



Measuring Competitiveness in the Jamaican Economy

Prepared by Chandar Henry

October 2001**

Abstract

The Bank of Jamaica currently uses the real effective exchange rate (REER) with the Consumer Price Index as the deflator to undertake an internal assessment of Jamaica's external competitiveness. It is, however, recognised that this measure may not sufficiently capture the full extent of movements in the country's external competitiveness. In this regard, this paper assesses Jamaica's external competitiveness over the period 1986 to 2000 employing a menu of measures. The paper estimates indicators of competitiveness, discusses their measurements and highlights any observable trends. Indicators used in this analysis include real effective exchange rates, the profitability of producing tradables, a ratio of the price tradables to non-tradables and the ratio of the trade balance to total trade. The results indicate a general decline in Jamaica's external competitiveness between 1986 and 1999. A key observation of the analysis is that depreciation in the exchange rate does not necessarily lead to an improvement in Jamaica's external competitiveness.

JEL Classification Numbers: F4

Keywords: effective exchange rates, external competitiveness

***The analysis and conclusions drawn are the sole responsibility of the Author and not necessarily those of the Bank of Jamaica.*

Introduction

The core business of the Central Bank is the design and implementation of monetary policy that is consistent with price and financial stability. A critical input in this exercise is the determination of an exchange rate path that is consistent with policy objectives and economic fundamentals. A country's exchange rate is a function of its demand for and supply of foreign currencies, which is directly related to its trade in goods and services. The balance on trade in goods and services of a country is a function of its ability to sell its produce, or its relative competitiveness.

An economy A, has some degree of competitiveness if it can find another country B, that is willing to purchase its products. This will happen if country A can sell its product at a price P_A , which is less than or equal to the price of the products of other countries, P_B , given homogeneous quality. In theory, if a country can produce a commodity at a price PL^* , where $PL^* = (PF - g)$, and g is a very small number, an infinite quantity will be demanded *ceteris paribus*. Hence, this is the objective of all competitive economies.

The price at which a producer sells his products is a function of his production cost. The major components of production cost (C) are that of labour (w) and capital (r), that is $C = f(w, r)$. Given the relatively small size of the Jamaican economy, capital is largely imported and the domestic market supplies labour. The cost of labour is a function of the exchange rate e , in the short run, and in the long run it is a function of the exchange rate and the CPI (c)¹. That is $L_c = f(e, c)$ where e is defined as the amount of US dollar it

¹ As shown in 'Labour Market and Price Behaviour in Jamaica', Bank of Jamaica Research Papers 2000.

takes to purchase one Jamaica Dollar. Labour cost is positively related to c . A primary variable in wage negotiation is price movement in the local economy, which is captured by movements in the CPI.

A nominal depreciation in the exchange rate will result in an exporter receiving an increase in Jamaica Dollars for his goods, assuming that the foreign revenues received remains constant. If his cost does not increase, or if the increase in cost is less than the increase in Jamaica Dollar revenues he received for the goods, the profitability of his organization has improved. Thus, he can reduce his price and maintain the same profit margin, which implies the competitiveness of his firm has improved. If this is a rational producer, he can reduce the foreign price of his product, which should result in increased demand. This will result in a further increase in profit and foreign currency inflows if the price elasticity of the demand for his commodities is greater than unity. With the above-mentioned nominal depreciation in the exchange rate, there may also be a reduction in the country's imports. This increase in exports augmented with the decline in imports will result in an increase in the country's foreign assets.

The above suggests that it is a good thing to have a nominal depreciation. However, the above mechanism is premised on the cost to the producer remaining constant or increasing at a slower rate than the rate of nominal depreciation in the local currency.

The Bank of Jamaica infers changes in the competitive position of the economy from movements in a trade weighted real effective exchange rate that uses the consumer price

index in each partner country as a proxy for prices. It is important to highlight that a unique measurement of international competitiveness does not exist. Therefore, in determining fluctuations in the relative competitiveness of an economy, researchers analyse the behaviour of many indicators, as one indicator may not provide a complete analysis of the country's performance.

The objective of this study is to identify additional measures that are capable of capturing changes in the international competitiveness of the Jamaican economy with the intention of augmenting the present measure used by the Central Bank. The study will examine various indicators of cost to producers and look at their behaviour relative to the nominal exchange rate. These indicators will reveal if the increase in costs to the producers are greater than the increased revenues obtained when there is a nominal depreciation.

The analysis of production cost can be done either at the micro level by examining the cost of each component of the production process, or, by examining the macroeconomic indicators of cost within the economy. Due to the difficulty in obtaining information on production cost at the micro level, the paper employs macroeconomic indicators of production costs. Some of these cost indicators are consumer price indices, GDP deflators and labour costs.

Given that production costs and nominal exchange rates are also changing among trading partners, it is the relative movements in these indicators that are important to this study. We will also estimate labour productivity and profitability in the tradable sector of the

economy, approximated by the manufacturing sector. This will be followed by an estimation of the internal competitiveness of the economy by examining the evolution of the ratio of the prices of tradable to non-tradable goods and also the ratio of the trade balance as a proportion of total trade.

The results indicate a general decline in Jamaica's external competitiveness between 1986 and 1999. A key observation of the analysis is that depreciation in the exchange rate does not necessarily lead to an improvement in Jamaica's external competitiveness.

The remainder of the paper is divided into four sections. Section I provides a brief description of the literature on external competitiveness. Section II expounds on the methodologies employed in this analysis. Section III discusses the results and the final section highlights the conclusion drawn from the results obtained.

1. Literature Review

There is no unique measure that accurately gauges the competitive position of a country. This was reinforced by Turner and Van 't dack (1993), who did an extensive analysis of methodologies used in identifying movements in economic competitiveness. Measuring external competitiveness is analogous to determining the welfare of a population; because there are many dimensions to both of these concepts cocktail of indicators provides a more comprehensive assessment of the direction of change.

The concepts of effective exchange rate indices (EERs) and real effective exchange rate indices (REERs) emerged following the collapse of the Bretton Woods system in the early 1970's. The EER indices provide information on variations in a country's exchange rate relative to that of a number of other countries in a given time period, employing a weighted average exchange rate for the country relative to its trading partners. An increase in the real effective exchange rate index of a country suggests that its economy has experienced a loss in competitiveness. The converse is also true. Turner and Van 't dack (1993) indicated that real effective exchange rates are the most popular indicators of competitiveness used in international trade, as they provide valuable information concerning fluctuations in a country's ability to compete in the international market. Real effective exchange rates are calculated by deflating nominal effective exchange rates using the appropriate deflators. Turner and Van't dack (1993) disaggregated the main deflators in terms of cost and price. The price indices that were employed included

relative export prices, consumer prices and wholesale prices. The indicators of cost included GDP deflators and labour cost.

These deflators were, however, found to have limitations. In particular, export prices may be an inappropriate deflator for developing countries as they are usually price takers in these markets. Therefore, the results obtained from such an indicator may not contain reliable information on the country's competitive position. However, since this indicator only contains the price of goods that are actually traded, it eliminates uncompetitive goods that are not traded. Turner and Van't dack (1993) suggested that the consumer price index eliminate this deficiency as it contains all tradable commodities, as well as goods that are in fact non-tradables, which influence the price of tradables.

Marsh and Tokarick (1994) argue, however, that the consumer price index have the disadvantage of being influenced by distortions such as taxes, subsidies or price controls. Commenting on labour cost, they suggested that this indicator does not account for changes in productivity. This problem they argued, could be solved by the use of unit labour cost; however, this indicator does not contain information on technological improvements. The authors indicated that technological improvements are very costly, thus a change in unit labour cost may not perfectly correlate with total production cost. With respect to the GDP deflators, Marsh and Tokarick indicated that they contain information that influences the price of tradables. However, they found that GDP deflators were too heavily weighted by non-tradables that are consumed and do not affect the price of tradables. Each indicator should therefore be interpreted with caution as they

contain proxies for the cost of production that could bias the degree and direction of changes in the indices.

Many researchers have developed additional indicators of international competitiveness based on the well established principle that the incentive to trade is driven by the relative price of traded to non-traded goods. Marsh and Tokarick (1994) noted that as the price of traded goods (P_T) increase relative to the price of non-traded goods (P_N), producers will have an incentive to increase their production of tradable goods and reduce their production of non-tradable goods. This will also result in a reduction in the consumption of tradable goods. With a reduction in the consumption of tradable goods augmented with an increase in its production there should be an improvement in the country's external position. From the above, movements in P_T/P_N can also influence the movement of resources between traded and non-traded sectors and therefore provide useful information on the competitiveness of an economy. Turner and Van't dack (1993), however, indicated a deficiency in this methodology, noting that an increase in per capita income is usually followed by a decline in the relative price of tradables, which does not represent a loss in competitiveness.

Another variable employed in determining movements in external competitiveness is the profitability of producing tradables. Turner and Van 't dack (1993) in their analysis used the manufacturing sector as a proxy for the tradable sector of the economy. An improvement in competitiveness would imply improved profitability in the production of tradables and vice versa.

An additional indicator of external competitiveness utilized by researchers is the ratio of a country's trade balance to total trade. The United Nations Economic Commission for Latin America and the Caribbean (UN ECLAC) in a workshop on competitiveness and standards in the Free Trade Areas of the Americas in December 1999 employed this indicator. This ratio can vary from -1 to +1. A value of +1 indicates that the economy only exports in this industry, implying strongly competitive and a value of -1 indicates only imports indicating weak competitiveness. This indicator, however, has the disadvantage of being influenced by price movements, and price distortions, in particular taxes and subsidies.

2. Measuring Competitiveness

This section provides a description of the various measurements of competitiveness employed in this paper. Estimates of real effective exchange rates, unit labour cost, profitability of producing tradable goods, ratio of tradable to non-tradable prices and a ratio of the trade balance to total trade will be discussed in the section.

I. Real Effective Exchange Rates

Real effective exchange rates (REER) are the most frequently used indicators of fluctuations in the competitiveness of countries. This methodology provides a suitable means of analysing the relative movements of macroeconomic indicators of costs and prices, between a country and its trading partners. In calculating effective exchange rates, it is important that an appropriate weighting system and definition of the exchange rate be employed. There are two alternative definitions of the exchange rate, the price of

domestic currency in terms of a foreign currency and the price of the foreign currency in terms of the domestic currency. We will denote the price of one unit of the i^{th} trading partner's currency at time t , in terms of the domestic currency by R_{it} . The price of the domestic currency at time t in terms of the i^{th} trading partner currency will be represented by S_{it} ($S_{it} = 1/R_{it}$).

In terms of weighting systems, the most popular are the arithmetic and the geometric weighting systems. Thus, with two definitions of the exchange rate and two weighting systems there are four options for computing effective exchange rate (EER) indices:

$$EER1_t = 100 \sum w_i S_{it}$$

$$EER3_t = 100 \Pi (S_{it})^{w_i}$$

$$EER2_t = 100 / \sum w_i R_{it}$$

$$EER4_t = 100 / \Pi (R_{it})^{w_i}$$

In the calculation of the above, the arithmetically weighted indices EER1 and EER2 can vary significantly. However, both geometrically weighted indices EER3 and EER4 are identical. For the purpose of differentiating between the two arithmetic indices, EER2 is referred to as a harmonic index. In general, arithmetic indices are greater than harmonic indices with the corresponding symmetric geometric indices at magnitudes above the harmonic indices, but below the arithmetic. Thus, due to its symmetric nature, the geometric weighting system has become standard in calculating real effective exchange rates.

The construction of the above indices requires appropriate weights for each trading partner. Data from the balance of payments, in particular the data on trade in goods and

services, are usually used to weight the different currencies. We can calculate both export and import indices, as well as overall trade indices. An export-weighted index is calculated by weighting each currency by the share of exports to that country.

$$W_i^x = X_i / \sum X_i$$

Where X_i = Export to country i
 $\sum X_i$ = Total exports
 W_i^x = Proportion of total exports to country i

Import indices are also calculated from weights generated by their share of imports to the local economy.

$$W_i^m = M_i / \sum M_i$$

Where M_i = Import from country i
 $\sum M_i$ = Total imports
 W_i^m = Proportion of total imports from country i

The overall weight given to a particular country, W_i^t can be calculated from a simple average or a weighted average of the import and the export weights.

$$W_i^t = (W_i^x + W_i^m) / 2$$

or

$$W_i = W_i^x V_x + W_i^m V_m$$

where

$$V_x = \sum X_i / (\sum X_i + \sum M_i)$$

and

$$V_m = \sum M_i / (\sum X_i + \sum M_i)$$

It is important to highlight that a country's exchange rate is usually expressed in terms of a major international currency such as the US dollar and bilateral rates for most currencies are not usually quoted. Thus, in most cases, bilateral rates have to be calculated. In this study all exchange rates obtained are linked to that United States dollar. Bilateral rates were obtained from the following relationships.

$$R_i = R_n/R_{ip}$$

$$S_i = R_{ip}/R_n$$

Where

R_i = the amount of the local currency per unit of the i^{th} trading partner's currency

R_n = the amount of the local currency per US dollar

R_{ip} = the number of units of the i^{th} trading partner's currency per US dollar

S_i = the number of units of the i^{th} trading partner's currency per local currency.

It should be noted that for Jamaica, six trading partners contribute to approximately 80 per cent of its economic trade. The remaining 20 per cent of international trade is spread across many economies (Appendix II). Therefore in calculating EERs, only trade weights relating to ten (10) major trading partners are used in calculating the above indices for Jamaica.

Having established the nominal effective exchange rate the real effective exchange rate is calculated by adjusting the EER by choosing the appropriate deflators. The deflators generally used are indices of CPI, GDP deflators, wage index, wholesale and export price indices. In this exercise, the deflators chosen are wage indices, GDP deflators and the CPI. Export prices were excluded as given the contractual nature of the prices of major

exports; the country is a price taker in this market. Wholesale prices, are also omitted because of data unavailability.

The wage index, GDP deflators and the CPI will be used in the calculation of the arithmetic, geometric and harmonic indices. Imports, exports and total trade will weight the calculation of these indexes. The indices are defined thus:

Geometric Index	$REER = 100\Pi(S_{it}/P_{it})^{w_i}$
Arithmetic Index	$REER = 100\Sigma w_i(S_{it}/P_{it})$
Harmonic Index	$REER = 100/(\Sigma w_i R_{it} * P_{it})$

where:

S_{it} = an index of the price of the home currency in terms of the i^{th} trading partner's currency at time t

R_{it} = an index of the price of one unit the i^{th} trading partner's currency at time t in terms of the currency of the home country.

P_{it} = ratio of the price index of the i^{th} trading partner in period t to the price index of the home country in period t (with the same base year as that used to calculate S_{it})

w_i = normalized weight of the i^{th} trading partner's currency

II Unit Labour Cost in the Manufacturing Sector

One of the major cost in the production process is that of labour. Thus unit labour costs contain vital information on fluctuations in a country's external competitiveness. In this analysis, the labour cost of producing one unit of manufactured good was calculated for the period 1986 to 1999. This was measured by dividing nominal value-added in the manufacturing sector by the total compensation to employees.

$$ULC = \frac{VA}{52 * AS * E}$$

Where

VA = Nominal value-added in the manufacturing sector

AS = Average cost per employee per week

E = Employed labour force in the manufacturing sector.

III Profitability of Producing Traded goods

Another indicator of competitiveness is a measure of profitability in producing tradable goods, in particular manufactured goods. Improved competitiveness should allow domestic producers of tradable goods greater profits and hence increased production.

$$PR = YM/ULC$$

Where

PR = Profitability of The Manufacturing Sector

ULC = Index of nominal unit labour cost in Manufacturing

YM = Value added deflator for manufacturing

In analysing the profitability of producing traded goods, labour productivity was also calculated. This was calculated by dividing the real output of the sector by the employed labour force within the sector.

IV Ratio of tradable to non-tradable prices

In estimating this indicator, GDP deflators for the period 1986 to 1999 were used to calculate two price indices, one for tradables and another for non-tradables.

$$RER = P_T / P_N$$

Where

RER = Real Exchange Rate

P_T = Price index of Tradable goods

P_{NT} = Price index of Non-Tradable goods

Export agriculture, mining and quarrying, manufacturing, mainly textiles, and hotels and restaurant were grouped as tradables. Construction and services excluding hotels were considered non-tradable. In calculating the above indices, each sector was assigned a weight corresponding to its contribution to GDP. It should be noted that it is difficult to obtain a precise distinction between the tradable and the non-tradable sectors of the economy. However, each sector contains a majority of either tradables or non-tradable, thus a classification was made.

Due to the lack of national income statistics at frequency greater than annual, and the need for competitive indicators at a greater frequency, the above measure was also calculated using an alternative data set. A price index for the tradable sector was calculated from a value-weighted index of export prices. This was calculated from monthly data for the period January 1997 to December 2000. With respect to the index of non-tradables, the monthly CPI was used as a proxy.

V Ratio of trade balance to total trade

This indicator was calculated using total trade data from 1994 to 2000 and also using monthly data on merchandise trade from January 1988 to December 2000. The series on total trade used in this analysis did not go prior to 1994, as the methodology employed in its estimation then subsequently revised.

$$\text{Trade Ratio} = \frac{(\text{Export Values} - \text{Import Values})}{(\text{Export Values} + \text{Import Values})}$$

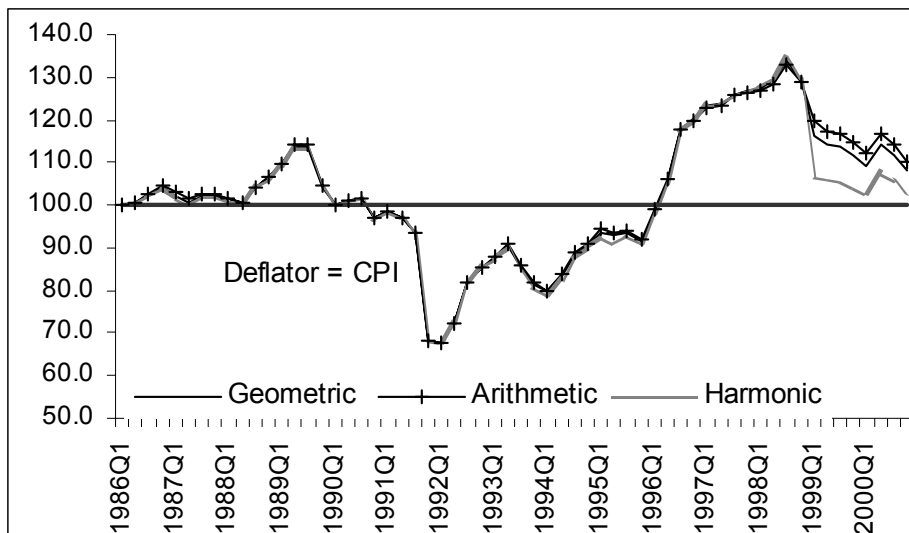
3. Trends in Competitiveness in the Jamaican Economy

The results obtained from the above mentioned indicators of competitiveness suggest a general decline in Jamaica's external competitiveness over the review period with all the indicators suggesting a continuous loss in competitiveness between 1992 and 1998. Since then the GDP deflator and the CPI based REER indices indicate an improved position. The remainder of this section elaborates on the results of each indicator.

Real Effective Exchange Rates

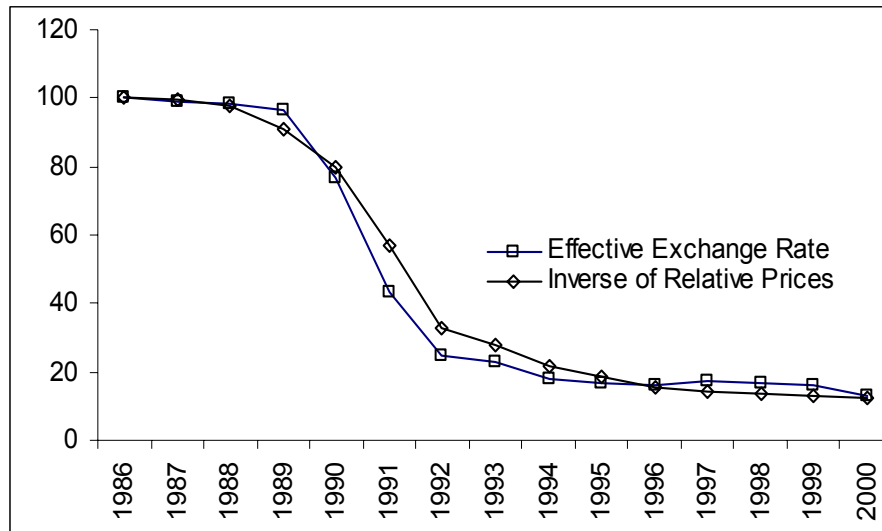
For the period 1986 to 2000, real effective exchange rates deflated by the CPI suggest a decline in Jamaica's external competitiveness. The arithmetic index indicated a loss in competitiveness of 11.2 per cent, while the geometric and the harmonic indices suggested losses of 8.8 per cent and 2.8 per cent, respectively (Figure 1). The import and export indices produced similar results (Appendix I).

Figure 1
Real Effective Exchange Rates Based on Consumer Price Indices



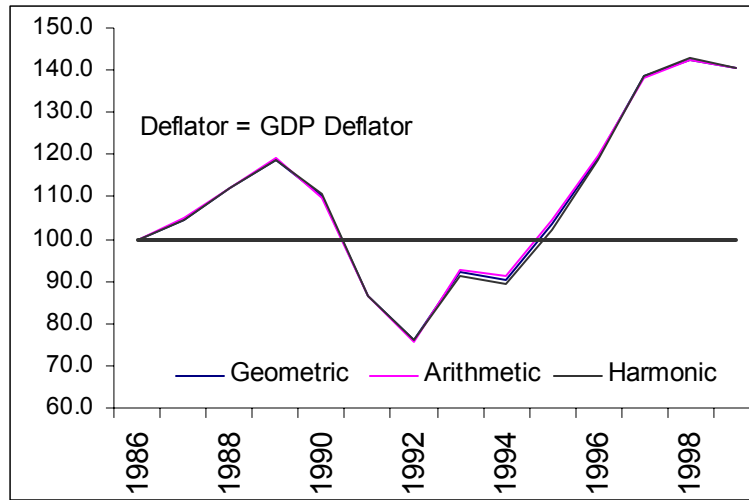
The loss in competitiveness between 1986 and 1989 resulted from depreciation in the nominal effective exchange rate index of 1.9 per cent, and a 16.9 per cent increase in the relative price index (Figure 2).

Figure 2
Graph of Effective Exchange Rate and the Inverse of Relative Prices



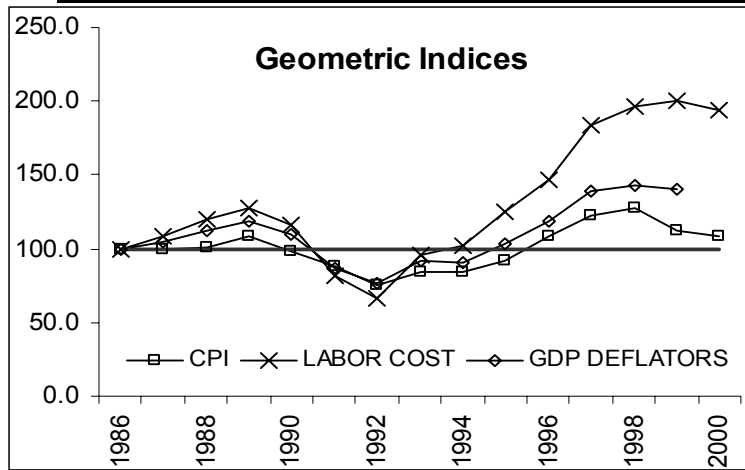
This was followed by continuous improvement until 1992 when there was a sharp turning point in the REER indices. For the years 1993 to 1998 the indices reflected decline in external competitiveness, which resulted from a 33.8 per cent depreciation in the EER index and increases in excess of 100 per cent in relative prices. One factor contributing to the depreciation in the EER was the liberalization of the foreign exchange market in the latter half of 1991. After 1998, the EER index depreciated at a faster rate than the increase in relative prices, which resulted in an improvement in external competitiveness until the end of 2000.

Figure 3
Real Effective Exchange Rates Based on GDP Deflators



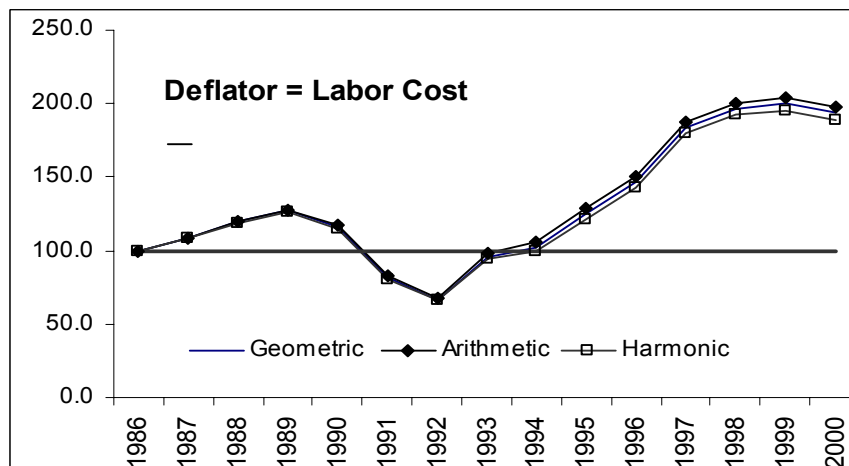
For the period 1986 to 1999 the geometric Index of REER based on the GDP deflator, indicated a loss in competitiveness of 40.3 per cent with the arithmetic and the harmonic indices deteriorating by 40.4 per cent and 40.1 per cent, respectively similar result was obtained from the export and import indices (Appendix I). A comparable pattern was observed in the indices deflated by GDP deflators relative to that obtained when the CPI was used as deflator, albeit, with different magnitudes (Figure 4). The difference in the magnitudes of the indicators resulted primarily from the relative GDP deflators increasing at a faster rate than that of the relative CPIs.

Figure 4
Comparative Real Effective Exchange Rate Indices



The real effective exchange rate deflated by labour cost indicated the most significant decline in Jamaica's external competitiveness over the 14-year period ending 1999 (Figure 4). At the end of the sample period the arithmetic, geometric and the harmonic indices were at magnitudes of 207, 205 and 200, respectively (Figure 5). Between 1986 and 1989 the symmetric geometric indices indicated a loss in competitiveness of 27.0 per cent and an improvement of 37.8 per cent between 1989 and 1992. This was followed by a continuous loss in external competitiveness for the remainder of the sample period.

Figure 5
Real Effective Exchange Rates

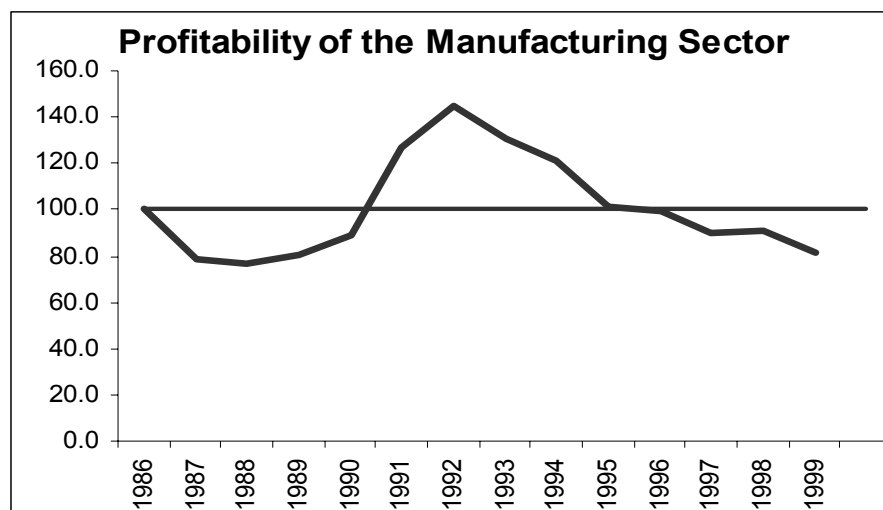


This suggests that over the sample period relative labour cost in the Jamaican economy was increasing at a faster rate than that of relative prices and the GDP deflator. An analysis of labour cost suggests that the increase occurred in all sectors (Appendix I).

Profitability of Producing Tradables (Manufacturing Sector)

The result indicates a general increase in profitability in the sector for the period 1986 to 1992, which was followed by a continuous decline to the end of the sample period (Figure 6).

Figure 6



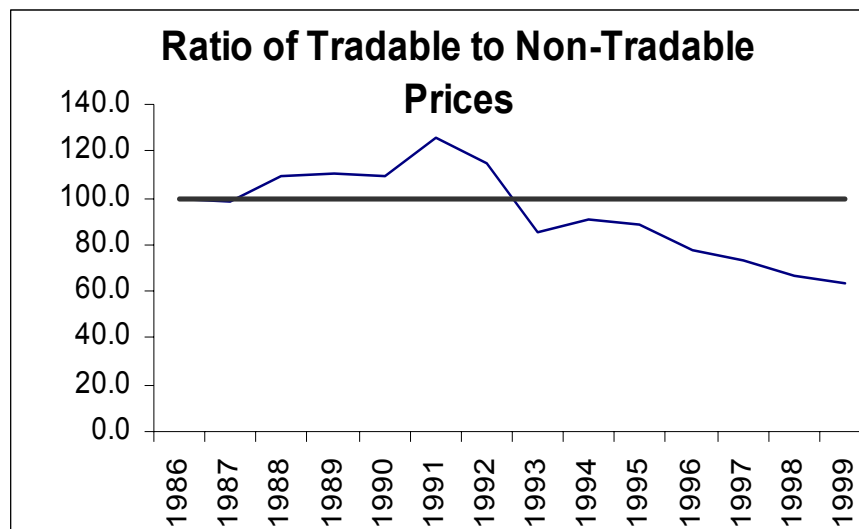
The contraction in profits since 1993 resulted from labour costs increasing at a faster rate than revenues. There was a decline in unit labour cost between 1987 and 1992 when the unit labour cost index was at a value of 69.0 (Appendix I). However, from 1993 to 1999 there was a continuous increase in the index of labour cost to 122.7. An analysis of employment data revealed that there was an increase in employment in the manufacturing

sector between 1986 and 1990 after which there was a general decline to the end of the sample period.

Ratio of tradable to non-tradable prices

The results obtained from this ratio are highlighted in (Figure 6). There was an improvement in competitiveness between 1986 and 1990, which was followed by a decline to the end of the sample period.

Figure 7

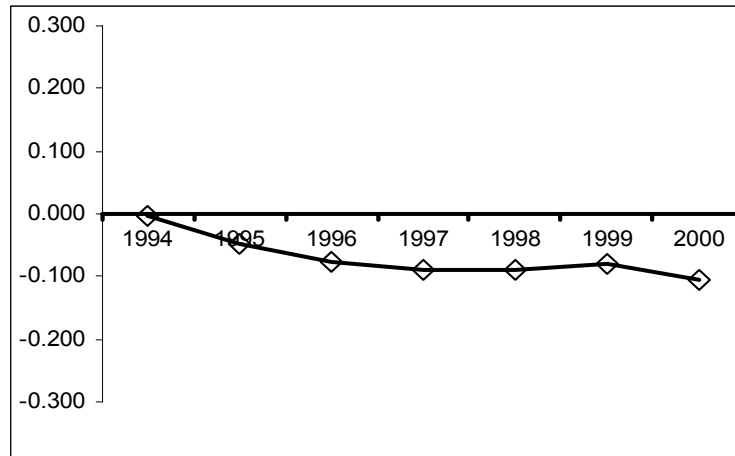


The indicator, which was also calculated using monthly data, suggests a turning point in 1999, with an improvement in competitiveness in 2000 (Appendix I).

Ratio of trade balance to total trade

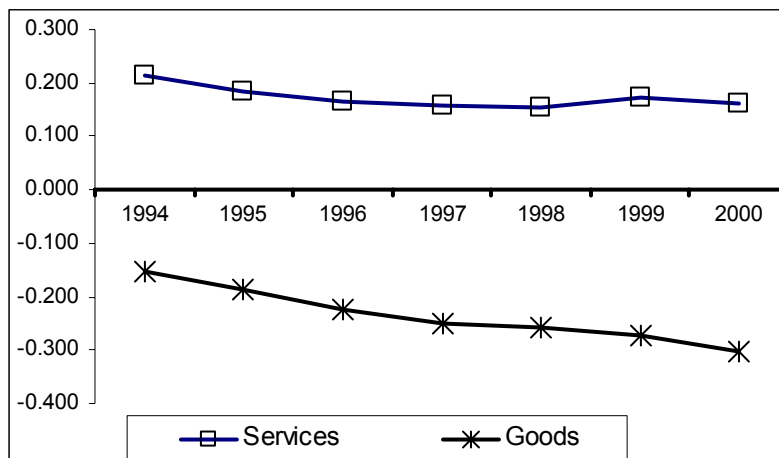
The ratio of the trade balance in goods and services to total trade in goods and services over the period 1994 to 2000 revealed a general decline in Jamaica's external competitiveness over the seven-year period (Figure 8) with this indicator recording an average value of -0.07 .

Figure 8
Overall Trade Balance as a Proportion of Total Trade



In an attempt to better understand this result, total trade was disaggregated and the indicator was also calculated for its major components. That is, the indicator was calculated for goods and services (Figure 9), merchandise trade and travel.

Figure 9
Trade Balance in Goods and Services as a Proportion of Total Trade in Sub-Group



The results indicated a general decline in the competitiveness of both the goods and the services sectors. For the seven-year period ending 2000, the goods sector recorded an average value of -0.24 for this indicator, with the more competitive services sector, registering an average value of 0.17. Within the services sector, the dominant factor that influenced its result was the positive performance of its largest component travel, which recorded an average value of 0.75 for the indicator during the sample period. With regard to the goods sector, the indicator showed an average value of -0.30 for merchandise trade.

As a result of the indicated performance of merchandise trade, monthly data for the period 1988 to 2000 was used to calculate the competitiveness indicator for its components (Appendix I). Over the period, the competitiveness indicator recorded an average of -0.34 for total merchandise trade (Figure 7). The table below shows the average of the indicator value for components of trade by SITC over the sample period. It indicated that the components of merchandise trade are relatively uncompetitive, with the exception of crude materials (average of 0.84) and beverage & tobacco (average of 0.26).

Table 1
Average Ratio of Deficit to Total Trade

0.FOOD	-0.19
1.BEV. & TOBAC	0.26
2.CRUDE MATS.	0.84
3.MINERAL FUEL	-0.94
4.ANI.& VEG OIL	-0.97
5.CHEMICALS	-0.77
6.MANUF. GOODS	-0.93
7.MACH. & EQUIP	-0.98
8.MISC. MANUF. GOOD	-0.26
9.MISC. COMMDS	-1.00
TOTAL	-0.34

Of concern is the general loss in competitiveness in the production of manufactured goods and food products, which both recorded trade deficits during the entire sample period. The commodity groups that maintained trade surpluses were crude materials and beverage & tobacco. Crude materials exhibited a positive trend during the entire sample period. However beverage & tobacco started its positive trend in 1997 and continued until the end of the sample period with an increasing slope.

4. Conclusion and Recommendations

Between 1986 and 2000 there was a general decline in the external competitiveness of the Jamaican economy, with marginal improvement in the final three years, despite an 87.0 per cent depreciation in the effective exchange rate. In theory, depreciation in a country's exchange rate should result in an improvement in competitiveness through a reduction in cost to the producers. However, the results from this analysis suggest that the macroeconomic indicators of cost to producers, such as the relative CPI and the relative

GDP deflator increased on average at a faster rate than the depreciation in the exchange rate. As a result, the potential gain in external competitiveness from the depreciation in the exchange rate was eroded.

A number of structural changes occurred in the economy in 1992. These changes were consequent on the liberalisation of the foreign exchange market, the removal of subsidies, price controls, wage guidelines and certain taxes within the early 1990's. The changes were implemented in an attempt to improve the external competitiveness of the economy. In spite of these measures, after 1992 all indicators reflected a loss in competitiveness, which continued until 1998. Of importance, during the latter years of the sample period, there was a reduction in the rate of depreciation in the exchange rate and inflation. This coincided with deceleration in the loss in competitiveness, reinforcing the positive relationship between exchange rate stability, low inflation and the competitiveness of the economy. This reinforces the Monetary Authority's stance of lowering inflation and engendering exchange rate stability.

The results obtained from the indicator based on the trade balance, as a proportion of total trade appears to be consistent with the indicators of costs to producers. The depreciation in the exchange rate over the period did not produce a reduction in the trade deficit. Indeed, there was an increase in both imports and exports with the former growing at a faster rate than the latter. This literature on international trade asserts that depreciation in the exchange rate should result in an increase in exports and a reduction in imports.

A possible factor contributing to the increase in the trade deficit was the increase in the price of non-tradables relative to the price of tradables. As a result producers obtained greater profits in the production of non-tradables. This could have influenced some producers to channel their resources towards the production of these commodities. Therefore, within the set of policies targeting price stability, greater emphasis needs to be placed on the sub-set of policies, which targets the price of non-tradables.

The external Competitiveness of the economy was further eroded by real increases in wages over the period. An analysis of labour costs deflated by the exchange rate indicates a significant increase over the sample period (Figures XI to XIX). The most significant changes occurred in basic services, in which real labour cost increased by over 300 per cent. This increase in real wages may be the primary factor contributing to the increase in the price of non-tradables relative to the price of tradables. Policies must therefore be developed with the objective of reducing the rate of increase in real wages. A possible policy prescription that could achieve this objective is to reform labour and income policies.

Of note, during the years 1986 to 1991 there was a positive trend in the rate of growth in GDP, which coincided with a period in which there was an increase in the relative price of tradables. There was a decline in the rate of growth in GDP during the years 1992 to 1995, which was followed by negative growth between 1996 and 1999. A possible explanation for the reversal of the positive trend in GDP is that, with the significant increase in the relative price of non-tradables (Figures 6), the relative profitability of

producing tradables declined. This fall in profitability could have resulted in the contraction of various industries. An analysis of monthly data indicates a gradual increase in the relative price of tradables from March 1999 to the end of the sample period, December 2000. This coincided with growth in real GDP in 2000.

All indicators of competitiveness employed in this analysis produced similar results, with different magnitudes in their variations. This would suggest that a better understanding of external competitiveness could be obtained from the analysis of many indicators. There may be shocks to data, which are used in the calculation of a particular indicator that may not influence another indicator. Therefore a variety of indicators are required to minimise the possibility of being misinformed.

Further work in this area would involve disaggregating the CPI into tradables and non-tradables, as well as a more precise decomposition of GDP into tradables and non-tradables. The series on goods and services could also be extended to 1986. This should enhance the result obtained from the indicators based on the ratio of the price of tradables to non-tradables and also the indicator based on trade ratio.

APPENDIX I

Figures I to III represent real effective exchange rates that are weighted by imports and figures IV to VI represents real effective exchange rates weighted by exports.

Figure I
Real Effective Exchange Rates
Based on Consumer Price Indices
Weighted by Imports

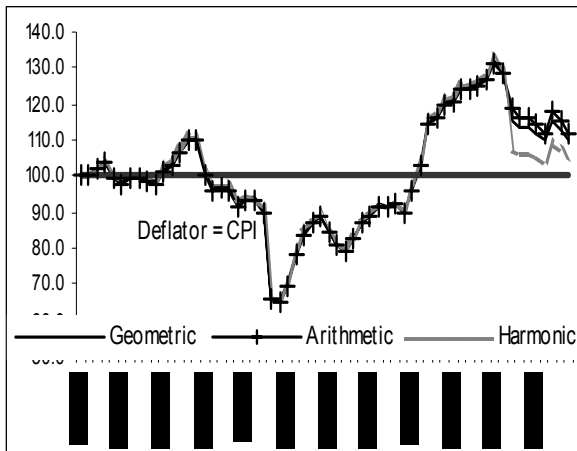


Figure II
Real Effective Exchange Rates
Based on Labour Cost
Weighted by Imports

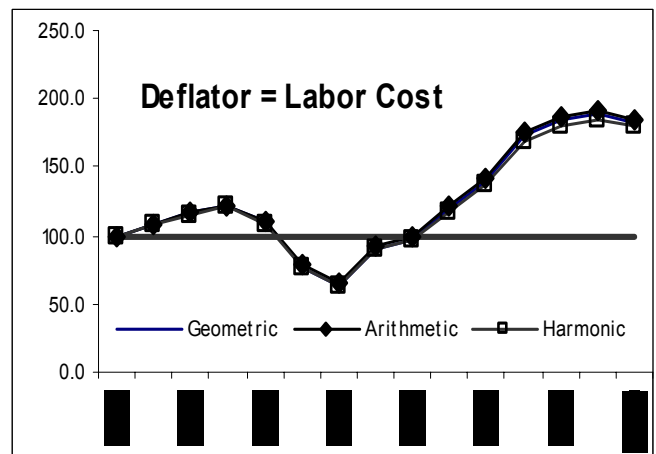


Figure III
Real Effective Exchange Rates
Based on GDP Deflator
Weighted by Imports

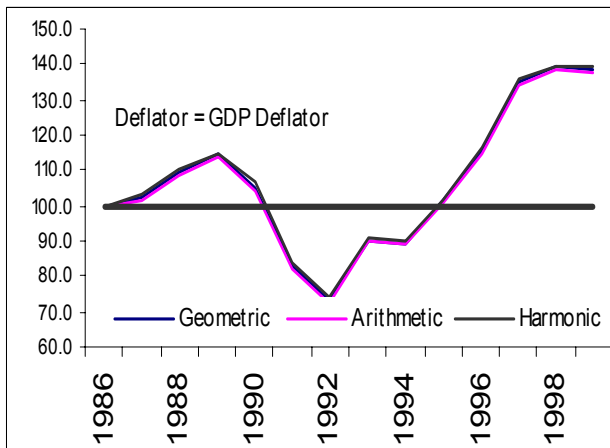


Figure IV
Real Effective Exchange Rates
Based on Consumer Price Indices
Weighted by Exports

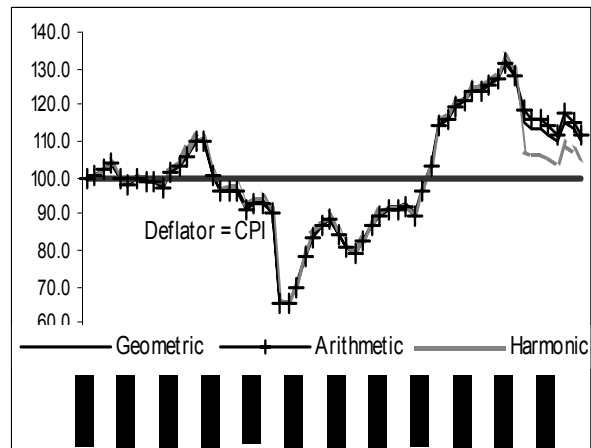


Figure V
Real Effective Exchange Rates
Based on Labour Cost
Weighted by Exports

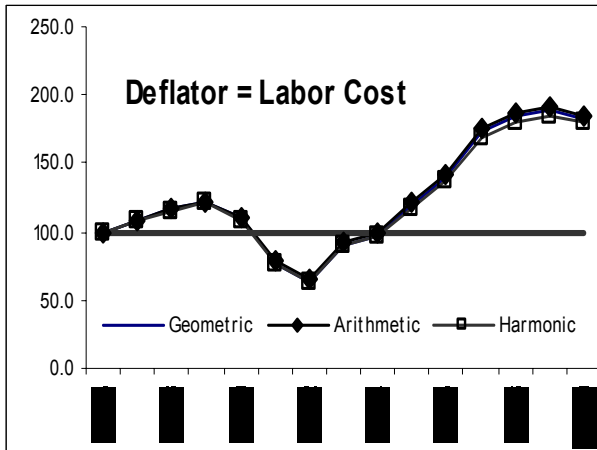
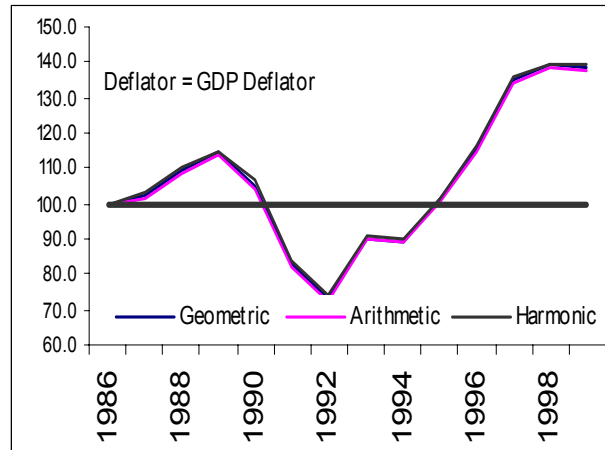


Figure VI
Real Effective Exchange Rates
Based on GDP Deflator
Weighted by Exports



Figures VII to XI highlights the relative competitiveness between Jamaica and its major trading partners.

Figure VII

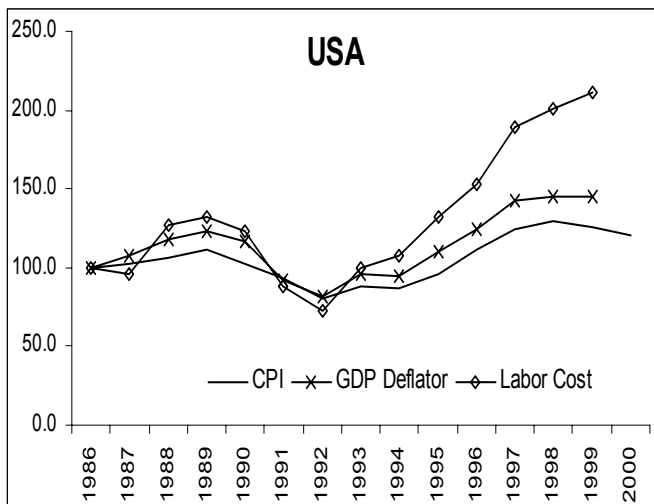


Figure VIII

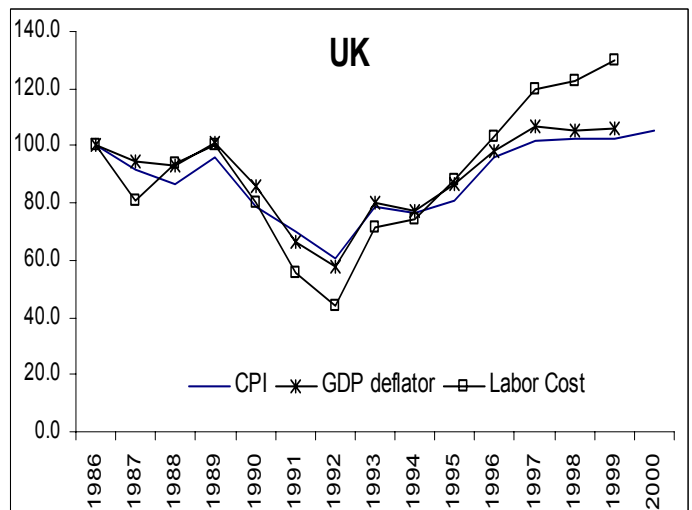


Figure IX

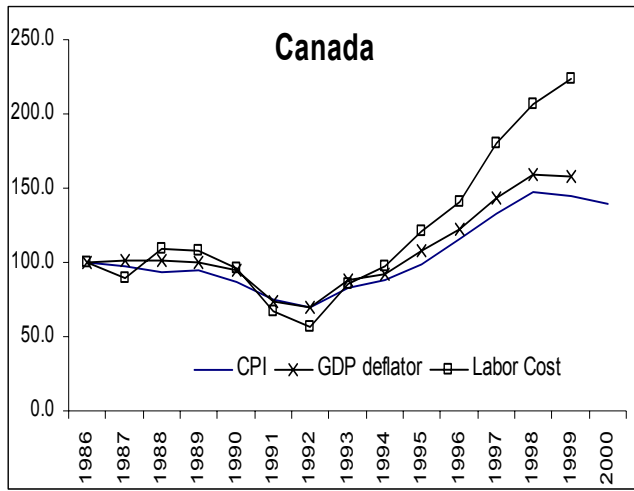


Figure X

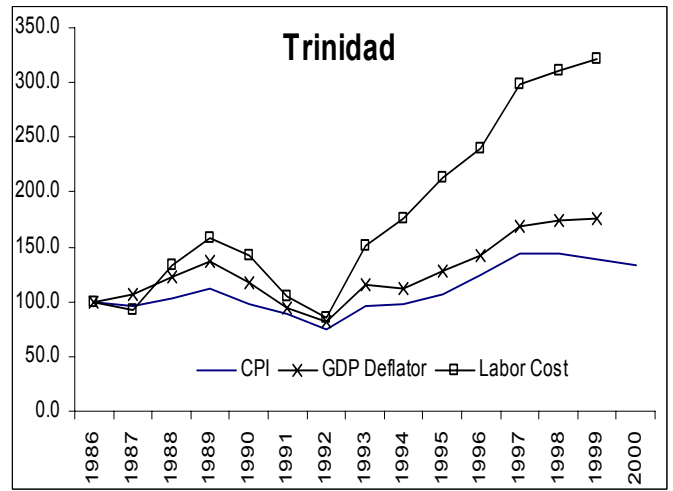
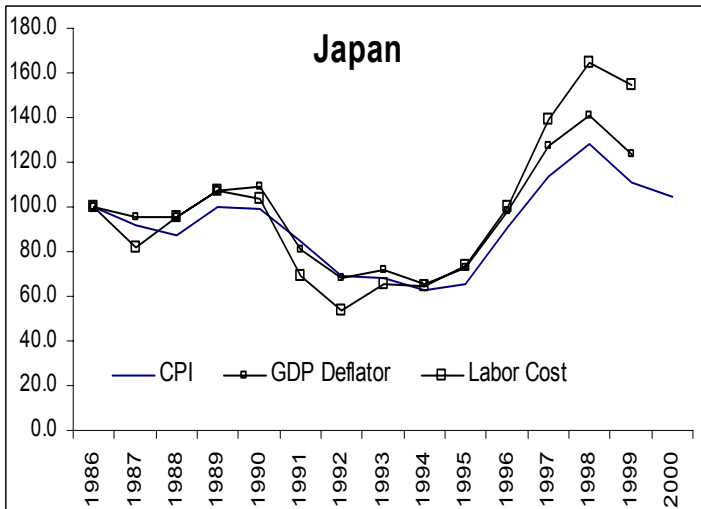


Figure XI



Figures XII to XXIV represents labour cost by sector, deflated by the exchange rate and indexed to 1986.

Figure XII

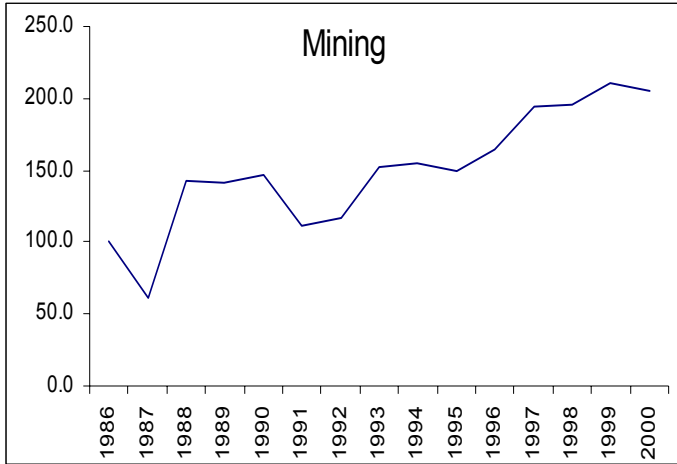


Figure XIII

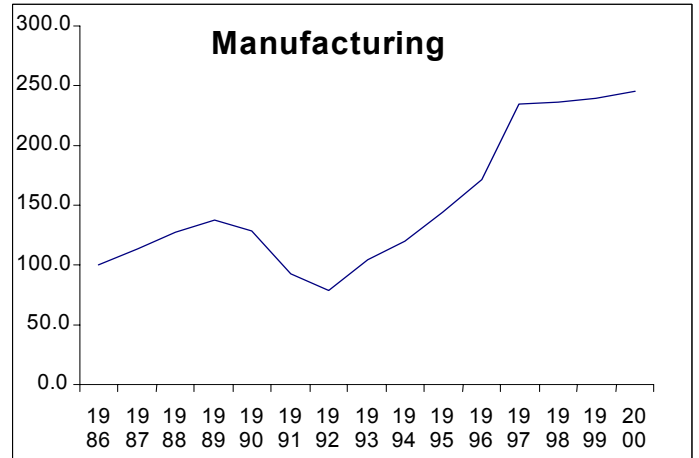


Figure XIV

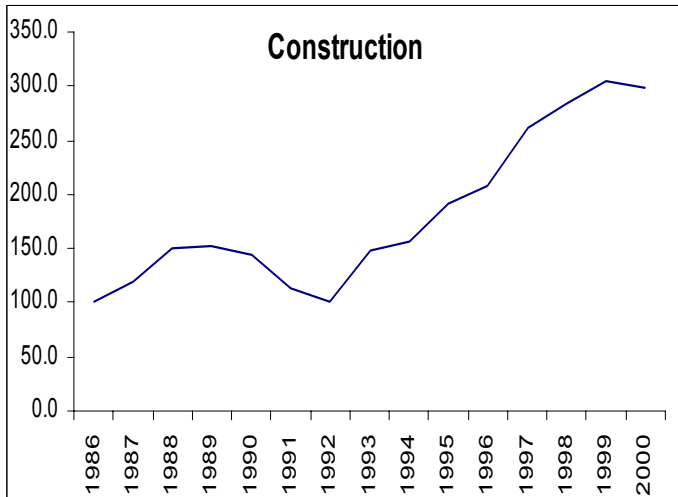


Figure XV

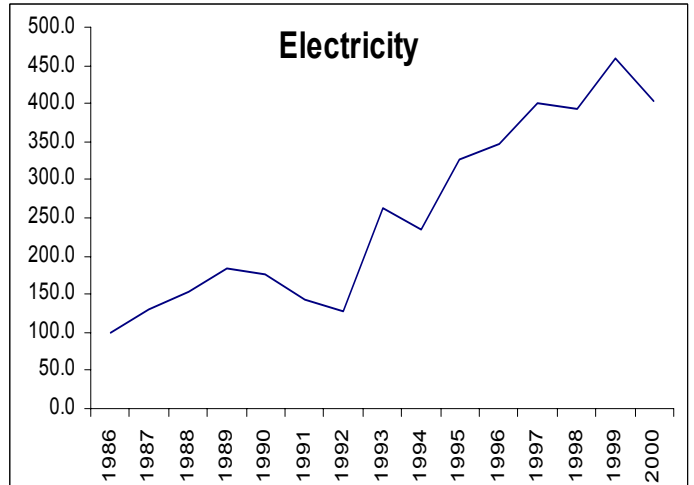


Figure XVI

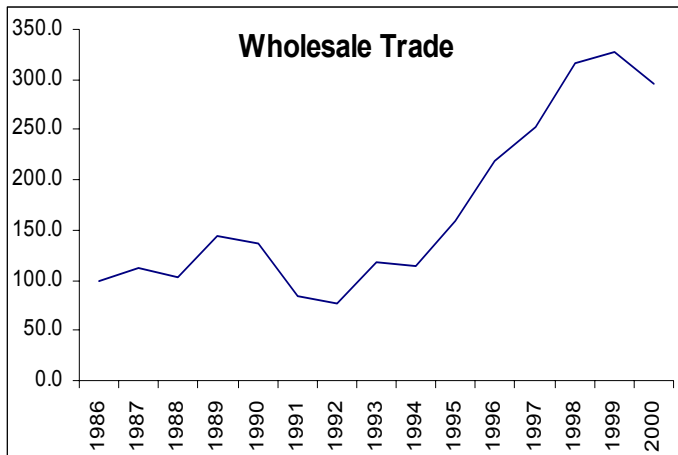


Figure XVII

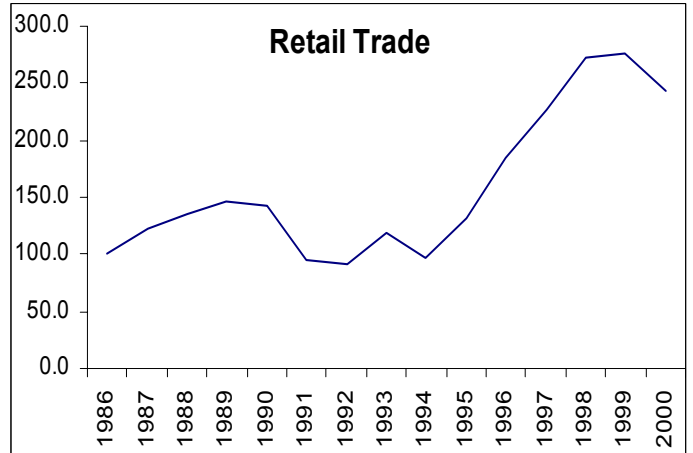


Figure XVIII

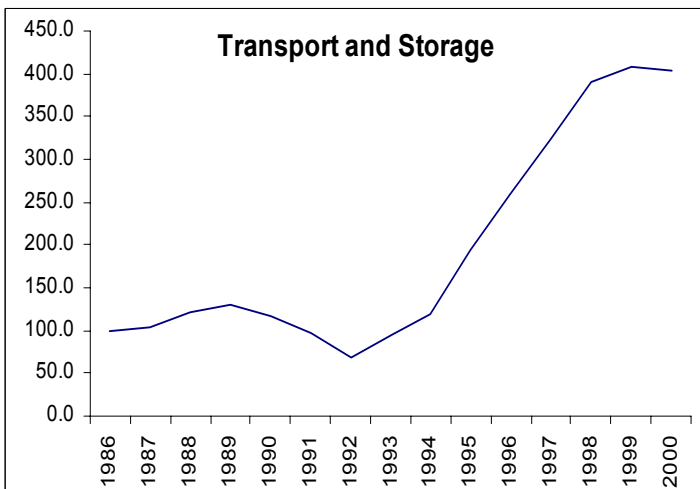


Figure XIX

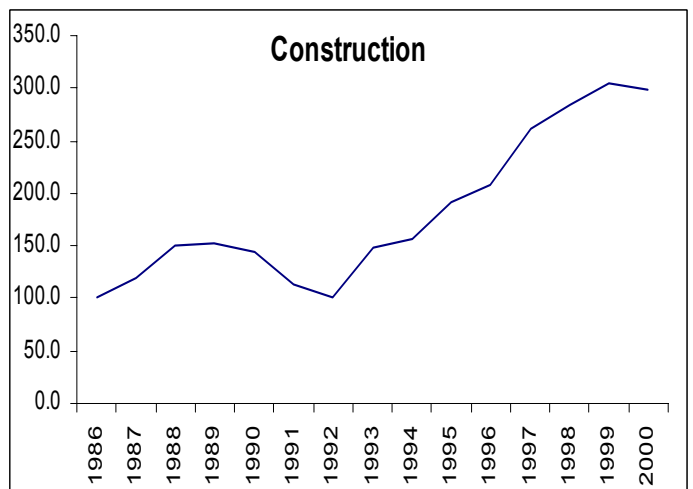


Figure XX

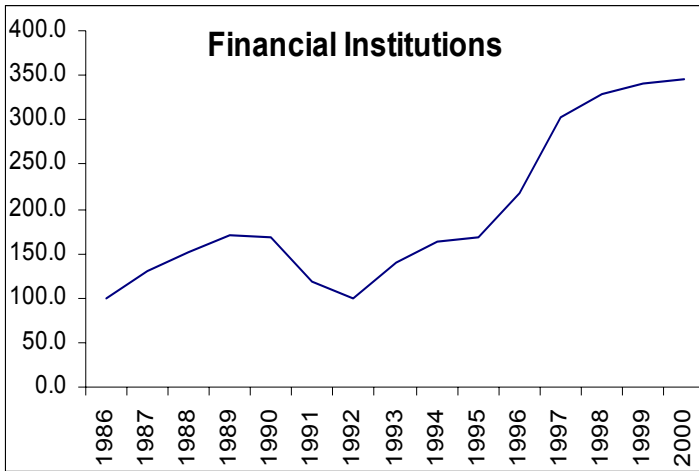


Figure XXI

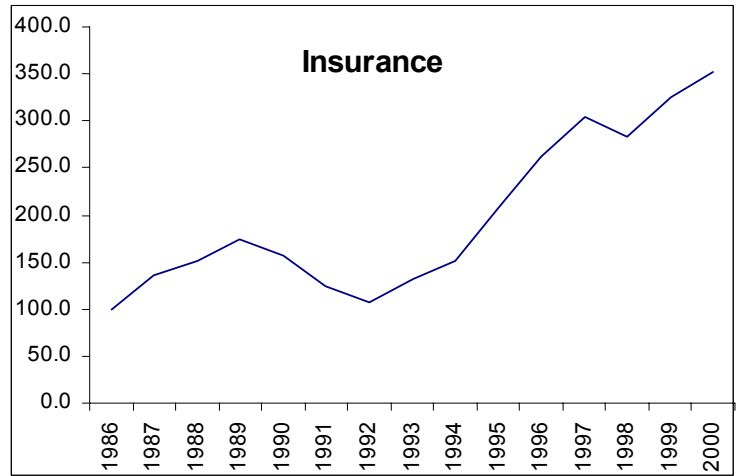


Figure XXII

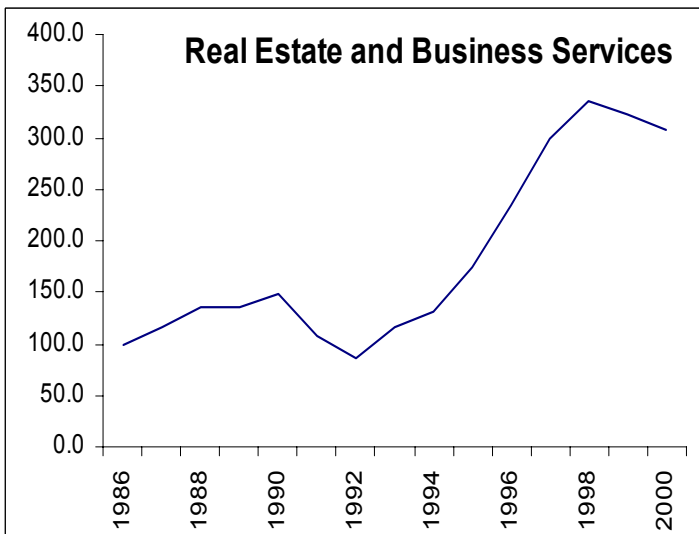


Figure XXIII

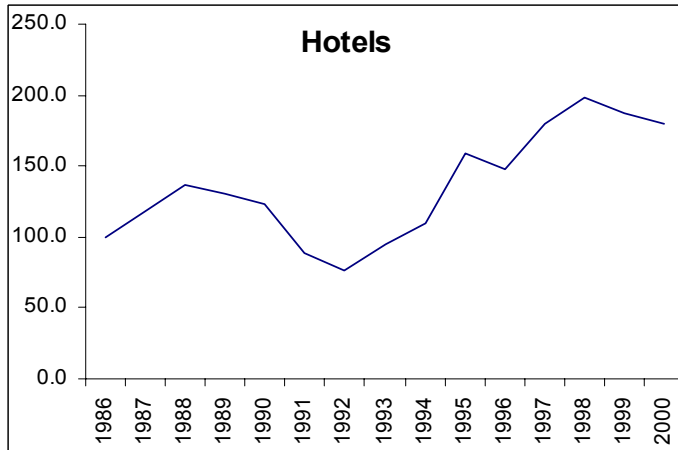
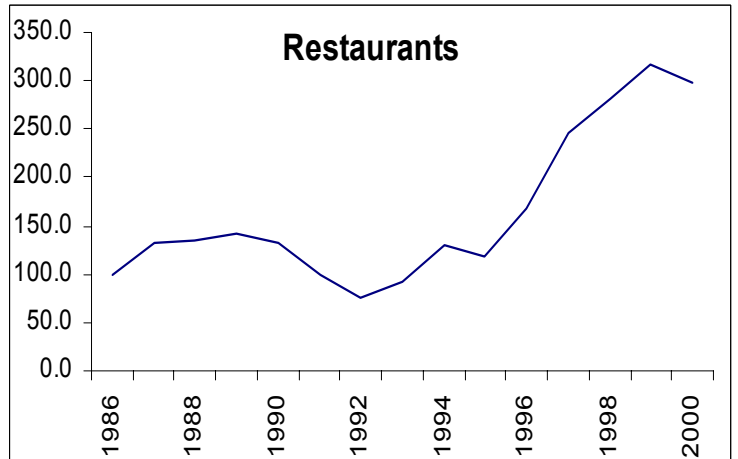


Figure XXIV



Figures XXV to XXVIII refer to the manufacturing sector.

Figure XXV

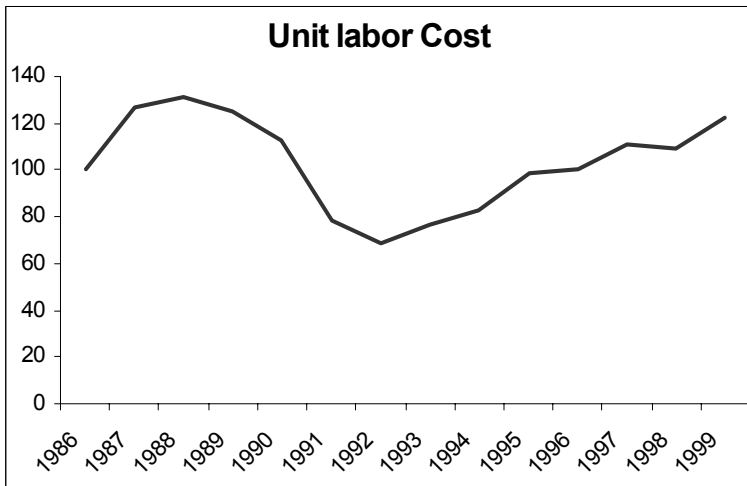


Figure XXVI

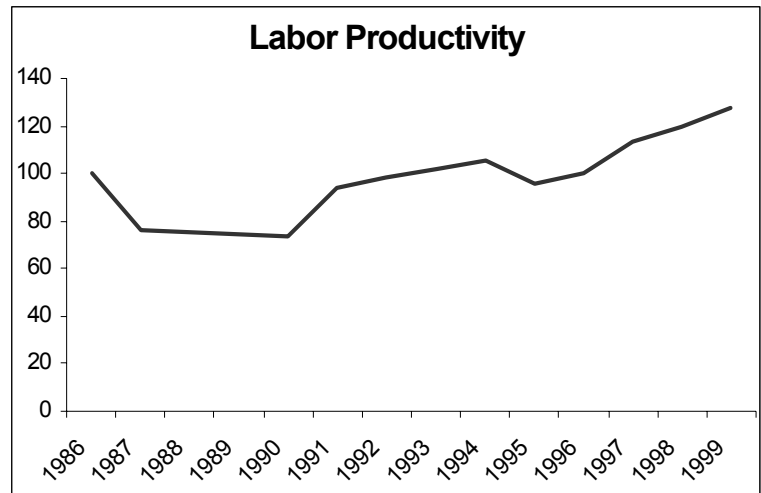


Figure XXVII

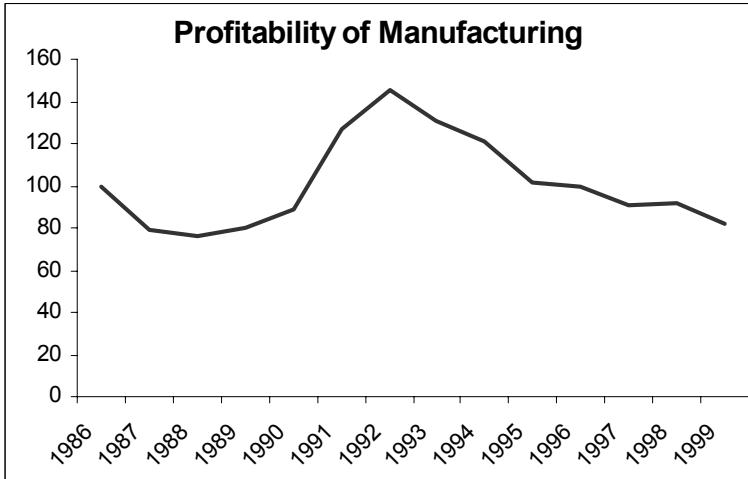


Figure XXIII

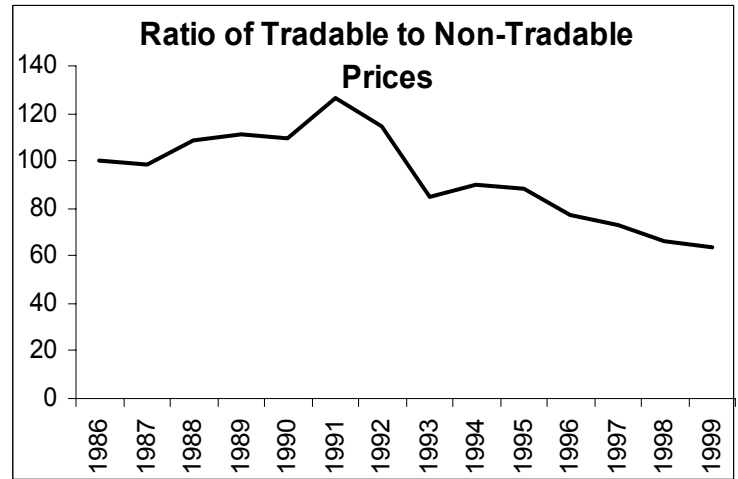


Figure XXIX
Price of Tradables and Non-Tradables



Figure XXX

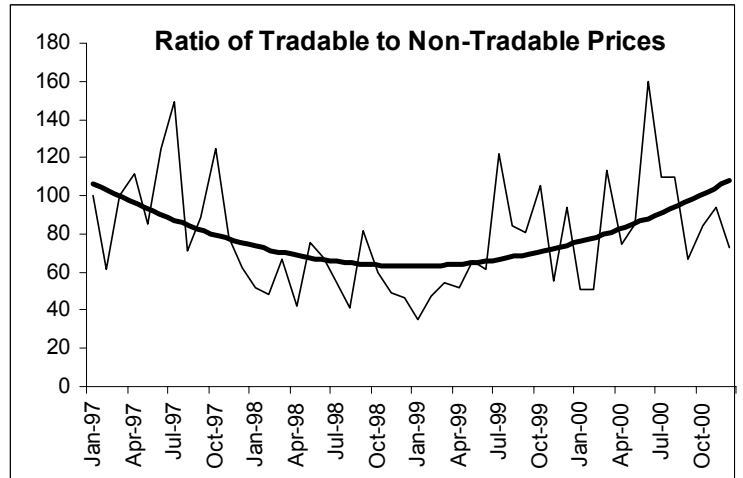


Figure XXXI to XXXVIII illustrate trade balance by commodities as a proportion of total trade in respective commodities and also their respective polynomial trend line.

Figure XXXI

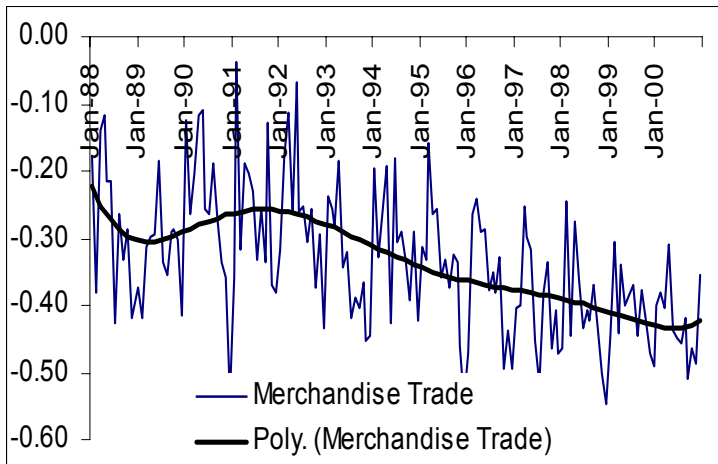


Figure XXXII

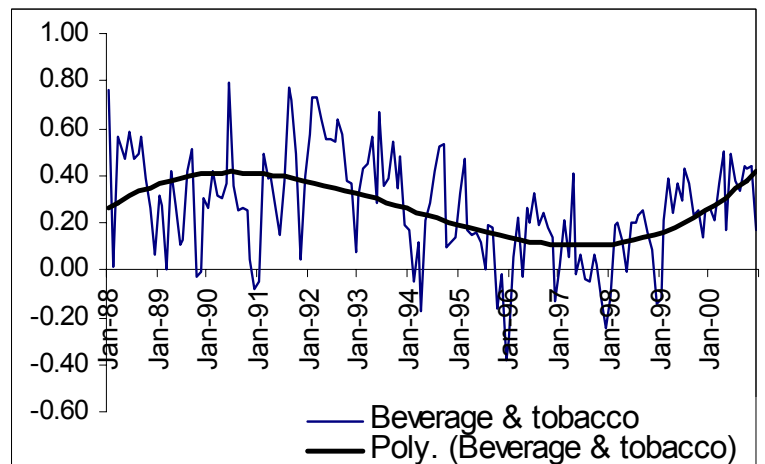


Figure XXXIII

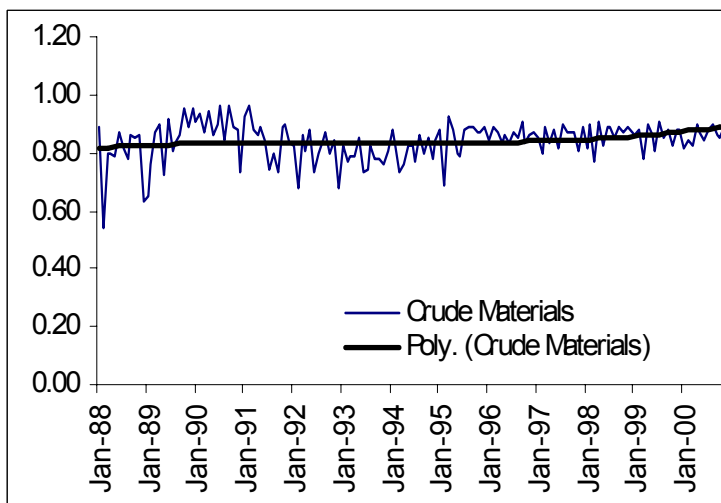


Figure XXIV

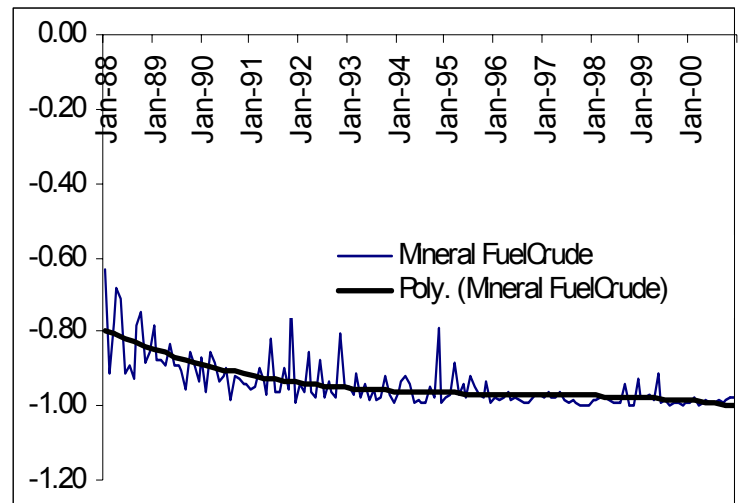


Figure XXXV

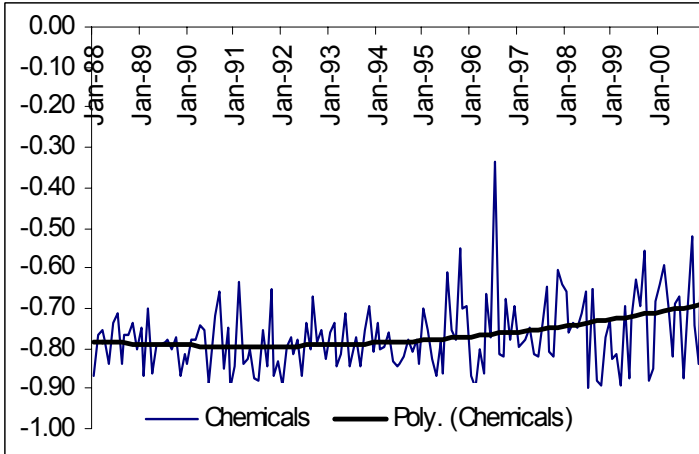


Figure XXXVI

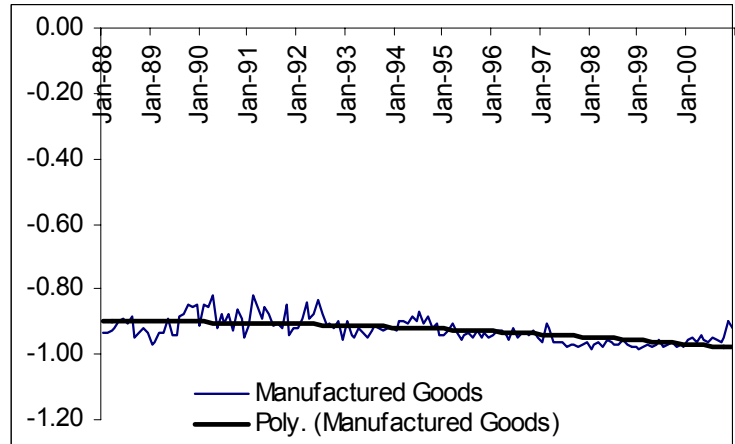


Figure XXXVII

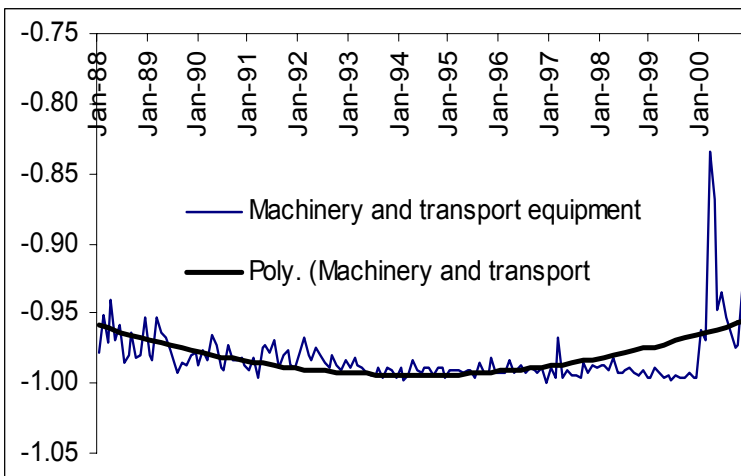
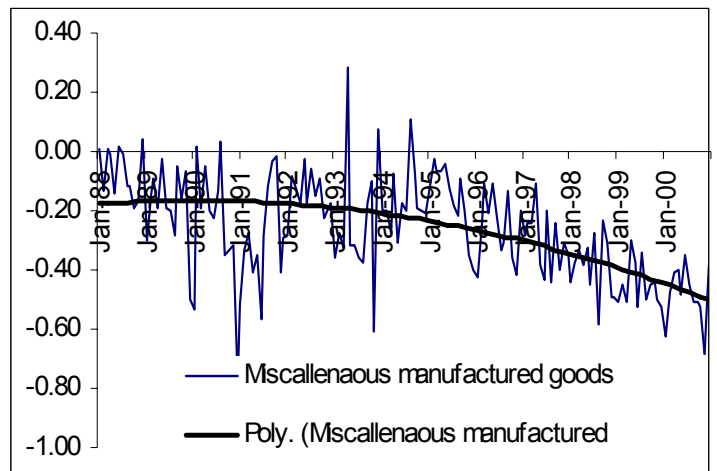


Figure XXXVIII



Appendix II
Percentage Contribution to Trade in
Goods and Services by Trading Partners

Trading Partners	Contribution to total trade in Goods and Services (%)
USA	52.9
EURO	10.8
UK	8.5
CANADA	7.3
T&T	5.0
JAPAN	4.7
NORWAY	2.0
MEXICO	1.6
VENEZUELA	1.3
GHANA	1.1
BRAZIL	0.9
RUSSIA	0.7
BARBADOS	0.6
CHINA	0.5
TURKEY	0.5
SWEDEN	0.5
KOREA	0.4
SWITZERLAND	0.4
GUYANA	0.4

APPENDIX III

Data

Indicators Estimated	Data Sources
Real Effective Exchange Rates	
<ul style="list-style-type: none">• Exchange rates• CPI• Labour cost• GDP deflators• Imports and Exports	International Financial Statistics International Financial Statistics International Financial Statistics National Income and Product Statistical Institute of Jamaica
Profitability of producing tradables	
<ul style="list-style-type: none">• Value-added data• GDP deflators• Labour cost•• Employed Labour force	National Income and Product National Income and Product Employment Earnings and Hours Worked in Large Establishments Labour Force Statistics
Ratio of tradable to non-tradable prices	
<ul style="list-style-type: none">• GDP deflators• CPI• Export prices	National Income and Product National Income and Product Statistical Institute of Jamaica
Ratio of trade deficit to total trade	
<ul style="list-style-type: none">• Imports and Exports	Statistical Institute of Jamaica

References

- Lipschitz, Leslie and Donogh McDonald (1991) "Real Exchange Rates and Competitiveness: A Clarification of Concepts and Some Measurements for Europe," IMF Working paper WP/91/25
- Marsh, Ian W., and Stephen P Tokarick (1994), "Competitiveness Indicators: A Theoretical and Empirical Assessment," IMF Working Paper WP/94/29.
- Richardson, J. David and Chi Zhang (1999) "Relative Comparative Advantage: Coherent Patterns Across Time and Sector and U.S Trading Partners?" NBER Working Paper 7212.
- Robinson, Wane (2000) "Labour Market and Price Behaviour in Jamaica," Bank of Jamaica Research Papers September 2000
- Smith, Harry H. (1988) "U.S Agricultural Export Competitiveness: Exports Levels, Trade Shares, and the Law of One Price," Economic Review-July 1988.
- Turner, Philip and Jozef Van 't dack (1993) "Measuring International Price and Cost Competitiveness," BIS Economic Papers No. 39 - November 1993
- UN ECLAC/CDC (1999) "Report of The Work Shops on The Free Trade Areas of the Americas, Competitiveness and Standards"

Zanello, Alessandro and Dominique Desruelle (1997) "A Primer on the IMF's .
Information Notice System," IMF working Paper WP/97/91.