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Review

Value of PNG Merchandise Exports: Is it Real Growth

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Papua New Guinea is endowed with mineral resources and rich in agriculture and forest resources. It exports primary products like gold, copper, crude oil, coffee, tea, rubber, cocoa, copra, palm oil, rubber and logs owing to dismal growth of manufacturing sector. The value of total merchandise exports increased from K 1390.5 million in 1991 to K15, 579.5 in 2010 recording an annual growth rate of 51.02% during 1991 to 2010. The value of total merchandise exports after eliminating the influence of price changes, declined from to K 2362.00 million in 1994 to K1738.40 million in 2010. The growth in the value of merchandise exports was almost due to significant increase in international prices of the products that the country exports. Hence it is suggested that the country should build manufacturing sector to get the advantage of exporting value-added products.

Keywords: Merchandise exports, Export prices, Export quantities, Mineral products, Agricultural products.

INTRODUCTION

Papua New Guinea is rich in mineral resources, agriculture resources and forest resources, but poorly equipped with manufacturing facilities. The country exports primary products like gold, copper and crude oil, coffee, tea, rubber, cocoa, copra, palm oil, rubber and logs. Merchandise exports of Papua New Guinea play a vital role in the gross domestic product (GDP) of the country as percentage of value of merchandise exports to

GDP in current prices increased from 66.53% in 2004 to 75.11% in 2007, but declined to 60.22% in 2010 (Statistical Digest-2008 for GDP of the years 2004 to 2008).

Merchandise exports contribute significantly to the GDP of Papua New Guinea. But the percentage of the value of merchandise exports in GDP at current prices declined during 2009 and 2010. This was mostly due to decline in the total value of merchandise exports of Papua New Guinea. International commodity prices and quantity of exports are the two significant factors that determine the value of merchandise exports. Hence the study is undertaken, to ascertain the impact of these two factors on the value of merchandise exports.

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Table 1: Value of Merchandise Exports- Classified by Commodity Group (in Millions of Kina)

Year	Agricul- And other exports	Forest Products		Marine Products	Mineral			Total		
		Logs	Total		Crude Oil	Gold	Copper	Total	Domestic Export	Total Exports
1990	204.6	65.2	79.6	8.2	0.0	393.2	349.2	757.5	1049.9	1122.4
1991	204.6	81.2	90.2	10.4	0.0	666.9	323.8	1005.3	1310.5	1390.5
1992	223.6	140.0	148.2	9.3	301.4	745.9	313.5	1371.5	1752.6	1862.6
1993	270.1	400.2	410.4	7.8	817.8	681.6	256.3	1767.8	2456.1	2527.3
1994	374.6	483.1	494.4	10.3	702.7	702.3	367.4	1782.7	2662.0	2662.0
1995	502.4	436.7	449.7	12.3	827.7	840.1	754.5	2435.4	3399.8	3399.8
1996	578.6	464.8	480.3	10.4	1073.9	773.6	387.0	2244.6	3313.9	3313.9
1997	777.2	409.3	433.6	9.6	852.2	718.7	259.8	1838.9	3059.3	3059.3
1998	1020.2	154.2	173.2	42.2	813.1	1227.8	395.7	2452.1	3687.7	3687.7
1999	1165.0	255.6	265.9	30.4	1382.4	1546.1	574.3	3524.0	4985.3	4985.3
2000	955.5	283.5	308.8	33.7	1870.8	1950.8	595.4	4443.7	5741.7	5741.7
2001	801.1	234.3	310.9	77.2	1889.4	2115.1	859.1	4895.6	6084.8	6084.8
2001	803.8	255.7	332.3	75.3	1889.4	2115.1	859.1	4895.6	6107.0	6107.0
2002	1084.9	365.5	414.1	94.1	1431.2	2294.8	1018.7	4774.0	6367.1	6367.1
2003	1390.8	369.6	416.0	125.3	1631.9	2811.2	1415.0	5890.0	7822.1	7822.1
2004	1688.0	355.7	459.5	262.1	1652.2	2779.5	1544.2	6007.5	8417.1	8417.1
2005	1949.9	404.9	476.3	193.0	2283.1	2834.1	2497.7	7651.9	10271.1	10271.1
2006	1653.3	491.0	526.7	191.3	2988.5	3090.9	4329.5	10459.3	12830.6	12830.6
2007	2295.4	567.6	631.2	221.6	2983.6	3674.4	4172.7	10910.6	14058.8	14058.8
2008	2969.0	468.0	537.9	293.2	3506.1	4669.3	3616.7	11855.5	15655.6	15655.6
2009	2223.5	383.1	409.9	207.3	1610.4	5366.7	2025.9	9057.0	11897.1	11902.8
2010	2961.3	705.9	743.7	91.7	2224.8	6380.3	3089.3	11782.8	15579.5	15579.5

Source: Quarterly Bulletins for the respective years, Bank of Papua New Guinea.

The study is based on secondary data. Secondary data were collected from books, reports, journals, websites and other published research studies. Primary data were also collected with the help of structured questionnaires and supplemented wherever necessary. All relevant parameters of export-driven economies including export zones, cluster approaches and supply-chain management approaches were identified. Appointments for this research were done through the Department of Trade and Industry and other departments of Government of Papua New Guinea. Appropriate statistical tools were used wherever applicable.

Merchandise Exports of PNG

Papua New Guinea's major merchandise exports include agricultural products, forest products and minerals. Table -1 presents product-wise as well as total value of merchandise exports of PNG between 1990 and 2010 in millions of Kina. The important observations from this table include:

The value of total merchandise exports increased from K 1390.5 million in 1991 to K15, 579.5 million in 2010 recording an annual growth rate of 51.02%. In fact total exports declined from K15655.6 million to K 11,902.8 million in 2009 due to global economic recession. However, global economic recovery enabled the country to increase its total exports to K 15,579.5 million in 2010. The value of exports of agricultural and related products increased from K 204.6 million to K2961.3 million between 1991 and 2010 recording an annual growth rate of 67.36%. Export of agricultural and related products declined during 2000, 2001, 2006 and 2009.

The value of exports of logs increased from K 81.2 million in 1991 to K 705.9 million between 1991 and 2010 recording an annual growth rate of 38.46%. The growth rate of export of logs was significant during 1992 and 1993. However, it declined during 1998 to 2001 and 2008 and 2009. The value of export of forest products increased from K 90.2 million in 1991 to K 743.7 million in 2010 recording an annual growth rate of 36.22%. The value of export of marine products increased marginally

Table 2. Export of Agricultural Products in Quantities (in thousands of tonnes)

	Cocoa	Coffee	Tea	Copra	Copra Oil	Palm Oil	Rubber
1990	33.9	63.3	5.4	55.3	34.8	142.7	2.3
1991	35.8	46.6	4.7	44.0	33.2	199.6	2.8
1992	38.6	53.0	5.6	47.5	34.8	206.1	2.7
1993	37.8	62.8	6.4	41.8	45.5	245.7	3.6
1994	26.0	64.7	3.4	50.3	34.7	230.8	3.4
1995	30.7	55.1	4.2	64.2	33.1	186.6	2.7
1993	41.0	62.3	9.3	99.2	49.6	267.0	2.8
1997	38.6	59.2	6.5	90.3	48.6	274.9	4.4
1998	26.1	83.5	6.6	58.1	53.2	213.0	4.9
1999	29.0	79.2	8.2	63.5	50.3	253.8	3.7
2000	38.0	66.6	8.5	67.2	48.0	336.3	3.7
2001	36.5	51.6	8.8	46.4	27.1	327.6	3.6
2001	38.0	65.4	7.5	22.3	15.8	309.1	3.8
2002	24.4	45.3	4.0	15.1	16.6	248.4	3.0
2003	40.3	68.8	6.6	8.4	47.7	326.9	4.2
2004	41.5	63.0	8.1	19.2	45.1	339.0	3.8
2005	44.2	72.1	6.9	22.3	54.4	345.8	4.8
2006	44.0	52.3	6.6	12.7	41.5	362.3	4.4
2007	47.8	54.6	6.4	12.6	51.3	368.3	4.1
2008	53.3	67.0	6.1	32.6	62.0	446.0	4.9
2009	48.2	62.2	5.6	15.2	44.8	428.4	5.4
2010	41.3	55.9	4.6	18.6	46.0	485.6	4.6

Source: Quarterly Bulletins for the respective years, Bank of Papua New Guinea.

Table-3: Average annual growth rates of international prices and export prices realised by exporters of Papua New Guinea for the Agricultural Products-during 1991 to 2010.

Agricultural Product	Average annual growth rates of international prices	Export prices realised by the exporters of Papua New Guinea
Cocoa	31.97	38.77
Coffee	27.43	22.37
Copra	29.98	43.19
Copra Oil	31.88	30.43
Palm Oil	33.35	35.91
Rubber	31.91	46.57

Source: Calculated based on the data from Quarterly Bulletins for the respective years, Bank of Papua New Guinea.

from K 10.4 million in 1991 to K 293.2 million in 2008. However, it declined to K 91.7 million in 2010. The growth of exports of marine products was quite erratic during 1991 to 2010.

The value of export of crude oil was initiated in 1992. Exports of crude oil increased from K 301.4 million in 1993 to K 2224.8 million in 2010, recording annual growth rate of 33.85%. However, exports of crude oil declined during 1997, 1998, 2002 and 2009. The value of export of gold increased from K 666.9 million in 1991 to K6380.3 million in 2010, recording an annual growth rate of 42.83%. However, exports of gold declined during 1993,1996,1997 and 2004. The value of export of copper

increased from K 323.8 million in 1991 to K4329. 5 million in 2006, but declined to K3089.3 million in 2010, recording an annual growth rate of 42.70%. However, exports of copper declined during 1996,1997,1998,1999,2000, 2007,2008 and 2009 owing to closure of Bougainville copper mine. (http://epress.anu.edu.au/sspng/mobile_devices/ch13.html).

The value of total export of mineral products like crude oil, gold and copper increased remarkably from K 1005.3 million to K 11,782.8 million between 1991 and 2010, recording an annual growth rate of 53.60%. Annual growth rate of mineral exports by 53.60% between 1991

Table 4: Mineral products exports - quantities exported

	Crude Oil	Copper	Gold
	Barrels	tonnes	Gold
	('000)	('000)	(tonnes)
1990	0.0	196.5	33.6
1991	0.0	192.4	57.8
1992	14547.9	187.9	67.0
1993	45842.6	192.2	59.3
1994	43456.4	207.2	55.8
1995	36990.2	215.7	55.2
1996	39307.7	127.7	46.9
1997	27972.2	77.8	44.3
1998	28033.6	109.5	58.2
1999	30,646.2	143.9	63.0
2000	21,581.7	126.8	72.8
2001	21,369.7	170.1	69.1
	Break in Series		
2001	21,369.7	170.1	69.1
2002	153,705.0	170.1	59.1
2003	14,983.4	230.6	68.4
2004	12,564.7	173.9	67.3
2005	13,299.8	226.1	70.5
2006	14,521.1	216.7	56.7
2007	13,802.8	199.4	57.5
2008	12,185.1	185.7	63.3
2009	10,145.6	153.7	64.0
2010	10,391.9	154.7	61.5

Source: Quarterly Bulletins for the respective years, Bank of Papua New Guinea.

and 2010 contributed phenomenally to the growth of total exports during the period of study. The value of total domestic exports increased from K1310.5 million in 1991 to K 15579.5 million between 1991 and 2010, recording an annual growth rate of 54.44%. Value of total exports increased from K1390.5 million in 1991 to K 15579.5 million during 1991 to 2010, recording an annual growth rate of 51.60%.

Export of Agricultural Products

Table-2 presents the export of agricultural products in quantities. Analysis of the growth of export of agriculture products in terms of quantities indicates that export of cocoa increased from 35,8000 tonnes to 41,300 tonnes between 1991 and 2010 with an average annual growth rate of just 0.77%, while the value increased by an average annual growth rate of 46.12% during the same period. Export of coffee in terms of volume increased from 46,600 tonnes to 55,900 tonnes during the period of study recording an annual growth rate of 1.00% while the average annual growth rate of value of exports of coffee

during the same period was 27.78%. In fact, the volume of exports of tea fluctuated widely and declined in 2010 compared to the figures of 1991. Similarly the volume of copra also declined, but significantly compared to that of tea.

The volume of copra oil increased from 33, 200 tonnes in 1991 to 46,000 tonnes in 2010 with an average annual growth rate of just 1.93% while the average annual growth rate of value of exports of copra oil during the same period was 16.06%. The volume of palm oil exported increased from 199,600 tonnes in 1991 to 485,600 tonnes in 2010 with an average annual growth rate of 7.16% while the growth of palm oil in terms of value increased by 92.59% during the same period. The export of rubber in quantity terms increased from 2,800 tonnes in 1991 to 4,600 tonnes in 2010 with an average annual growth rate of 3.21% while the value of rubber exports increased by 85% during the same period. Thus, it is observed that growth rate of value of exports of agricultural products was far higher than that of quantities, indicating the significant contribution of international prices to the growth of value of agricultural products exported.

Table-5: Indices of Export Prices (as realised by the exporters of Papua New Guinea) of Mineral Products (1994=100.0)

Year	Gold	Copper	Crude Oil	Mineral Index
1994	100.0	100.0	100.0	100.0
1995	120.8	195.8	140.7	148.2
1996	131.0	170.6	170.3	156.6
1997	128.8	141.9	190.7	160.2
1998	166.9	198.6	181.3	176.3
1999	193.1	220.8	282.8	229.2
2000	211.9	264.1	515.7	348.1
2001	245.6	284.9	546.9	376.1
Break Series	in			
2001	245.6	284.9	546.9	376.1
2002	303.9	338.2	585.9	401.8
2003	326.0	344.0	681.3	438.5
2004	327.5	499.5	826.6	502.2
2005	319.5	617.3	1040.7	614.2
2006	433.3	1113.7	1290.7	958.1
2007	506.5	1170.6	1357.8	1008.9
2008	590.9	1085.0	1831.3	1116.9
2009	674.6	732.4	1028.1	759.7
2010	824.4	1116.3	1336.0	993.0

Source: Quarterly Bulletins for the respective years, Bank of Papua New Guinea.

Export Prices of Agricultural Products

Table-3 presents average annual growth rates of international prices and export prices as realised by the exporters of Papua New Guinea between 1991 and 2010. It is observed from this table that the average annual growth rates of international prices and export prices realised by the country were more or less the same in case of copra oil and palm oil between 1991 and 2010. But the average annual growth rate of international price was high in case of coffee compared to that of export price of the country. However, the country had the advantage of higher growth rate of export price compared to that of international price in case of cocoa, copra and rubber. Thus, the country had advantage position in prices of export of agricultural products.

Export of Mineral Products

Analysis of quantities of agricultural goods exported revealed that quantities of certain goods declined over the period from 1991 to 2010 while the increase of other products was marginal. Against this background an attempt is made to analyse the growth of exports of mineral products in terms of quantities. Table-4 depicts the growth of export of mineral products in terms of quantities between 1991 and 2010. It is observed from

this table that the exports of crude oil declined from 14,547,900 barrels to 10,391,900 barrels during 1992 to 2010 with an average annual decline rate of 1.50%.

Export of copper declined from 192400 tonnes in 1991 to 154700 tonnes in 2010 with an average annual decline rate of 0.98%. Export of gold increased from 57.8 tonnes in 1991 to 61.5 tonnes in 2010 with an average annual growth rate of 0.32%. Thus, among the non-agricultural products, average annual exports of quantities of marine products was highest followed by logs and gold. But the exports of quantities of other non-agricultural products declined during the period of the study.

Despite the decline in the export of certain non-agricultural products in terms of quantities, the value of exports increased. This might be due to increase in the export prices. Table- 5 presents export price indices of non-agricultural products like gold, copper and crude oil.

It is observed from this table that export price of gold increased by an average annual growth rate of 45.28%, while that of copper was 63.52% between 1994 and 2010. Export price of crude oil increased by an average annual growth rate of 77.25% between 1994 and 2010. Thus the growth rate of export price of crude oil was highest among the mineral products. Consequently, mineral index increased by 893% between 1994 and 2010 with an average annual growth rate of 55.81% during the period of study. Thus, it is clear that the increase in international prices of mineral products

Table-6: Value of export of agricultural products after eliminating the impact of price changes. (K in millions)

Year	Value of Export of agricultural products	Price Index 1994=100.00	Value of exports of agricultural products after eliminating Price changes	Impact of Price on the Value of Export of agricultural products	Percentage impact of Price on the Value of Export of agricultural products
1994	879.3	100	879.30	0.00	0.00
1995	964.4	131.9	731.16	233.24	22.19
1996	1069.3	129	828.91	240.39	22.48
1997	1220.4	154.8	788.37	432.03	35.40
1998	1235.6	218.4	565.75	669.85	54.21
1999	1461.3	245	596.45	864.85	59.18
2000	1298	191.8	676.75	621.25	47.86
2001	1211.4	179.6	674.50	536.90	44.32
2002	1593.4	270.3	589.49	1003.91	63.00
2003	1932.1	292.7	660.10	1272.00	65.84
2004	2409.6	279.1	863.35	1546.25	64.17
2005	2619.2	255.9	1023.52	1595.68	60.92
2006	2371.3	255.7	927.38	1443.92	60.89
2007	3148.2	369.7	851.56	2296.64	72.95
2008	3800.1	466.3	814.95	2985.15	78.55
2009	2845.8	398.6	713.95	2131.85	74.91
2010	3796.7	458.1	828.79	2967.91	78.17

Source: Calculated based on the data from Quarterly Bulletins for the respective years, Bank of Papua New Guinea.

Table-7: Value of export of mineral products after eliminating the impact of price changes. (K in millions)

Year	Value of Export of mineral products	Price Index 1994=100.00	Value of exports of mineral products after eliminating Price changes	Impact of Price on the Value of Export of mineral products in Millions of Kina	Percentage impact of Price on the Value of Export of mineral products
1994	1782.7	100	1782.70	0.00	0.00
1995	2435.4	148.2	1643.32	792.08	32.52
1996	2244.6	156.6	1433.33	811.27	36.14
1997	1838.9	160.2	1147.88	691.02	37.58
1998	2452.1	176.3	1390.87	1061.23	43.28
1999	3524	229.2	1537.52	1986.48	56.37
2000	4443.7	348.1	1276.56	3167.14	71.27
2001	4895.6	376.1	1301.68	3593.92	73.41
2002	4774	401.8	1188.15	3585.85	75.11
2003	5890	438.5	1343.22	4546.78	77.19
2004	6007.5	502.2	1196.24	4811.26	80.09
2005	7651.9	614.2	1245.83	6406.07	83.72
2006	10459.3	958.1	1091.67	9367.63	89.56
2007	10910.6	1008.9	1081.44	9829.16	90.09
2008	11855.5	1116.9	1061.46	10794.04	91.05
2009	9057	759.7	1192.18	7864.82	86.84
2010	11782.8	993	1186.59	10596.21	89.93

Source: Quarterly Bulletins for the respective years, Bank of Papua New Guinea.

contributed to the growth of value of mineral exports as in case of export of agricultural products.

Influence of Prices

Value of export earnings of merchandise is determined

by international prices, exchange rate fluctuations and volume of exports. However, an attempt is made to analyse the impact of the price changes. The value of each of the as well as total merchandise exports are discounted by the export price index of the respective product and total merchandise exports in order to eliminate the influence of export prices on the value of

Table 8. Value of total merchandise exports after eliminating the impact of price changes. (K in millions)

Year	Value of total merchandise products Exports	Price Index 1994=100.00	Value of total merchandise Exports after eliminating Price changes	Impact of Price on the Value of total merchandise Exports	Percentage impact of Price on the Value of total merchandise Exports
1994	2662	100	2662.00	0.00	0.00
1995	3399.8	143.5	2369.20	1030.6	30.31
1996	3313.9	148.5	2231.58	1082.32	32.66
1997	3059.3	158.4	1931.38	1127.92	36.87
1998	3687.7	190.7	1933.77	1753.93	47.56
1999	4985.3	234	2130.47	2854.83	57.26
2000	5741.7	315.2	1821.61	3920.09	68.27
2001	6107	343.3	1778.91	4328.09	70.87
2002	6367.1	377.4	1687.10	4680	73.50
2003	7822.1	407.3	1920.48	5901.62	75.45
2004	8417.1	459.8	1830.60	6586.5	78.25
2005	10271.1	550.3	1866.45	8404.65	81.83
2006	12830.6	857.3	1496.63	11333.97	88.34
2007	14058.8	911.6	1542.21	12516.59	89.03
2008	15655.6	1005.8	1556.53	14099.07	90.06
2009	11902.8	694.5	1713.87	10188.93	85.60
2010	15579.5	896.2	1738.40	13841.1	88.84

Source: Quarterly Bulletins for the respective years, Bank of Papua New Guinea.

merchandise exports. An attempt is made to eliminate the impact of price on the value of exports of agricultural products. Table -6 presents the value of export of agricultural products after eliminating the impact of price changes.

It is observed from Table-6 that the value of exports of agricultural products increased from K 879.3 million in 1994 to K 3796.7 million in 2010. The value of export of agricultural products after eliminating the influence of price changes, increased to K 879.3 million in 1994 to K1023.52 million in 2005, but declined to K 828.79 million in 2010. Thus, it is felt that the impact of price on increase in the value of exports of agricultural goods was to the tune of K 2967.91 million in 2010. The percentage of impact of price on the value of exports of agricultural products ranged up to 78.17 Table -7 presents the value of export of mineral products after eliminating the impact of price changes.

It is observed from Thable-7 that though the exports of mineral products increased from K 1782.7 million in 1994 to K11, 782.8 million in 2010, the value of export of mineral products after eliminating the influence of price changes, declined from to K 1782.7 million in 1994 to K1186.59 million in 2010. This indicates the decline in volume of exports of mineral products. Thus, it is felt that the impact of price on increase in the value of merchandise exports of mineral products was to the tune of K 10,596.21 million in 2010. The percentage of impact of price on the value of exports of mineral products

ranged up to 91.05 in 2008 and 89.93 in 2010.

Table -8 presents the value of total merchandise exports after eliminating the impact of price changes.

It is observed from Table-8 that though the total merchandise exports increased from K 2662.00 million in 1994 to K15579.5 million in 2010, the value of total merchandise exports after eliminating the influence of price changes, declined from to K 2362.00 million in 1994 to K1738.40 million in 2010. This indicates the decline in volume of total merchandise exports.

Thus, it is felt that the impact of price on increase in the value of total merchandise exports was to the tune of K 13,841.1million in 2010. The percentage of impact of price on the value of exports of total merchandise ranged up to 90.06 in 2008 and 88.84 in 2010. Against this background an attempt is made to analyse the trends in volume of merchandise exports of Papua New Guinea.

Total volume of exports of Papua New Guinea declined by 4.1% (average annual decline rate of 0.26%) during 1994 to 2010. But the value of exports increased by an average annual growth rate of 30.32% during 1994 to 2010. This is exclusively due to increase in export prices by an average annual growth rate of 49.76% during 1994 to 2010.

Export prices of non-mineral products increased by an average annual growth rate of 22.38%, where as the volume of exports of non-mineral products increased by an average annual growth rate of just 2.75% during 1994 to 2010. Thus, increase in value of exports is mostly due

to increase in the price of the non-mineral products.

CONCLUSION

Value of export earnings of merchandise is determined by international prices, volume of exports and exchange rate fluctuations. However, an attempt is made to analyse the impact of the first two factors on the value of exports. It is observed that the growth rates of quantities of agricultural exports were marginal; the average annual growth rates of value of exports were encouraging and ranged from 92.59% in case of palm oil and 12.36% in case of tea. It is thus concluded that phenomenal increase in international prices of agricultural products exported by the country was mostly responsible for the growth in the value of exports of agricultural products.

Export prices of mineral products increased by 1016.9 in 2008. The prices of mineral products increased by 893% between 1994 and 2010. The growth rates of copper and crude oil were higher than that of the average growth rate of all mineral products exported by Papua New Guinea during the same period. Growth of value of exports of mineral products was mostly due to increase in international prices. Thus, increase in prices contributed significantly to the growth in the value of merchandise exports of the country. Hence, it is suggested that Papua New Guinea should craft and implement strategies to export value added products rather than primary products in order to enhance the real value of exports by getting the advantages of terms of trade as well as to

industrialise her economy in view of decline in quantities of exports.

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