# Trends and Changes of Gross Domestic Product and Government Budget-Expenditures in Papua New Guinea: Has 'Economic Development' also been taking place?

**Paper prepared for Papua New Guinea Update Seminar, June 2014**

(Gomi J Gipe, Applied Economics, Department of Business studies, PNG University of Technology)

**Abstract**

The purpose of the paper is two-fold. The first is to show results of computation of trends and changes of Gross Domestic Product and Budget-Expenditure in PNG. The second is to open-up critical discussions using insights gained from the calculations about some broader question or issues that have, apparently, been neglected in PNG's formal public forums, conferences, or seminars in recent years.

The Keynesian income-determination model and Todaro's development insights (8) provide the theoretical underpinning of the assessment.

The paper provides results of calculations of important statistics, including public expenditure elasticity and expenditure propensity of PNG's national government of selected periods; which include 2013 and 2014.

On the basis of the results the paper provides critical assessment on serious implications or ramifications of 'real economic development' in PNG over the years, including the most recent years.

The paper concludes that, whilst it is important to efficiently and effective incur annual National government budget-expenditures, as the government tries to do. Simultaneously, it is imperative to ensure that 'economic development' of PNG's people are also taking place over time; consistent with the five goals and directive principles of the National constitution; especially among the majority of the people, who live in rural village environments.

## Trends and Changes of Gross Domestic Product and Budget-Expenditures in Papua New Guinea: Has 'Economic Development' also been taking place?

**PART 1 Long-term Trends and Changes of PNG's Gross Domestic Product and Budget-Expenditures, 1977-2014**

The main question we have asked and attempted to answer is; 'What has been the long-term trends and/or changes of PNG's Gross Domestics Product and Budget-Expenditure?

For most of 38 years the story of PNG Central Government's GDP and Budget-Expenditures are shown in the following two statements;

(a) *Expenditure Elasticity*: In general, in 38 years, a 1% change in PNG Central Government's Budget-Expenditure has resulted in ***less*** *than 1% change in GDP*. In other words in 38 years much of the Central Government Budget-Expenditure might have been used ***inefficiently***. The finding has important implications for real 'economic development' in PNG. It is apparent that Budget-Expenditure of the Central government was efficiently used in 6 of the 38 years: 1983, *1991, 1992, 1993, 1994 and 2014. This fact which implies that the Central Government's Budget-Expenditure was used* inefficiently *for 32 of the 38 years of study.* Table 1 summarizes the results.

(b) *Expenditure Propensity*: In general, in 38 years, Central Government of PNG incurred ***low*** expenditure propensity in 29 years. In 9 years there was ***high*** expenditure propensity.

It is a considered view of the researcher that the trends and/or changes seem to reflect policy administration practices (as opposed to theory of policy) for most of the 38 years of the study.

**Table 1 Estimates of PNG's Gross Domestic Product, Government Budget-Expenditure,Expenditure Elastcity and Expenditure Propensity 1977 to 2006**

| Year | GDP | | | | Expenditure | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | (In 1988 prices | Average | Change of GD | Change of | (K Million) | Average | Change in Exp/ | Change of | Expenditure | Expenditure |
| | (K Million) | GDP | Avearge GDP | GDP | | Expenditure | Average Exp | Expenditure | Elasticity | Propensity |
| | | | | | | | | | | |
| 1977 | 1732 | 0 | 0 | 0 | 241 | 0 | 0 | 0 | 0 | 0 |
| 1978 | 1835 | 2779 | 0.036846 | 102 | 489 | 773 | 0.320434839 | 248 | 0.11498687 | 0.421158773 |
| 1979 | 1889 | 2824 | 0.019191 | 54 | 568 | 883 | 0.089165335 | 79 | 0.21522866 | 0.467271957 |
| 1980 | 1871 | 2817 | -0.006461 | -18 | 630 | 960 | 0.065057756 | 62 | -0.09931533 | 0.513214305 |
| 1981 | 1892 | 2857 | 0.007524 | 22 | 660 | 1015 | 0.029521022 | 30 | 0.25488016 | 0.536343938 |
| 1982 | 1930 | 3003 | 0.012720 | 38 | 710 | 1104 | 0.045006115 | 50 | 0.28262776 | 0.571824492 |
| 1983 | 2146 | 3208 | 0.067058 | 215 | 788 | 1239 | 0.063456438 | 79 | 1.05676335 | 0.577322302 |
| 1984 | 2124 | 3225 | -0.006574 | -21 | 901 | 1407 | 0.07986612 | 112 | -0.08231722 | 0.662444099 |
| 1985 | 2201 | 3363 | 0.022718 | 76 | 1013 | 1576 | 0.071321824 | 112 | 0.31853012 | 0.716051711 |
| 1986 | 2325 | 3519 | 0.035181 | 124 | 1125 | 1744 | 0.064430138 | 112 | 0.54603249 | 0.750428049 |
| 1987 | 2389 | 3618 | 0.017799 | 64 | 1238 | 1913 | 0.058721591 | 112 | 0.30311504 | 0.800755578 |
| 1988 | 2458 | 3670 | 0.018937 | 70 | 1350 | 2082 | 0.054021724 | 112 | 0.35054071 | 0.846717377 |
| 1989 | 2423 | 3599 | -0.009725 | -35 | 1463 | 2250 | 0.04994767 | 112 | -0.19471307 | 0.928511595 |
| 1990 | 2351 | 3639 | -0.019953 | -73 | 1575 | 2419 | 0.046466342 | 112 | -0.42941356 | 1.028900800 |
| 1991 | 2575 | 4041 | 0.055578 | 225 | 1687 | 2587 | 0.043438687 | 112 | 1.27946407 | 1.004630349 |
| 1992 | 2932 | 4664 | 0.076350 | 356 | 1800 | 2756 | 0.040781448 | 112 | 1.87217368 | 0.940102337 |
| 1993 | 3465 | 7332 | 0.072779 | 534 | 1912 | 2896 | 0.038803342 | 112 | 1.87559489 | 0.835877752 |
| 1994 | 7733 | 11467 | 0.372227 | 4268 | 1968 | 2981 | 0.018854631 | 56 | 19.74195497 | 0.385437006 |
| 1995 | 7467 | 11446 | -0.023291 | -267 | 2025 | 3044 | 0.018461336 | 56 | -1.26161312 | 0.407703537 |
| 1996 | 7960 | 11687 | 0.042167 | 493 | 2039 | 3261 | 0.004477498 | 15 | 9.41754874 | 0.409667693 |
| 1997 | 7455 | 11357 | -0.044450 | -505 | 2443 | 3809 | 0.106039722 | 404 | -0.41918551 | 0.510946115 |
| 1998 | 7804 | 11778 | 0.029624 | 349 | 2732 | 4222 | 0.068352182 | 289 | 0.43339551 | 0.541064381 |
| 1999 | 7948 | 11825 | 0.012245 | 145 | 2981 | 4631 | 0.053855041 | 249 | 0.22737413 | 0.582626692 |
| 2000 | 7753 | 11628 | -0.016787 | -195 | 3300 | 5109 | 0.062362371 | 319 | -0.26918581 | 0.658934375 |
| 2001 | 7750 | 11702 | -0.000308 | -4 | 3618 | 5587 | 0.057027789 | 319 | -0.00539442 | 0.720908176 |
| 2002 | 7905 | 12032 | 0.012949 | 156 | 3937 | 6065 | 0.052533947 | 319 | 0.24649269 | 0.767152832 |
| 2003 | 8252 | 12402 | 0.027979 | 347 | 4256 | 6543 | 0.048696609 | 319 | 0.57456713 | 0.792805729 |
| 2004 | 8299 | 12612 | 0.003703 | 47 | 4574 | 7020 | 0.045381706 | 319 | 0.08159479 | 0.845929077 |
| 2005 | 8625 | 13037 | 0.025014 | 326 | 4893 | 7498 | 0.042489348 | 319 | 0.58870998 | 0.869353754 |
| 2006 | 8823 | 13357 | 0.014817 | 198 | 5211 | 7961 | 0.04001859 | 319 | 0.37024405 | 0.90232458 |
| 2007 | 9067 | 13817 | 0.017652 | 244 | 5500 | 9276 | 0.031123329 | 289 | 0.56716836 | 1.023050623 |
| 2008 | 9500 | 14278 | 0.030327 | 433 | 7552 | 10896 | 0.188325991 | 2052 | 0.16103692 | 1.146947368 |
| 2009 | 9555 | 14805 | 0.003715 | 55 | 6688 | 10735 | -0.080488146 | -864 | -0.04615538 | 1.123443223 |
| 2010 | 10500 | 16300 | 0.057975 | 945 | 8093 | 12779 | 0.109950307 | 1405 | 0.52728784 | 1.21700000 |
| 2011 | 11600 | 17700 | 0.062147 | 1100 | 9371 | 14395 | 0.088783911 | 1278 | 0.69997922 | 1.240905172 |
| 2012 | 12200 | 18750 | 0.032000 | 600 | 10047 | 15983 | 0.042294938 | 676 | 0.75659172 | 1.310081967 |
| 2013 | 13100 | 20350 | 0.044226 | 900 | 11872 | 17858 | 0.102195095 | 1825 | 0.43276093 | 1.363206107 |
| 2014 | 14500 | 17557 | 0.079740 | 1400 | 11972 | 13725 | 0.007286017 | 100 | 10.94427278 | 0.946546162 |
| **Average** | **6114** | **9159** | **0.0311484** | **336** | **3506** | **5289** | 0.05969638 | **309** | **1.353516425** | **0.772831315** |

Source: Bank of PNG quoting National Statistical Office, Various periods

For Government expenditure, data from 1977 to 1983 and from 1995 to 1999 and 2007 to 2013 are actual.

The rest are estimates by interpolration. For National income data from 1977 to 2006 are actual. The rest are estimates

# PNG's income-determination in theory

In theory a national government budget has five functions. They are named as allocative, distributive, control, management, and stabilization functions (7: 3-14). It is the latter function which is of concern to us in the paper. The budget-expenditure affects Aggregate Demand in these manners: it changes the level of Aggregate Demand, the level of income, the level of employment and the level of prices. Further budget-expenditure affects the division of output between consumption and capital formation and hence the rate of economic growth in PNG, via the Multiplier and the accelerator.

**A Static Income Multiplier**

John Maynard Keynes defined the multiplier as the ratio of change in real GDP to a change in any component of Aggregate Expenditure that causes the change in GDP. For example. If there is an increase in PNG Government expenditure, it will cause a change in PNG's real GDP. The multiplier is written as,

$$\delta = \frac{1}{1-\lambda} \qquad (1)$$

Where $\lambda$ is change in anyone of the four components or sectors of Aggregate Expenditure. In realistic formulations income and lump-sum taxes are included in the model (See below).

$$AE = C + I + G + NX \qquad (2)$$

Where C is consumption expenditure
I is Investment expenditure
G is Government expenditure
Nx is Net Exports

**Operation of the model**

There is a *static knife-edged relationship* between any of the four macroeconomic elements; namely national income, aggregate expenditure, national savings, and national investment.

Since savings, is income less consumption, which, in a simplistic assumption, equals *investment*. In equilibrium Aggregate Expenditure (AE) must equal output (Y) or income, and savings (which is income less consumption) must be offset by investment.

Two possible scenario could develop in PNG at any point in time. If the level of output produced in PNG economy in a period of time, usually a year, (hence income) is greater than OY0, (that is to the right hand side of OY0 in Figure 2), relative to Aggregate Expenditure, (which is really Aggregate Demand expressed in the market), will be not be sufficient to purchase that output. Therefore there would be an excess supply, or AS > AD.

**Possible causes of macroeconomic mismatch**

How would a macroeconomics mismatch develop in PNG? It is accepted that PNG is a small, open, trade-related economy. This statement implies that PNG can become vulnerable most times. There are a host of factors which can, and do, create possible mismatches.

For example. Firms in PNG could misjudge the level of demand and over-produced goods and services. As a result there is excess supply.

Alternatively, consumers may not be too confident about the PNG economy, and become reluctant to spend their income. Or there could be leakages to the system via any one of the three components of the Withdrawal (Savings, Imports and Taxes). Or it could be effects of taxes, interest rates and exchange rates.

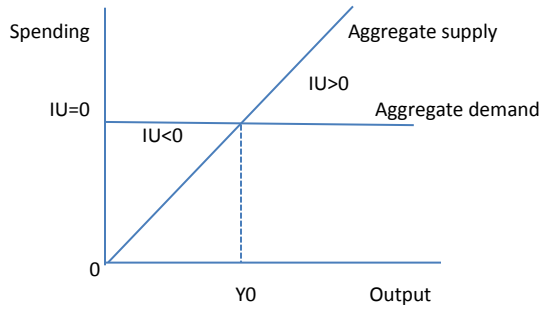
Whatever might cause the mismatch, it becomes a policy problem for any PNG government. The government needs to, first of all, identify what the problems are, and secondly, formulate a mix of policies which can address the problems efficiently and effectively. The mix of policies could be in any one of these areas; Fiscal, Monetary, Exchange rate and others.

A doctor carefully examines a sick patient before he/she administers correct type and correct level of medicine. PNG government economists need to carefully and prudently diagnoses an economic problem prior to policy administration. A wrongful diagnosis and a wrong policy can cause irreparable damages to PNG economy.

Sometimes government economists may not correctly diagnose PNG's monetary or fiscal problems. For example. Today many ordinary PNG people may be skeptically about the explanations given about recent almost sudden depreciation of the Kina value in 2013. In general through, often diagnosis maybe about 50% of macroeconomic management problem; successful implementation maybe another 50%. To make matters worse, government economists may heavily depend core statistical information. However some statistical information may be suspects. For example, some of the financial statistics may be outdated or not produced consistently over time. Being a developing country, her problems may be much more difficult than we first envisaged.

Assuming constant supply, what would happen when demand rises *ceteris paribus*. There will be at least three consequences; (a) firms will produce more (b) firms will increase their prices or (c ) firms will sell from their available stock (See Exhibit 1).

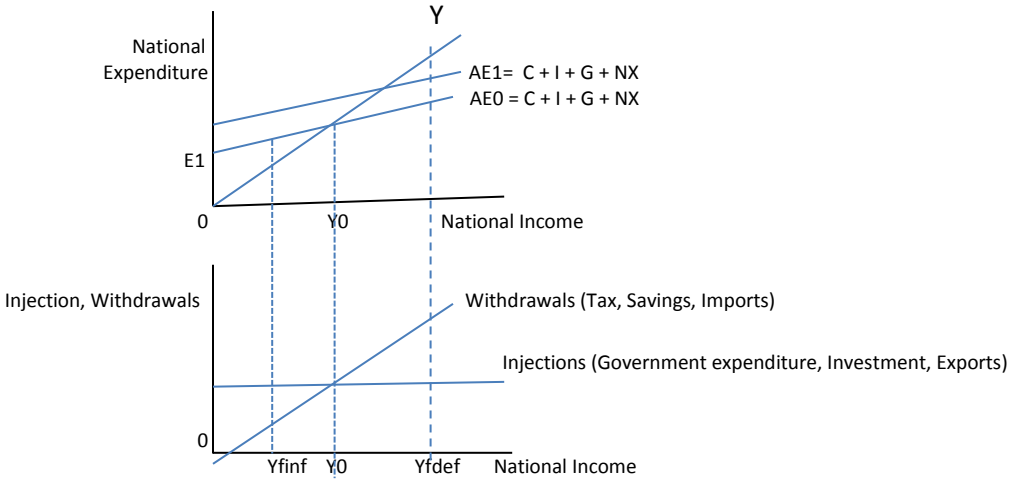
Exhibit 1 Relationship between Aggregate supply and Spending




Source: Dornbusch and Fischer, 1990

With this understanding we need to properly perceive how income might be determined in PNG. Income determination for a three-sector economy would be shown as follows; AE = C + I + G (See Exhibit 2).

**Exhibit 2 Schematic illustration of PNG's income-determination**




Source: Gipe G J, 2014

Two potential scenario could be envisaged for PNG, with their appropriate broad policy regimes. If equilibrium (AE =Y0) settled ***below*** full employment level of output (implying existence of a deflational gap as in YFdef), government expenditure could be used to increase total expenditure, hence national income.

On the other hand if equilibrium (AE=Y0) settled ***above*** the full employment level of output (implying existence of a inflational gap, as in Yfinf), the government could reduce income or discourage the total spending.

**Aggregate Expenditure and Multiplier**

Following Musgrave and Musgrave (7) theory of budget-expenditure can be discussed in the context of Keynesian income-determination model. PNG's basic income-determination may be described

algebraically to include fiscal multipliers, initially with investment being fixed, and later with changes to investment.

**Model without Government Expenditure**

The consumption function has an autonomous (C*) part and a proportion which is consumed out of total income (cY), may be written as;

$$C = C^* + cY \quad (1a)$$

If we consider disposable income, Y, being income less tax, we may write;

$$C = C^* + cYD \quad (1b)$$

If PNG's investment, particularly, Foreign Direct Investment, (FDI) is independent of income; that is, not affected by level of income, it may be written as;

$$I = I^* \quad (2)$$

A simple Aggregate Expenditure (AE) is a sum of consumption and investment expenditure without government expenditure and may be written as;

$$AE = C + I \quad (3)$$

Since we know the value of consumption and investment we substitute them into (3) to obtain,

$$AE = C^* + cY + I^* \quad (4)$$

There is an adjustment of output to Aggregate Expenditure the short-run equilibrium is written as;

$$Y = AE \quad (5)$$

Since we know the value of AE we can expand (5) and write as;

$$Y = C^* + cY + I^* \quad (6)$$

To find the Equilibrium level of output (hence income), we need to solve for Y, and is written as;

$$Y(1-c) = C^* + I^* \quad (7a)$$

$$Y = \frac{1}{1-c}(C^* + I^*) \quad (7b)$$

In short we could re-write, (7b) as;

$$Y = \delta R^* \quad (7c)$$

Where $\delta$ is the Multiplier value, 1/(1-c), and R is sum of the autonomous components, C* + I*.

The value of Y can be calculated if we know the values of C*, I* and c.

**Changes in investment**

What will happen when there is a change in PNG's investment spending? Let us denote the original level of income with Y1 and a change with delta sign, $\Delta$. Using (7c), an increase in PNG's investment spending increases R* by $\Delta R$ as shown;

$Y1 = \delta R^*$

After an increase in PNG's investment expenditure, Y1 now becomes;

$Y2 = \delta (R^* + \Delta R)$ (8)

As a result the increase in income may be written as;

$Y2 - Y1 = \delta (R^* + \Delta R) - \delta R^*$ (9a)

$\Delta Y = \delta(R^* + \Delta R) - \delta R^*$ (9b)

Expanding (9b) yields us;

$\Delta Y = \delta R^* + \delta \Delta R - \delta R^*$

$= \delta \Delta R$

**Model with government expenditure**

In addition to equations 7(a) to 8, we add a couple of behavioral equations,

$G = G^*$ (10)

$TX = TX^*$ (11)

$TR = TR^*$ (12)

**Definitional equations are also added**

| | | |
|---|---|---|
| $AE = C + I + G$ | Aggregate expenditure with government | (13) |
| $YD = TR - TX$ | Disposable income | (14) |
| $Y = AE$ | Equilibrium | (15) |

**Model with government expenditure**

$Y = C + I + G$ (16)

$C = C^* + cY$ (1a)

$Y = \frac{1}{1-c}(C^* + I + G)$ (17)

$\Delta Y = \frac{1}{1-c}\Delta G$ (18)

**Model with lump-sum tax**

$Y = C + I$ (19)

$C = C^* + c(Y-T)$ (20)

$Y = \frac{1}{(1-c)}(C^* + I - cT)$ (21)

$\Delta Y = \frac{1-c}{1-c}\Delta T$ (22)

**Model with income tax**

From (16): $Y = C + I$

$C = C^* + c(1-t)Y$ (23)

$Y = \frac{1}{1-c(1-t)}(C^* + I)$ (24)

**Model with government expenditure and income tax**

From (16): $Y = C + I + G$

$C = C^* + c(1-t)Y$ (25)

$Y = \frac{1}{1-c(1-t)}(C^* + I + G)$ (26)

$\Delta Y = \frac{1}{1-c(1-t)}\Delta G$ (The Multiplier) (27)

## PNG's Income-determination in practice

There exist a number of difficulties. However in the section we shall attempt to apply the theory, as best as we can, with respect to income-determination in practice. The results should be treated with some caution, given problems availability of reliable time-series data, as alluded to earlier.

**Simple questions and answers**

1. Question: Between 1977 and 2014 what is PNG's National Government Expenditure Multiplier?

With respect to overall calculations, the concept involves the estimation of the change of annual PNG Government expenditure divided by change of PNG annual GDP over 38 years.

The Answer: The Marginal Propensity to Consume Domestically produced goods and services in PNG in the named period, is estimated to be ***0.91877942*.**

The Multiplier is calculated using 1/1-MPCd. Where Mpcd, in our case, is ***0.0800***. Therefore PNG Central Government's Expenditure Multiplier is estimated to be ***12.5.***

2. Question: What is the Tax Multiplier? The figure for Tax Multiplier is 1.0 less than the Government Expenditure Multiplier and is negative. Therefore the Tax Multiplier is, ***-11.5.***

For the formal sector, it is presumed that PNG's full employment in the formal sector is achieved at **K5,220** Million (Assumptions: the figure represents average income and expenditure for 38 years, give and take about 10%).

3. Question: Give the presumed level of full employment income, is there a deflationary gap or an inflationary gap? What is the level?

It is again presumed that PNG's Equilibrium National Income was ***K2, 572* Million.** (Assumptions: the figure represents the period in PNG's history in which the closest she came to reach theoretical requirement for equilibrium income, which is AE=Y0). The National income is K2, 648 Million below full employment national income.

Therefore with a Multiplier of ***12.5*** there is a *deflationary gap* estimated as follows; **K2, 648/12.5 = *K211.84*** Million.

4. Question: By how much would PNG government expenditure have to be changed in order to close the gap? (Assuming no shift in other injections or withdrawals).

The Answer: Government expenditure would have to increase by **K211.84 Million** in order to close the gap.

5. Question: Alternatively by how much taxes would have to be changed in order to close the gap? (Again assuming no shift in other injections or withdrawals)

The Answer: With a Tax Multiplier of ***-11.5***, taxes would have to be reduced by K211.84/11.5 = ***K18.42*** Million.

6. Question: Alternatively assuming that there were initially a balanced budget, and that the government wanted to maintain a Balanced Budget, by how much would both Government expenditure and taxes have to be changed in order to close the gap?

The Answer: The Balanced Budget multiplier is ***1.0.*** Therefore to raise National income by ***K211.84*** Million both government expenditure and taxes would have to be increased by **K211.84 Million**.

## Part 2 Has 'Economic Development' also been taking place in Papua New Guinea?

**Definition**

**What do we mean by the term 'Economic Development?'**

The term 'economic development' is defined as a general improvement of the living standards of the majority of people of a country over time. It is usually measured by increases in real Gross National Product (GNP) or Gross Domestic Product (GDP) over time. The difference between GNP and GDP is Net Factor Payment Abroad. For example, PNG's GDP includes income of PNG citizens who are working in overseas countries, such as in Australia or New Zealand, or other countries.

More specifically 'economic development' is defined as a '*process whereby real per capita income increases of the masses of the people over time, subject to the stipulation that the number of persons below poverty line does not increase and the distribution of income does not become more pronounced'.* (2).

**PNG's economics development**

Todaro (8: 56-63) says that in many developing countries around the world in 21st century economic development has not been taking place as envisaged by the governments.

In particular the 'twin enemies' of genuine economic development have been making in-roads and encroaching in the daily lives of millions of people around the world and PNG: income inequality and poverty. Many public servants and political leaders seem to be oblivious to the rising of the twin problems. It is to these that we turn.

**Evidence of income inequality in PNG, 1967-1990**

Evidence of rising income inequality in Papua New Guinea for the period 1967 and 1990 is summarized in table 2 (5).

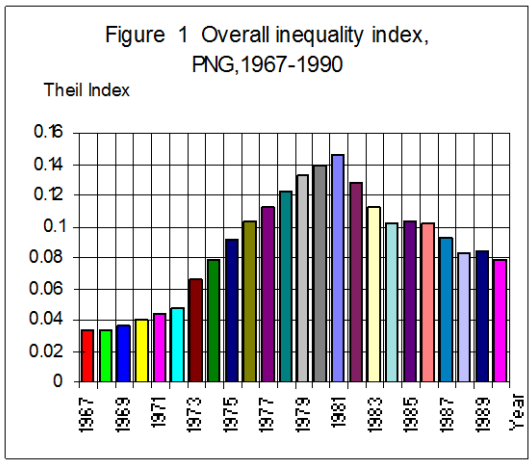
| Table 2 | |
|---|---|
| Income inequality index, PNG,1967-1990 | |
| 1967 | 0.032960255 |
| 1968 | 0.033258193 |
| 1969 | 0.035559092 |
| 1970 | 0.039404624 |
| 1971 | 0.043682977 |
| 1972 | 0.048271734 |
| 1973 | 0.065867809 |
| 1974 | 0.078483063 |
| 1975 | 0.091139104 |
| 1976 | 0.10280654 |
| 1977 | 0.11205058 |
| 1978 | 0.122990278 |
| 1979 | 0.132465699 |
| 1980 | 0.139545559 |
| 1981 | 0.145166896 |
| 1982 | 0.127764024 |
| 1983 | 0.112806563 |
| 1984 | 0.102080985 |
| 1985 | 0.102961192 |
| 1986 | 0.101810385 |
| 1987 | 0.092791057 |
| 1988 | 0.08277593 |
| 1989 | 0.083816127 |
| 1990 | 0.079228626 |

Source: Gipe J G M.Com Honours Thesis, 1994

Figure 1 shows that income inequality in PNG had risen to a turning point in 1981 and then tapered off thereafter. The aggregate inter-provincial income inequality rose by 179 per cent[1]. The average annual growth is 9 per cent. While income inequality had fallen in the World and in the Asia-Pacific region, it had risen by substantial amounts in PNG[2].

[1]For a comparison with World trends in the same period, calculations by Levy and Chowdhury (1993:30,33) show that the World-wide level of Thiel index of income inequality had fallen by 2.47 per cent. In the same period the inter-country income inequality in the Asia-Pacific region had fallen by 45.04 per cent.

[2]The comparison should be interpreted with care because the Levy-Chowdhury study did not do analysis by region of a country. Also the PNG analysis had been done in real Kina whereas the Levy-Chowdhury study had used purchasing power parity of the Pennsylvanian World tables using the USA dollars. Further they did not have a comparison of PNG in mind.




A closer study of Figure 1 shows that the overall income inequality in PNN in the period of study had three phases[3]: Phase 1, (1967 to 1972) , phase 2 (1973 to 1981) and phase 3 (1982 to 1990). Explanations of the patterns are given as follows. The effects of the regional income inequalities became translated into the overall country inequality. The opposite trends of the Southern and the Highlands regions neutralised each other (which are not shown in this paper due to space).

**Symptom 1 Growth of Gross Domestic Product**

The details shown in this section are drawn from a note prepared for Applied economics students at the Department of Business studies, PNG University of Technology, by the author in August 2000 (4), and occasionally edited.

Our ***first hypothesis*** is that as Gross Domestic Product (GDP) rises over time, the share of agriculture and other sectors in the GDP would fall (See Figure 2). This would be due to industrialization taking place in the economy.

Figure 2 Share of agriculture in GDP should be falling over time


Period 1 Period 2

**What do the facts show for PNG?**

What are the facts of GDP of PNG? In 1966 the GDP of PNG was K6.5 billion. This was equivalent to about US$1,130.00 person. Or K1, 500.00 per person. On this basis PNG is grouped under “Middle income” country. But this could be misleading, because PNG is hardly in the Middle income country.

[3]A "phase" is defined as a period marked by district trends or characteristics.

After a period of relatively slow growth from mid 1980s the GDP increased by 10% in 1991, 12% in 1992, and 17% in 1993. These growths were influenced by the rapid growth of mineral and petroleum output in these periods. Then from 1986 to 1996 the GDP of PNG grew at the rate of about 4% per annum periods (Quoted in 4, AUSAID, Economic Survey of PNG, August 1997:11, 12).

Table 3 Estimate of Agriculture as a component of PNG' s recent GDP

| | 1985 | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| GDP (K Mill) | 2201 | 2324 | 2389 | 2458 | 2423 | 2351 | 2575 | 2932 | 3323 | 3459 | 3428 | 29,862 |
| Agric. (K Mill.) | 395 | 407 | 380 | 353 | 366 | 285 | 295 | 372 | 680 | 869 | 948 | 2,715 |
| Agric.. as per cent of GDP | 18% | 18% | 16% | 14% | 15% | 12% | 11% | 13% | 20% | 25% | 28% | 9% |

* Includes Forestry Source: Calculated by author from (AUSAID, Economic survey of PNG, AUSAID, August 1997: 152, 171).

Table 4 Average Cash income per wage earner of Lae compared with other centres

Average Cash income per wage earner by type of income and dwelling (In Kina per fortnight)

| | Port Moresby | Lae | Rabaul | Madang | Wewak | Popondetta |
|---|---|---|---|---|---|---|
| Average cash wage* per wage earner | 80 | 74 | 71 | 69 | 76 | 75 |
| Average non-wage cash income per earner | 84 | 73 | 65 | 64 | 65 | 68 |
| Estimates of: | | | | | | |
| Wage income earned (K ' 000) | 2,332 | 879 | 296 | 287 | 257 | 86 |
| Other cash non-wage income | 105 | 73 | 68 | 67 | 81 | 17 |
| Sub total | 2,437 | 952 | 364 | 354 | 338 | 103 |
| Wage income earned annual (K'000) | 60,632 | 22,854 | 7696 | 7462 | 6682 | 2236 |
| Other cash non-wage annual (K'000) | 2,730 | 1,898 | 1,768 | 1,742 | 2,106 | 442 |
| Sub-total | 63,362 | 24,752 | 9464 | 9204 | 8788 | 2678 |

Source: Bureau of Statistics, 1977, Urban Population survey, Bulletin No. 2 table 7: 10, Bulletin No.3 Port Moresby

Table 7: 11, Bulletin 4 Table 70.11

* Wage covers all income from wages to salaries.

Table 5 Citizen population by labour force

| | Port Moresby | Lae | Rabaual | Madang | Wewak | Popondetta | Total |
|---|---|---|---|---|---|---|---|
| **Labour Force:** | | | | | | | |
| Employed wage earners | 29,150 | 11,890 | 4, 170 | 4,330 | 3,390 | 1,150 | 49,910 |
| Other employed | 1,250 | 1,000 | 1,060 | 1,770 | 1,260 | 260 | 6,600 |
| Unemployed | 4,630 | 1,810 | 1,536 | 0 | 670 | 150 | 8,796 |
| Total | 35,030 | 14,700 | 2,596 | 6,100 | 5,320 | 1,560 | 65,306 |
| Not in labour Force: | | | | | | | |
| Subsistence farm | 460 | 140 | 240 | 220 | 120 | 80 | 1260 |
| Doing housework | 13,420 | 5,370 | 1,770 | 1,980 | 1,830 | 590 | 24,960 |
| Unable to work (Sick, old etc..) | 1,190 | 290 | 230 | 270 | 210 | 50 | 2,240 |
| Students | 16,020 | 6,370 | 3,310 | 4,170 | 3,960 | 1,510 | 35,340 |
| Children (less than 15 years, not students) | 26,580 | 11,340 | 4,220 | 4,990 | 5,340 | 1,560 | 54,030 |
| Persons in hotels and hospitals | 710 | 880 | 10 | 310 | 210 | 210 | 2330 |
| Short term visitors | 1,470 | 1,380 | 270 | 690 | 610 | 100 | 4,520 |
| Others* | 10 | 0 | 0 | 0 | 230* | 80* | 320 |
| Citizen population | 94,890 | 40,470 | 15,816 | 18,730 | 17,830 | 5,740 | 193,476 |

**Source:** Bureau of Statistics, Urban Population survey 1977, Bulletin No.2 Table 2: 6, Bulletin No. 3 Port Moresby Table 2:6, Bulletin 4 Table 2:6. Bulletin No.5 Table 2: 6, Bulletin No. 6 Table 2: 6, Bulletin No.7 Table 2:7

* Detainees in corrective institutions

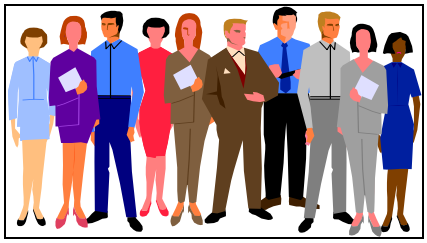
On the basis of Table 3, it seems that agriculture is about 9% of the recent GDP of PNG. The ten year trend is probably not long enough for us to make conclusive statements on whether agriculture as a component of GDP is decreasing in PNG over time. The trend appears to have been increasing in recent years. This is probably due to increasing value of agriculture in recent years, as GDP in money terms was used in the calculations, rather than GDP in real terms.

Tables 4 and 5 show the average cash income per wage earner, and citizen population by labour force in the 1970s. The income have generally been increasing in recent years.

**Symptom 2 Growth in Urbanisation**

Our ***second hypothesis*** is that as economic development takes place, urbanisation would increase over time. The theory is that as the share of agriculture in the GDP falls over time (See Symptom 1), people who are engage in agriculture development would leave their occupations and migrate to towns and urban areas. They migrate to urban areas because they would like to be involved in activities other than agriculture, where rewards are generally greater, such as going to University of PNG or Unitech to graduate with a degree to get a better job (See Figure 3).

Figure 3 People may migrate to urban areas for education purposes



Source: Word art

**What do the facts say about PNG?**

The earliest survey in PNG which we have are about Urban household survey of 1973/1974 and the Rural survey of 1974/1975. Other surveys have been conducted in recent years. These data can be combined with the data from the vary censuses to derive some pattern of urbanization in the country.

In PNG migration from rural into urban areas appears to be increasing. For example, between 1966 and 1971 the urban population grew at the rate of 17% per annum (Quoted in 4, Garnaut, Wright and Curtain, Employment incomes and Migration in PNG towns, IASER Monograph 6 1977: 3). In 1995 about 16% of PNG' s population lived in urban areas, compared with 10% in 1970 (Quoted in 4, AUSAID, Economic survey of PNG, AUSAID, August 1997: 10)

Whether this is due to increasing development or due to factors other than economic development, it remains to be established in due course. Also due to a lack of relevant data the rate of urbanisation in 1990s cannot be conclusively determined.

**Symptom 3 Declining population**

**Our *third hypothesis*** is that as economic development takes place, human population tends to stabilise and later decline. The theory is that as economic development increases people tend to get married at a later age. This is due to various reasons. Some of these reasons include the following (a) commitment to education (b) reduce family size and due to cost of living in the urban areas (c ) need to save more (d) need to improve their living standards and (e ) other related factors. People live healthier. Generally people want to live longer. The net effect of all these factors is that the general total population tends to stabilise, and later decline.

**What are the facts for PNG?**

To date PNG has had five national censuses to date, in 1966, 1971, 1980, 1990 and 2011 (4). When we made a casual study of the growth rates of PNG, we found that the growth rates have tended to rise over time.

For example. Between 1980 and 1990 PNG' s population growth was 2.3% per year. A that time this was one of the highest growth rates in the world. The 2011 census gives PNG a higher estimate—total population is growing at nearly 3% per year.

In 1990 the total population of PNG was 3.7 million. In mid-1995 it was estimated to be 4.3 million (Quoted in 4, AUSAID, Economic Survey of PNG, AUSAID, August 1997: 10).

Thus it seems PNG' s total population seems to be growing rapidly, and about 16% live in urban areas of PNG. Due to a lack of relevant data the 3rd hypothesis cannot be determined.

**Symptom 4 Share of income of majority of people spent on food items declines over time**

Our ***fourth hypothesis*** is that as economic development takes place, the share of income of the majority of the people of an emerging economy, spent on food items, tend to decrease over time (See Figure 4).

Figure 4 Component of expenditure spent on food


**What are the facts for PNG?**

We don't have up-to date relevant statistics to be able to measure the extent to which income of the majority of the people are spent on food over time. However we can hypothesis that at this stage of PNG' s economic development, the proportion of income spent on food is likely to be at least 50% or more.

**Symptom 5 Peoples' participation in economic development increases**

Our ***fifth hypothesis*** that as economic development takes place, the proportion of total population engaged in economic development activities increases over time.

**What are the facts for PNG?**

It is estimated that between 80 to 85% of the total population of PNG are engaged in subsistence agriculture. Or traditional sector. The theory says that many of these people should, over time, become involved with economic development in the modern or formal market economy.

It is our view that this is not happening, due mainly to no or little of choices and opportunities being given to the people to participate under the constitution of PNG.

# Conclusions: Comparing PNG with some of her neighbors

To expose a fresh perspective from PNG Businesses, the section quotes verbatim, from the first part of a speech which was delivered by Sir henry Chow, at the PNG University of Technology in 2008, at the invitation of the Vice Chancellor.

Sir Henry Chow said the following in 2008, with which we conclude the paper, which will help consolidate the sub-title of the paper;

'Papua New Guinea is a blessed country. She has seven million people and a land area of over 450,000 square kilometers. Compared with her neighbors PNG is very sparsely populated country, and very wealthy as for as land goes'.

'We are rich in natural resources, outside South Africa we have a few of the biggest gold mines in the world, and we rank No. 10 in the production of gold. We have the biggest tuna fish resource among the fourteen Pacific Forum countries, we harvest some 350,000 tonnes of tuna fish each year, about 70,000 tonnes are processed within PNG in the three factories at Wewak, Madang and Lae, and the balance of 280,000 tonnes is exported. A fourth tuna processing plant will be built in Lae and which will process 350 tonnes per day, or about 100,000 tonnes per year. This new factory will provide employment to some 6 000 people and three quarters of them will be women. We still have vast areas of tropical rain forest, and we harvest some three million cubic meters of round logs each year, only about 30% is processed in the country and the rest is exported. At this rate of harvesting our natural timber resources will last another 30 years. We produce and export about half a million tonnes of palm oil each year and we rank No. 4 in the production of palm oil, after Malaysia , Indonesia and Brazil. Our Land is much more fertile than that of Malaysia and Indonesia. We produce some of the world best organic coffee bean, and we export two million bags of coffee beans each year. STARBUCK, Nestle and General Foods, the three top processors and users of coffee beans in the world buy our coffee beans to blend with the beans from other countries to enhance and improve the flavor and taste. We have two of the biggest open cut copper mines in the world, the Bougainville Panguna mine and the OK Tedi mine in Western Province. The Panguna mine was one of the most profitable mines in the world. It was the first company in Australiasia to make one billion Australian dollar profit a year. In the 1970's the capitalization of Bougainville Copper Ltd on the Australia Stock Exchange was bigger than BHP, the largest Australian Company'.

'Although we are only a small producer of mineral crude oil at 40, 000 barrels a day, because of the high prices of crude oil these last two years, and the royalties and taxes derived from this crude oil gave the huge surpluses to PNG Government consolidated revenue'.

'Our production of copra and cocoa beans has been on a declining trend since Independence'.

'After independence, the then Finance Minister Sir Julius Chan brought in the Land Acquisition Scheme, which he provided the funds to buy back many copra, cocoa and coffee plantations, and handed them back to landowners at the costs of purchase. Unfortunately the scheme failed and was not successful. Today not a single of those acquired plantations is still operating profitably, many have gone back to the jungle, the bush trees have smothered the cocoa trees and they are now higher than the coconut trees. Many coffee plantations in the highland province went the same way'.

'At the same time Sir Julius Chan made available funds for use to buy back many trade stores throughout the country and handed them back to nationals. The scheme was called "Stret Pasin Stoa". The scheme employed and engaged trainers and instructors to train and educate operators to manage those stoas. For many years those "Stret Pasin Stoas" operated properly and successfully under the eyes and cares of instructors and trainers. Today after thirty years of operations, the "Stret Pasin Stoa" scheme has turned a 360 degree circle, almost all of those stoas have gone back to foreign hands'.

'In this year, 2008, PNG will import more than 200, 000 tonnes of rice and 100,000 tonnes of wheat for consumption. And 100% of the wheat comes from Australia and about 50% of rice from Australia and the balance 50% comes from as far as Egypt, India, U.S.A, and the near countries of Thailand and Vietnam'.

We are producing all the poultry and eggs consumed in the country. We produce 90% of the pork, 20% of the beef and about 70% of the chilled fish required. We import a lot of frozen fish from New Zealand.

'According to United Nations survey and statistics ***PNG Human Development Index*** has declined since independence. Most noticeable are the health services and education. Frequently hospitals and health clinics run short of drugs and medical supplies, many health clinics in the rural areas have closed due to many reasons. Hospitals have not been maintained properly'.

'Many children are not attending schools due to inability of parents to pay school fees, the standard of primary and secondary education has gone lower, infrastructure of school buildings and facilities have not kept space with the rest of the world'.

'We do not have to look far to see the deterioration of our infrastructures, especially the roads all over the country. The electricity, why do we have so many power disruptions each day. The telephone system, why the services are so poor. Is it really because we are short of funds?'.

'There are more than K3 Billion locked in trust accounts because of inability of our institutions to draw them down for use. There will be another three billion kina to add on to this sum by the end of year 2008. We need to carefully take note and analyze the reasons', Sir Henry Chow said in 2008.

**Reference**


(1) Dornbush and Fischer, Macroeconomics, Norton, 1990

(2) Eatwell J, Milgate M, Newman P, The New Palgrave Economic development, Macmillan reference Books, London, April 1989.

(3) Garnaut R, Wright M, Curtain R, Employment Incomes, and Migration in PNG towns, IASER Monograph 6, IASER, Port Moresby 1977.

(4) Gipe, G J, "Economic Development in Papua New Guinea: Has it been taking place since independence in 1975?" Department of Business Studies, Students Notes, PNG University of Technology, August 2000, edited 20th April 2014

(5) Gipe G J, Long-term changes of income inequality in Papua New Guinea 1967-1990, Department of Economics, University of Wollongong, Master of Commerce (Honours Thesis), 1994.

(6) Levy, A., and Chowdhury, K., (1993), "Inter-country income inequality 1960-1990: World levels and decomposition between and within geographical clusters and regions," Working Paper Series, No. WP 93-9, University of Wollongong, Department of Economics.

(7) Musgrave and Musgrave, Public Finance, New York, 1989.

(8) Todaro P M and Smith S C, Economic Development, Pearson Education Inc. publishing as Addison-Wesley, 11th Edition, 2012.

**Acknowledgment**

One would like to acknowledge and thank different people who have made this research and research paper possible. There are many people who have assisted the author on many ways and one acknowledges and thanks them all. In particular one would like to list and thank the following;

1. The PNG University of Technology for environment conducive for research.
2. The Head of Department Prof Chris Mbah for occasional encouragement and support for research
3. Mr Wesley Barilae the Administrative Officer of the Department, for proving various assistance
4. My wife and children who have put up with long nights on the computer
5. My son Solomon Jaungere for finding a hard drive and saving my work, at a point when one had only 1 GB left on 22/05/14 in the old hard drive and the PC was just about to crash, and the DBS IT Officer, who was advised two weeks ago, was still nowhere to be found.
6. The author has read and digested a number of books or papers for the purpose of this paper. Care was taken in rendering their views correctly. All Errors of facts and judgment are mine.