quality of the labor force, capital formation is the most basic factor in the process of economic development. " (NDS Section 4.II.3.1) On the first emphasis, now discussed under the category of human capital usually means education and on the job training, but we also note that "human capital takes many forms, including skills and abilities, personality, appearance, reputation, and appropriate credentials". (Becker 1993, p. 262) It must be stressed that "much research demonstrates that investments during childhood are crucial for later development… also that the total amount of human capital accumulated… is proportional to the amount accumulated during childhood. (Ibid)

6.2. Unique Problems with Capital and Labor

Guyana suffers the plight of capital shortage like most developing countries. A necessary condition for growth is accumulation of capital. Using Gross domestic Investment as a percentage to GDP in current local units, Table 5 displays Guyana *I/Y* ratio for 1960 to 2013.

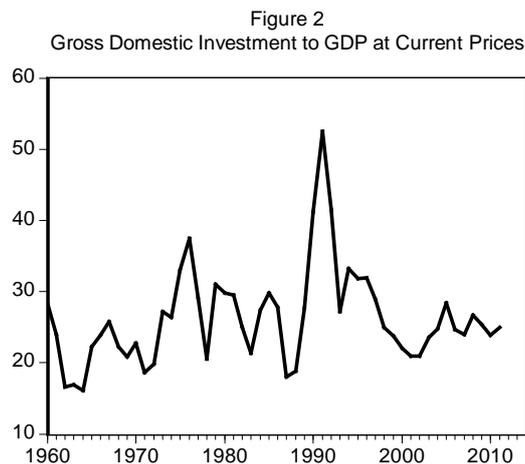**Table 9.** *Gross Domestic Investment to GDP at Current Prices*

1960	28.25	1986	27.80
1961	23.98	1987	18.03
1962	16.64	1988	18.87
1963	16.89	1989	27.71
1964	16.05	1990	41.16
1965	22.25	1991	52.49
1966	23.87	1992	41.51
1967	25.82	1993	27.22
1968	22.26	1994	33.23
1969	20.82	1995	31.86
1970	22.74	1996	31.89
1971	18.63	1997	28.92
1972	19.85	1998	25.00
1973	27.21	1999	23.78
1974	26.41	2000	22.06
1975	33.06	2001	20.97
1976	37.42	2002	20.98
1977	29.06	2003	23.60
1978	20.51	2004	24.78
1979	31.00	2005	28.37

1980	29.77	2006	24.67
1981	29.49	2007	23.95
1982	24.97	2008	26.64
1983	21.39	2009	25.40
1984	27.42	2010	23.88
1985	29.85	2011	24.92

Sources: 1960-1979: Central Bank of Guyana, Annual Reports & Kayum 2001, p. 80. 1980-2011: World Development Indicator.

One can begin to understand the cyclical properties of the I/Y series by a plot as show in Figure 2.We will treat the plot as a time signal, $x(t)$. The signal does not show much of a trend, but displays cyclical movements over different periods. The data is annual, and short cycles seem to occur approximately every 5 years. The plot seems to have some regular and some irregular pattern. This is usually a good fit for spectral analysis, testing whether peaks and troughs appear at approximate n-year intervals, or Cycles of exactly n years in length recur consistently in the series. (Percival 1975)

Figure 2
Gross Domestic Investment to GDP at Current Prices

The time signal, x(t) reflects that Investment generates income and creates capacity. If σ is the potential increase in capacity, and α is the marginal propensity to save, then growth in investment is $= I_0 e^{\alpha \sigma t}$. (Domar 1957 pp. 73-74) The equilibrium growth formula under the names of Harrod-Domaris $I/Y = \alpha$.One can read many implications of this formulate for Guyana's development.

One big implication is in regards to the saving ratio. According to Sen, "the optimum size of total savings and that of the optimum capital-intensity or investment are interdependent problems." (Sen 1968, p. xiii) Maurice Dobb reads into the growth formula that only the lowest capital-output ratio is consistent with maximizing the growth rate. (Dobb 1960, p. 33) A justification is given bythe factor proportion theory, which hold that the relatively scarce factor should be economized.

W. W. Rostow envisioned that the rate of investment should exceed the rate of population growth during the take-off stage of growth. (Rostow 1960, p. 21) He spoke of a rate of 10 percent of national income that would require "…modern science and useful cost-reducing inventions." (Ibid, p. 23) The IMF reported private, public, and foreign investment rates as a percent of market price GDP

approximating 32 to 42 percent from 1991 to1995, and 23 to 30 percent from 1996 to 2000, which would place Guyana in the transition state of industrialization. (IMP Staff Country Report No. 98/13, February 1998, Table 6, p. 11; Report No. 01/01, January 2001, Table 5, p. 9)

In his Nobel laureate speech in 1977, John Hicks has thoroughly explored the need for I/Y in regards to growth. Growth requires some capital intensity. If it is true that the marginal product of labor is zero in underdeveloped counties, then capital-intensity is necessary. For him technology and capital intensiveness are impulses: "It is more instructive to think of each invention as setting up what might be called an 'Impulse'—which, if it were not succeeded by other Impulses, would peter out. Ricardo's theory is a theory of the working of the individual Impulse." (Hicks 1983, p. 38)

The I/Y ratio has many implications for policies as well. Equation 1 below suggests that government can tax, T, income, and use the proceeds for capital formulation. (Arrow 1985, Vol.5, p. 226) Equation 1 uses Tax policy, T, to reach one goal, namely fixed savings, $s = S/Y$. Often a country would may tax concession to attract some investment. (Streeten1995, p. 95) One can distinguish between public and private capital formation as well. For instance, on can make private capital formation dependent on private savings, and public capital formation depends on taxation. In common practice, the latter is done via taxes and bond financing, B, so that the government will have to choose an optimal mix between T and B for equation 2 below.

$$\frac{I}{Y} = s \text{ or } I = \dot{K} = s(Y - T) = sY + (1 - s)T \tag{1}$$

$$I_{priv} = s(Y - T) - B; I_{Pub} = T + B \tag{2}$$

$$I_{priv} = s(Y - T) - B - eB^*; I_{Pub} = T + B + eB^* \tag{3}$$

A further extension would be to include the role of foreign debt, eB^* as in equation 3, where e is the local/foreign currency exchange rate.Figure 3 indicates the peak years of debt stock reduction in the case of Guyana for 1991, 1995, 1998, 2006. In 1998 Guyana was heavily indebted, paying about 45 percent of its revenues for debt service, which was about a half of what it way around 1992. Under the Heavily Indebted Poor Countries (HIPC) initiative, the IMF and World Bank agreed to reduce Guyana's external debt by approximately a quarter, US$253 million in Net Present Value (NPV) terms. This was estimated to translate into debt-service relief over time of close to US$500 million—US$35 M from The IMF, and US$27 million from the World Bank. (Press Release Number 97/64 December 23, 1997). The year 2007 was to witness debt cancellation under the multilateral debt relief programs of the IMF, and the Inter-American Development Bank. Figure 3 indicates thatGuyana's total external debt had a downward trend from 1990 to2008.

6.3 Spectral Analysis on I/Y

Spectral Analysis moves the analysis of the time signal from a time to a frequency domain. The series x(t) is fitted with many sine and cosine waves each with varying frequencies. The amplitudes are made random to approximate$x(t)$, and frequency vs. aptitude plots are made of the spectrum.

One fits a spectral density function on the series $x(t)$finding the probability that $x(t)$ lies in an interval $[x, x + \Delta x]$. (Bendat & Piersol 1968, p. 15)The idea is to identify large spikes at a frequency measured in cycles per year. At frequency less than a year may not be usefully since it may be linked to seasons, the calendar. Economists consider period of more than a year to be explained by business cycles.

Figure 3 shows how the distribution of the power-spectral density of x(t)for Guyana and four neighboring countries, distributed over the frequency axis labelled year/cycle. Eyeballing the plots reveals some fuzzy notions about the relationships among the country. A comparison of the series for Guyana with an aggregated one, $y(t)$, for the neighboring countries such as Trinidad and Tobago, Barbados, Honduras, and Venezuela is attempted. Five and Ten years peaks seem to be similar, but with some lags. Only Trinidad, Honduras and Venezuela show peaks with a 25 years cycle. All the countries seems to be heading to a longer peak cycle, except Trinidad alone. One may want to investigate whether the latter was a result of abandoning major sectors in favor of the oil sector.

Table 10 display cross-spectral and coherence analysis for the group of countries. Coherence of Guyana ranks highs with the average of the rest of the countries. Individually, Guyana coherence rate rank lowest with Barbados, almost equally with Trinidad and Venezuela, and higher with Honduras. Time series of other neighboring countries are not available for adequate samples size for other countries.
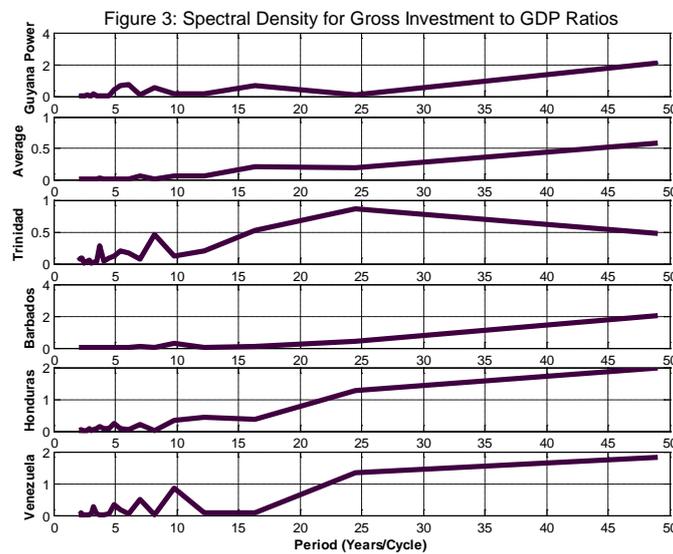

Figure 3: Spectral Density for Gross Investment to GDP Ratios

Table 10: Spectral Coherence Analysis

Mean of Specrum	Guyana vs, Average	Guyana vs, Trinidad	Guyana vs, Barbados	Guyana vs, Honduras	Guyana vs, Venezuela
Sxx	1.28E-08	1.28E-08	1.28E-08	1.28E-08	1.28E-08
Sqrt	0.00011	0.00011331	0.00011	0.000113	0.000113314
Syy	7.39E-09	9.21E-09	6.01E-09	9.25E-09	1.10E-08
Sqrt	8.6E-05	9.599E-05	7.8E-05	9.62E-05	0.000104776
Sxy	9.30E-09	1.00E-08	7.89E-09	1.03E-08	1.10E-08
Abs	9.3E-09	1.0019E-08	7.9E-09	1.03E-08	1.0963E-08
Coherence	0.95406	0.92112328	0.89834	0.943691	0.923390259

Notes: Sxx =Power Spectrum of Guyana
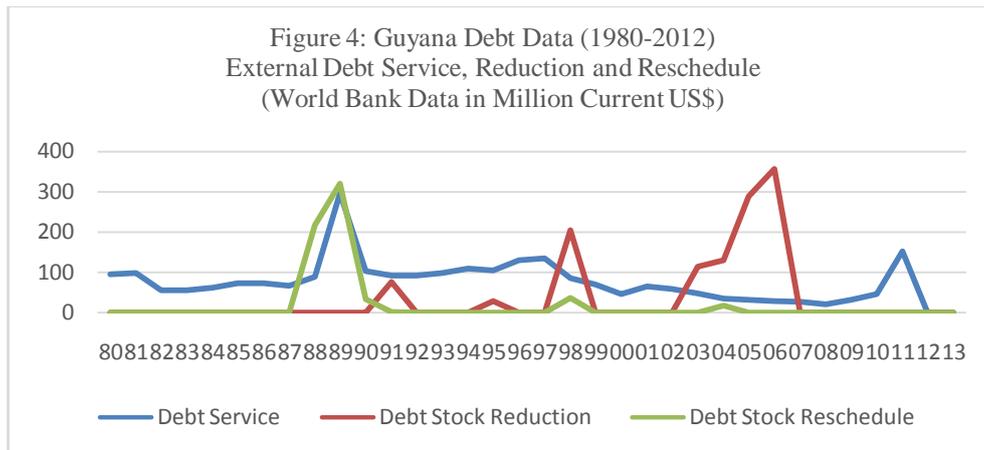Syy= {pwer Spectrum of another country or average of all others
Sxy=Cross-Spectral between x and y
Coherence = abs(Sxy)/ (sqrt(Sxx)*sqrt(Syy))

6.4 Debt and Debt Relief influences on Growth

Something must be said about the influence of debt relief on Guyana's I/Y ratio. Data for Guyana Debt are available for the 1980-2012 period. Figure 4 indicates the burden of debt service peaked around 1989, 1997, and 2011. The burden was relieved by debt stock reductions in 1991, 1995, 1998, and 2006. But again, it peaked in 2011, as though no lessons was learn from the reliefs.

Debt reliefs can make money available for investment, although some of it is tied to special projects. Guyana witnessed mountain foreign debt for various reasons-- thigh global capital markets, deterioration of a countries export revenues, domestic mismanagement, and contagion during the time-series period. (Dornbusch 1993, p. 8)

Figure 4: Guyana Debt Data (1980-2012)
External Debt Service, Reduction and Reschedule
(World Bank Data in Million Current US$)

6.5 Longer Term Population Conditions

At one time increasing population was thought bad for growth. Table 11 shows that except for the 1980s, population of Guyana grows at less than a percent annually. The old Malthusian view is that less population implies more food per person. A 20th century view is that more population requires more investment and growth in such capital as housing etc. A later 20th century view is that human capital in term of education, health, OJT, etc. is most important.

The size of net out-migration was approximately four times the size of net natural increase in population in the 1980s. Therates of outmigration, however, was cut by approximatle a half currently from its 1980 peak. According to the Nobel laureate V. S. Naipaul, people were leaving because of the hard economic times during the 1970s, and 1980s:

"At a time of plenty in neighboring Trinidad (because of the oil boomof the 1970s), Guyana was experiencing want. Guyanese began to leave, legally and illegally, Indians at first, and thenothers; they went to Trinidad and Canada and the United States. More than a third of the Guyanese population now lives abroad. (V. S. Naipaul, A Handful of Dust: Return to Guiana, *The New York Review of Books*, April 11, 1991 Issue) The outmigration continues to the present but for other reasons, mainly the lack of opportunities for work and education or as Adam Smith would say, the desire of people to better their conditions.

Table 11: *Percent Change in Population, NNI and NM per 1000 persons: Guyana*

Years	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989
Pct. PoP.	0.27	-0.16	-0.53	-0.79	-0.91	-0.91	-0.86	-0.78	-0.64	-0.46
NNI	9.23	9.15	9.10	9.07	9.07	9.10	9.23	9.32	9.40	9.47

NM			-84.98					-76.40			
Years	**1990**	**1991**	**1992**	**1993**	**1994**	**1995**	**1996**	**1997**	**1998**	**1999**
Pct. PoP.	-0.25	-0.03	0.14	0.25	0.32	0.37	0.44	0.47	0.48	0.46
NNI	9.52	9.56	9.56	9.55	9.51	9.45	9.38	9.30	9.22	9.11
NM		-46.48					-31.34			
Years	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**
Pct. PoP.	0.43	0.40	0.40	0.44	0.51	0.59	0.66	0.69	0.68	0.65
NNI	8.98	8.83	8.64	8.43	8.19	7.94	7.69	7.45	7.22	7.03
NM		-32.76					-32.76			
Years	**2010**	**2011**	**2012**							
Pct. PoP.	0.60	0.57	0.53							
NNI	6.877	6.764								
NM		-32.77								

Source: World Bank Data: WWW.Qandl.com/worlbank

In the milieu of the Hi-tech revolution, an NDS report emphasized that perception barriers are important for human capital improvement. This part of the report that drives home this emphasis states:

> "It is therefore incumbent on any Government of Guyana to avoid doing or saying anything, whether intentionally or not, which might discourage the process.
> 4.II.3.2 In this regard, perhaps the most fundamental constraint is that of perception. It appears that many local and foreign investors still remain unconvinced of the total commitment of the Government to the principles and practices of the free market. It is essential, therefore, that this perception be removed, and that steps be taken to ensure that this or any other government's dedication to a dominant role of the private sector, and to the necessity for private investment, be made abundantly clear.

Some further analysis of other concerns for Guyana's future growth pertains to 1. External Economies: the development of one industry or sector influences the development of the others. 2. Standard of Living, which depends on "capabilities" and "functionings" implying that one must be able to use resources to enhance well-being. People might not be aware that they have to make choices, and capability involves the ability to be"…nourished, healthy, educated, productive, fulfilled… income or goods they buy are only one type of instrument to achieve them." (Streeten1995, p. 51) In addition, "employment and earning opportunities are as important as growing more food." (ibid, p. 61) 3. Structural relation in production vs. income-expenditure balance. (Dobb 1960, p. 7) 4. Choice of Technique: Labor is cheap. MPL = 0, so that labor can be substituted without costs. (Sen 1968, p. 3; Nurkse1967, p. 33), and 4. Dynamics between Dual Sectors—agriculture with surplus labor and manufacturing that can absorb these labor.

7. Conclusion

In the west many places are dissert but lacking water does not prevent growth. In Guyana, a place of many waters, and natural resources, potential growth is promising. Both the socialists and capitalists aim is for industrialization to take place. From the point of view of Lowe model, as expanded by Hoffmann, a

transformation from agricultural to industrial sectorial growth has is promising. Perhaps there has been a time reversal, for while sugar and rice industries are still being developed, bauxite is facing more external competition. Restarting the clock around 1992 seems to have progressively throttledGuyana's growth.

The appraisal indicates that the visible hand does not demonstrate a benevolent dictator for Guyana. Burnham changing his allegiance from capitalism to socialism was disastrous; and Jaganmoving away from full bore socialism following the demise of the former Soviet Union in the 1992 followed seem to have placed Guyana on its long-term growth path. The invisible hand that bracket the first and last decades of the period has been the right method. The method that respects the elasticity of people'sexpectations, with stability theories grounded excess demand function that is pervaded with linear production processes, and elevates the market mechanism on a pedestal works best for Guyana.

Reference

Anderson, T. D. (1984).*Geopolitics of the Caribbean: Ministates in a Wider World*, (New York: Praeger).

Arrow, K. J. (1985). *Production and Capital, Collected Papers of Kenneth J. Arrow*, Volume 5, (Cambridge, Mass.: The Belknap Press of Harvard University Press).

Bendat, J. S., & Allan G. P. (1968). *Measurement and Analysis of Random Data*, (New York City, N. Y.: Joh Wiley and Sons).

Bhagwati, J. (1998). India's Development Strategy, in Isher Judge Ahluwalia and I M. D. Little, *India's Economic Reforms and Development*, Second Edition, (Oxford, U. K.), pp. 25-42.

Becker, G. (1993). *Human Capital: A Theoretical and Empirical Analysis with Special Reference to Education,* Third Edition, (Chicago, Ill.: The University of Chicago Press).

Child, J. (1979). Geopolitical Thinking in Latin America, *Latin American Research Review*, 14(2), 89-111.

Clark, E. H. et al. (1953). *The Economic-Development of British Guyana: IDBR* (Baltimore, MD: The John Hopkins Press).

Cohon, J. L. (2003). *Multiobjective Programming and Planning*, (Mineola, New York: Dover Publications, Inc.).

Dasgupta, P. (1993). *An Inquiry into Well-Being and Destitution*, (Oxford, U. K.: Clarendon Press).

Debrue, G. (1989).*The Coefficient of Resource Utilization*, represented in "Mathematical Economics: Twenty Papers of Gerard Debreu, (Cambridge, U. K.: Cambridge University Press, pp. 1989), pp. 30-58.

Desai, M. (1998). "Development Perspective: Was there an Alternative to Mahhalonobis?" in Isher Judge Ahluwalia and I M. D. Little, *India's Economic Reforms and Development,* Second Edition, (Oxford, U. K.), pp. 43-52.

Dobb, M. (1960). *An Essay on Economic Growth and Planning*, (New York City, N. Y: Monthly Review Press).

Domar, E. D. (1957). *Essays in the Theory of Economic Growth*, (Oxford, U. K.: Oxford University Press).

Dornbusch, R. (1993). *Stabilization, Debt, and Reform*, (Englewood Cliffs, N. J.: Prentice Hall).

Duesenberry, J. (1949). *Income, Savings and the Theory of Consumer Behavior*, (Cambridge, Mass.: Harvard University Press).

Egoume-Bossogo, P., Faal, E., Nallari, R., & Weisman, E. (2003). Edited, *Guyana: Experience with Macroeconomic Stabilization, Structural Adjustment, and Poverty Reduction*," (Washington, D. C.: IMF Media Service Division).

Gafar, J. (2003).*Guyana: From State Control to Free Market*, (New York: Nova Science Publishers, Inc.).

Greene, J. E. (1974). The Politics of Economic Planning in Guyana, *Social and Economic Studies*, 23(2), 186-203.

Grey, H. E. (1852). On the Population of the Colony of British Guiana, as Enumerated on the 31st of March, 1851.Being the Substance of a Despatch from Governor Barkly, presented to the Society of the Right Hon. Earl Grey, Her Majesty's late Secretary of State for the Colonies, *Journal of the Statistical Society of London*, 15(3), 228-249

Guyana. (2011). *Millennium Development Goals: Guyana Progress Report 2011*, Ministry of Finance, Government of Guyana, Georgetown, Guyana.

Guyana. (1973).*Ministry of Economic Development, Cooperative Republic of Guyana Country Programme Proposal for United Nations Development Programme Assistance 1972-1976,* Georgetown, Guyana, (March 1).

Hicks, J. (1983).*Classics and Moderns: Collected Essay on Economic theory, Volume III,* (Cambridge, Mass.: Harvard University Press).

Hoffmann, W. G. (1970). "Growth of Industrial Economies," *Hitotsubashi Journal of Economics.* (June), pp. 113-116.

Hoffmann, W. G. (1958). *Growth of Industrial Economies,* (Manchester, U. K.: Manchester University Press).

Jagan, C. (1945). "The Need for Consumers' Cooperatives,"*The Indian Opinion*, Saturday (June 2).

Kaldor, N. (1980).*Collected Economic Essays Volume 8: Report on Tax Taxation II, Reports to Foreign Government*, (New York: Holmes and Meier Publishers, Inc.), pp. 272-309.

Kantorovich, L. V. (1960). Mathematical Methods of Organizing and Planning Production, *Management Science*, 6(4), 366-422

Kendall, P. (2000). "Interest Rates, Savings and Growth in Guyana 1965-1995, *Economics and Programming Department, Caribbean Development Bank*, August 2000.http://www.caribank.org/uploads/publications-reports/staff-papers/INTEREST%20RATES,%20SAVINGS%20AND%20GROWTH%20IN%20GUYANA.pdf

Khayum, M. F. (1991). *Macroeconomic Modelling and Policy analysis for Less Developed Countries*, (Bolder, CO.: Westview Press).

Kundu, A. (1963). "Inter-Industry Table for The Economy of British Guiana, 1959 and National Accounts, 1957-60," *Social and Economic Studies*, Vol. 12, No. 1, (March), pp. 1-43.

Leontief, W. W. (1953).*The Structure of American Economy, 1919-1939*, Second Edition, (New York: Oxford University Press).

Lewis, W. A. (1970). *A Theory of Economic Growth*, (New York City, N. Y.: Harper Torchbooks, [Original 1955]).

Lewis, W. A. (1966a).*Development Planning: The Essentials of Economic Policy*, (New York, N. Y.: Harper and Row, Publishers).

Lewis, W. A. (1966b). "The ABC of the Development Programme 1966-1972, (Georgetown, Guyana: A Guyana Information Service Publications), pp. 3-55.

Ljungqvist, L., & Sargent, T. J. (2000). *Recursive Macroeconomic Theory*, (Cambridge, Mass.: The MIT Press, 2000).

Lowe, A. (1976).*The Path of Economic Growth*, (Cambridge, U. K.: Cambridge University Press).

Maddison, A.(1971). *Economic Growth in the West*, (New York, N. Y.: W. W. Norton and Company, Inc.).

Mahalanobis, P. C. (1955). The approach of operational research to planning. *Sankhya*, 16, 3-130.

Mahalanois, P. C. (1953). "Some Observations on the Process of Growth of National Income," *Sankhya,* 12(4), 307-312.

Meet the Press. (1961). Produced by Lawrence e. Spivak, with Guest: Dr. CheddiJagan, Prime Minister of British Guiana,(Washington, D. C: Merkle Press Inc, Volume 5, Number 40, Sunday, October 15).

Myrdal, G. (1971). *Economic Theory and Underdeveloped Regions*, (New York, N. Y.: Harperand Row, Publishers)

Nurkse, R. (1967). *Problems of Capital Formation in UndevelopedCountries and Patterns of Trade and Development*, (Oxford, U. K.)

Okun, A. M. (1962). "Potential GNP: Its Measurement and Significance." Reprinted as *Cowles Foundation Paper 190.*

Pandian, P. & Jayalakshmi, M. (2013). On Solving Linear Fractional Programming Problems, *Modern Applied Science,* 7(6), 90-100.

Percival, J. (1975). On the Selective Use of Spectral Analysis, *The Review of Economics and Statistics*, 57(1), 107-109.

Ramrattan, L & Szenberg, M. (2007). Paul Samuelson and the Dual Pasinetti Theory, *The American Economist*, 51(2), 40-48.

Robbins, L. S. (1968). *The Theory of Economic Development in the History of Economic Thought*, (London, U. K. Macmillan: St. Martin's Press).

Rostow, W. W. (1960). *The Stages of Economic Growth: A Non-Communist Manifesto*, (Cambridge, U. K.: Cambridge University Press).

Saaty, T. (2005). *Theory and Applications of the Analytic Network Process: Decision Making with Benefits, Opportunities, Costs, and Risks,* (Pittsburg, PA: RWS Publications).

Sen, A. (1995). *Inequality Reexamined*, (Cambridge Mass.: Harvard University Press).

Sen, A., Muellbauer, J., Kanbur, R., Hart, K., & Williams, B. (1987). *The Standard of Living,* edited GoeffreyHarthorn, (Cambridge, U. K.: Cambridge University Press).

Sen, A. (1968). *Choice of Techniques: An Aspect of the Theory of Planned Economic Development*, (Oxford, U. K.: Basil Blackwell).

Streeten, P. P. (1995). *Thinking About Development*, (Cambridge, U. K.: Cambridge University Press).

Taeuber, I. B. (1952). "British Guiana: Some Demographic Aspects of Economic Development," *Population Index*, Vol. 18, No. 1 (Jan.), pp. 3-19.

Thorne, A. P. (1961). "British Guiana's Development Programme: Analysis of Berrill Report and Newman Article". *Social and Economic Studies*, 10(1), 6-17.

Tinbergen, J. (1972). "Building a World Order," in Jagdish N. Bhagwati edited, *Economics and World Order: From the 1970's to the 1990's,*" (London, U. K.: The MacMillan Company), pp. 141-157.

World Bank. (1992). *Guyana: From Economic Recovery to Sustained Growth*, (Washington, D. C.: A World Bank Country Study, 1993, for Fiscal Year January 1 to Dec. 31).