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EXPORT DIVERSIFICATION AND ECONOMIC GROWTH

Case Study of a Developing Country

Mauritius

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ABSTRACT

The paper analyses the relationship between export diversification and economic growth in Mauritius for the period 1980-2008. Using the Johansen cointegration analysis and the Vector Error Correction Model (VECM), an inverse relationship is found between the export concentration and the economic growth variables. The implication of this finding is that export diversification will lead to higher economic growth. This result therefore calls for the need to promote export diversification by providing the appropriate incentives, dealing with market and information failures, promoting entrepreneurship and discoveries as well as providing a competitive business and regulatory environment in order to enhance and sustain export diversification and thereafter economic growth of Mauritius.

Key words: export diversification, economic growth, time series analysis

1.0 Background

Export diversification has been a recurrent topic in development economics. There is a belief that it is correlated with an acceleration of growth for developing countries (Lederman and Maloney, 2003 and Herzer and Nowak-Lehmann, 2006). High export specialization implies high sensitivity to sector-specific shocks leading to high volatility of export revenues. This may in turn affect the import capability of the country and results in underinvestment when investors are risk averse (Dawe, 1996 and Bleaney and Greenaway, 2001). Moreover ,high concentration limits productivity growth since it does not lead to neither an increase in the efficiency in which inputs are used (Feenstra and Kee, 2004), nor learning by exporting (Al-Marhubi , 2000 and Agosin , 2007).Furthermore , the Prebish-Singer thesis (Prebish 1950 , Singer 1950) argues that vertical export diversification from primary products to manufactures is very important as primary goods generally exhibit a declining terms of trade.[2]

Mauritius is a developing country in the South West of the Indian Ocean with an estimated population of 1.3 million. It became independent of Britain on 12th March 1968 and acceded to the status of Republic on 12 March 1992. During the past thirty years, the Mauritian economy has diversified from a monocrop economy depending on sugar exports in the 1970's to one based on manufacturing of mainly textiles and garments and tourism in the 1980's. Global business (offshore) and Freeport activities have also been growing continuously since the mid 1990s. While the country's main export products remain textile and clothing, the services sector has surpassed the manufacturing sector to become the main contributor to GDP. With sustained GDP per capita growth (average of around 5% per year) since independence, Mauritius has moved to an upper middle income county status.

There is the general belief that export diversification can be used as a promoter of economic growth. However, in Mauritius, assessment of the impact of export diversification on economic growth has received limited attention. This study is therefore justified as it tries to address this issue by analyzing the link between export diversification and economic growth in Mauritius.

[2] See Herzer and Nowak -Lehmann (2006)

Also, the findings of this study will serve to guide government's future policy actions on the export diversification agenda.

2.0 Literature Review

Conventional trade theories suggest that a country should specialize in the production of goods and services in which it has a comparative advantage. Modern trade theory however contends that international trade need to be accommodated with modern industrial characteristics ; the features of which are increasing returns to scale(IRS) and imperfect competition(Helpman and Krugman,1985) .A country cannot solely depend on particular industrial activities and should be more proactive to offset national factor disadvantages (Arip et al, 2010).Export diversification can play a crucial role in fuelling an increase in national output thus leading to higher economic growth and development

Naude and Rossouw (2008) provide an extensive review of the theoretical links between export diversification and economic growth which is summarized thereafter.

Early theories of economic development from Adam Smith to the standard Hecksher -Ohlin-Samuelson model of international trade advocated that countries should specialize in producing and exporting goods according to their comparative advantage to achieve economic development. According to Naude and Rossouw(2008) , seminal contributions including the 'big push' arguments put forward by Rosenstein-Rodan (1943) and the Prebisch –Singer thesis (Prebish , 1950 , Singer 1950) viewed economic diversification rather than specialization as a determinant for economic development. Accordingly, developing countries relying on the primary sector are prone to commodity shocks, price fluctuations and declining terms of trade

and the resulting fluctuations and uncertainty hinders economic planning, reduce import capacity and undermine investment by risk adverse producers (Dawe, 1996).Diversifying exports would therefore assist in stabilizing earnings and provide significant development benefits. (Ghosh and Ostry, 1994; Bleaney and Greenaway, 2001).[3]

Naude and Rossouw (2008) reviews four further stands of literature that were put forward during the 1980s and 1990s to explain the potential effects of export diversification on economic growth. Firstly, they argue that an increase in exports leads to higher growth in line with the export led growth hypothesis as experienced by the South Asian Countries as point out in Alexander and Warwick (2007) that contends that an increase in exports for goods experiencing rising world demand lead to higher growth and is a suitable for developing countries. However, the significance of the export diversification impact will depend on the type of goods that are exported and its consistency with world demand.

The hypothesis of diversification-led development is not necessarily tied to the outward oriented hypothesis. For instance , in the development through industrialization model (Roseinten-Rodan ,1943,Prebish,1950, Singer ,1950, Nurske , 1953) ,infant industries encouraged by protection and import substitution would also increase diversification in the country and since the protection is assumed to be temporary(available only during the infancy stage) , diversification in production eventually leads to diversification in exports.

Secondly, Naude and Rossouw(2008) reviews the endogenous growth theory that sees export diversification from primary commodities into high skilled, high technology manufactured goods as an important lever for growth through productivity gains , manufactured goods

[3] See Naude and Rossouw(2008)

having more positive spillovers as pointed out in Herzer and Nowak-Lehmann (2006). Export diversification encourages knowledge spillovers from improved production techniques , new management and marketing practices into other industries.(Amin Gutierrez de Pineres and Ferrantino ,2000,Al-Marhubi, 2000). Herzer and Nowak-Lemann(2006) also contends that exporting generates a learning process on international markets requirements , quality control and standards , marketing , management and logistics considerations as put forward by Chang(1998) . The endogenous growth model therefore introduced the "beneficial effect of spillovers" with export diversification improving productivity. (Berthelemy and Soderling, 2001, Al-Marhubi, 2000)

In the same line, Agosin (2007) argues that long run growth is associated with learning to produce an expanding range of goods. Growth is viewed by Agosin (2007) as being the result of adding new products that embody productivity change to the production and export basket so that countries that have few local sources of productivity growth benefit by opening new sectors that have higher factor productivity. In the product-cycle literature, innovation by developed countries lead to an increasing variety of products which are imitated by low- wage developing countries so that diversification , export growth and economic growth are linked , knowledge spillovers playing an important role in such a link.

The third strand in the literature as surveyed by Naude and Rossouw (2008) takes a portfolio approach. While acknowledging the Heckser-Ohlin-Samuelson comparative advantage model, they argue that because of uncertainty associated with primary commodities production , risk–averse producers will under-produce.(Ruffin ,1974 , DeRosa, 1991).Export diversification is therefore needed to offset uncertainty if financial institutions that can provide insurance are lacking specially as is the case in many African countries (Chang ,1991, Osakwe,2007).

The fourth strand of the literature pointed out by Naude and Rossouw(2008) deals with what Sachs and Warner (2001) term the ‘natural resource curse .Economies possessing a lot of natural resources, tend to grow slower than more diversified economies. Resource rich countries concentrate on the export of few natural resources like oil , minerals , coffee , diamonds (Arezki and Van der Ploeg, 2007).Three reasons advanced by Naude and Rossouw(2008) for the negative impact of abundant natural resource endowment on growth are: the ” Dutch disease’ phenomenon , rising rent-seeking behavior and corruption and thirdly, civil conflicts. The “Dutch disease” refers to the appreciation of real exchange rates during periods of prosperity which leads to loss of competitiveness by other exporting sectors and capital flight.

Recent seminal contribution to the literature was made by Imbs and Wazziarg (2003). They found a U-shape pattern between domestic sectoral concentration and per capita income across countries .Countries at first diversify and then specialize as they move to higher levels of income. Based on their empirical findings, Imbs and Wacziarg (2003) formulated some theoretical arguments. Economic diversification is initially favored because as income increases, it is expected that economic agents will demand a larger variety of consumer goods and producers invest on a wide range of sectors based on the portfolio argument as developed by Acemoglu and Ziliboti (1997).As pointed out by Hesse (2008), specialisation will later set in at higher income levels because of agglomeration effects and specialization benefits as laid down by the Ricardian trade model.

The entrepreneurial cost-discovery process represents a new stand of literature as propounded by Hausmann and Rodrik (2003) , Hausmann , Hwang and Rodik (2006) , and Hausmann and Klinger (2006).These authors argue that entrepreneurs do not have information on the cost of exporting and penetrating new markets and if their goods are successfully introduced in new

markets , the gains will be socialized but in case of failure , they will have to bear all the losses so that new investment and innovation is suboptimal. On the same line, Vettas (2000) argues that discoveries about foreign demand may not be available to domestic producers[4]. Foreign buyers are made aware of the product only when exporting starts and these information spillovers to other domestic producers. Hesse (2008) argues that imitation in this case lead to higher output and higher growth.

Herzer and Nowak-Lehman (2006) are of the view that empirical work on the export diversification and economic growth relationship remains limited. The number of theoretical links that have been formulated as reviewed in the previous section is however fairly large. The main empirical works in this field are:

Al-Marhubi (2000) using a cross-sectional country growth regression model finds that export diversification promotes growth. Export concentration measures are added to the basic growth equation. De Ferranti et al (2002) arrived at the same findings by also using cross sectional studies.

Amine Gutierrez de Pineres and Ferrantino (2000) using panel data for Latin American countries found a positive link between export diversification and per capita income.

Berthelemy and Chauvin(2000) uses the Cobb Douglas production function which he breaks down to get the contribution of capital , labor and total factor productivity(TFP) of factors , thereafter an econometric regression model is used to consider the factors affecting total factor productivity of which indices of diversification , development finance , economic openness and human capital are retained as explanatory variables. This methodology through the use of total

[4] See Hesse (2008) , Pg 4

productivity of factors shows the contribution of economic diversification to economic growth. (Berthelemy and Chauvin, 2000; Berthelemy and Soderling, 2001). In the same line, Ben Hammouda et al (2009) use panel data estimation to explore the link between TFP and diversification for selected Sub-Saharan African countries. Increasing level of diversification is found to lead to higher total factor productivity therefore higher growth.

On the other hand, a U shape relationship was found by Imbs and Wacziarg (2003) when examining the relationship between domestic concentration and per capita income. Countries diversify initially and then specialize as income increases. Cabellero and Cowan (2006) and Klinger and Lederman (2006) show that this relationship also holds for a countries' export.

Lederman and Maloney (2003) while examining the relationship between trade structure and econometric growth found that countries which have a lot of natural resources grow more slowly because of export concentration rather than dependence on natural resources per se.

Using time series analysis of structural change in exports and economic growth in Spain, Balaguer and Cantavella-Jorda (2004) establish a positive relationship between export diversification and economic growth using cointegration and causality tests. However, Amin Guiterez de Pineres and Ferrantino (2000: Chapter 4, 5), using time series analysis found an inverse relationship between export diversification and growth in Columbia and Chile.[5] However as pointed out by Herzer and Nowak-Lehmann (2006) , the study by Guiterez de Pineres and Ferrantino suffers from several methodological shortcomings including the omission of cointegration tests and the possible presence of structural breaks when testing for unit roots. Normality, autocorrelation and heteroscedasticity tests were not undertaken as well.

[5] See Herzer and Nowak-Lehmann(2006)

ESCAP (2004) used a 2 stage approach to test the relationship between export diversification and economic growth for selected South Asian countries. In the first stage, the linkage between export diversification and export growth was investigated using simple regression models. In the second stage, the long run impact of export growth on the country's real growth was assessed using Granger standard causality tests for testing long-run relationships and direction of causality between export growth and overall growth. Focusing on Bangladesh , Myanmar , Nepal and Malaysia and using long term data (1973-2001) , it found that (i) in Malaysia, both vertical and horizontal diversification variables have a statistically significant impact on total export ;and in Bangladesh and Nepal , only vertical diversification has a statistically significant impact on total exports , while in Myanmar , neither vertical nor horizontal export diversification produced any statistically significant impact on total export growth ;and ii) there was a causality from export growth to real economic growth for all countries.

Using an augmented Cobb-Douglas production function and applying cointegration tests including the Johansen trace test, a multivariate error correction model and a dynamic Ordinary Least Squares (OLS) procedure, Herzer and Nowak-Lehman (2006) found a positive relationship between export diversification and economic growth.

Agosin (2007) develops and tests a model of growth that emphasizes the introduction of new export as the main source of growth in countries that are far within the world technological frontier. Using selected South American countries and Asian exporters of manufactures, he found that export diversification is highly significant in explaining per capita growth over the period 1980-2003 for these countries especially when exports grow rapidly.

Using a dynamic cross-country panel model, Lederman and Maloney (2007) also found a positive relationship between export diversification and economic growth.

Hesse (2008, Pg 1) contends that "the process of economic development is as a process of structural transformation where countries move from producing 'poor country goods' to 'rich country goods' ". The latter using nonlinearity into a dynamic panel model of growth rather than the conventional cross-sectional country growth regressions, found a strong positive relationship between export diversification and per capita income.

Finally , Arip , Yee and Karim (2010) using cointegration analysis and Granger Causality tests also found a positive relationship in Malaysia where export diversification promotes economic growth.

A number of channels through which export diversification can influence economic growth have been exposed. The empirical literature largely points toward a positive relationship between export diversification and economic growth.

3.0 ECONOMETRIC MODEL

The econometric model is developed from an augmented Solow Growth Model. The latter assumes an exogenous production function and total factor productivity (TFP) and constant return to scale. According to the model, the higher the contribution of capital and labour, the

higher will be a county's growth in output. An export concentration index is added in the empirical model to investigate the relationship between export diversification and economic growth.

The Hirschman[6] export concentration index is used as a measure of export concentration and is calculated using the following formula:

$$Hj = \sqrt{\sum_{i=1}^{n} \left(\frac{x_i}{X}\right)^2}$$

where Hj is the Hirschman export concentration index for year j

Xi is exports of good i in year j and **X=** $\sum$**xi** that is the sum of all exports in year j

A concentration ration nearer to 0 means higher export diversification and one nearer to 1 means higher export concentration

In line with the analytical framework, a general growth equation of the following form is used:

$$\mathbf{Y_t = \alpha + \beta_1 HC_t + \beta_2 Inv_t + \beta_3 LabProd_t + U_t}$$

where **Yt** denotes log per capita income or per capita GDP , $\mathbf{HC_t}$ is the Hirschman export concentration index, $\mathbf{Inv_t}$ is log investment or the gross domestic capital formation , $\mathbf{Labprod_t}$ is the labour productivity index and $\mathbf{U_t}$ is the residual error variable , all variables are at period t .

Per capita GDP will be used as a proxy for economic growth, and investment /gross domestic capital formation is used as proxy for capital. The labour productivity index is used as proxy for labour to get the contribution of labour to national output. The variable of interest is the export

[6] Also referred to the Herfindahl-Hirschman index in the literature

diversification index which is calculated using the Hirschman index based on the 4-digit Standard International Trade Classification (SITC), revision 2 from the U.N. COMTRADE (Commodity Trade Statistics Database) data set. This SITC classification is used mainly because of data availability and its use in similar studies (see for e.g. Lederman and Maloney 2007). Alternatively, this index could have been calculated from the Feenstra et al (2005) data set as used by Hesse (2008), data is however limited till year 2000. Data on per capita GDP, gross domestic capital formation (proxy for capital/investment) and labour productivity index has been obtained from various reports of the Central Statistical Office of Mauritius. The concentration index is calculated using export data extracted from COMTRADE Database.

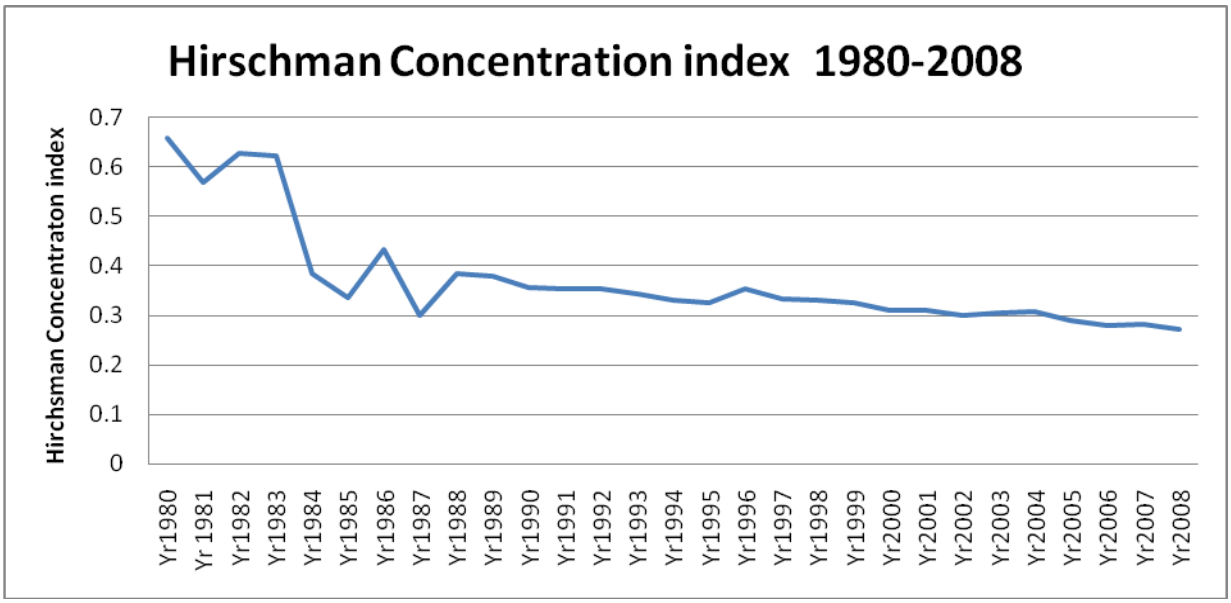
As per economic theory, a positive relationship is expected between investment, labour productivity and economic growth while a negative sign is expected for the Hirschman concentration index coefficient so that a higher export concentration (lesser export diversification) leads to lower economic growth and vice versa.

Time series analysis including Unit Root and Cointegration tests is used to assess the relationship between export diversification and economic growth.

4.0 RESULTS AND ANALYSIS

The export concentration index for Mauritius (Figure 1) has been experiencing a general declining trend for the period 1980-2008 moving from 0.66 in 1980 to 0.27 in 2008.

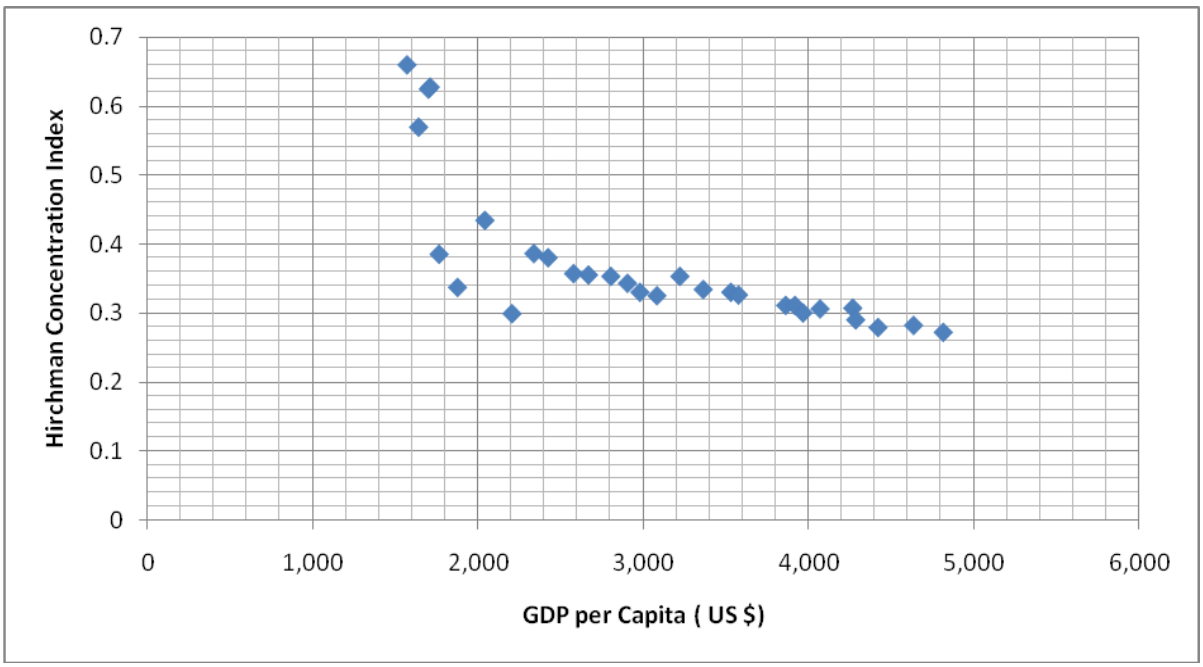
Figure 1: Hirschman Concentration index for Mauritius



There was a drastic fall in the index in 1984 reflecting the adoption of the export led growth strategy by the government and the incentives given by the later for attracting foreign direct investment in the Export Processing Zone. Apart from traditional export products like sugar and fish, the country started to produce and export apparels and garments boosted by the preference entry on the EU and US markets. The diversification trend continued with more high value added products introduced to face the stiff global competition from low cost and low wage clothing producing countries. Production of fashion clothing and jewellery, clothing accessories as well as light engineering and high tech products were encouraged. With the promulgation of the Africa and Opportunity Act in the USA in 2002, a new impetus was given to the export of textile products including fabrics to regional African countries to meet the AGOA's rules of origin but also non -textile products including Tuna , processed food from the Sea Food Hub and others .

The relationship between the export concentration index and economic growth proxied by per capita GDP is shown in figure 2 as follows:

Figure 2. Scatter diagram of the Hirschman concentration index and GDP per Capita



The scatter diagram depicts an inverse relationship between the concentration index and per capita.

Variables used for the empirical analysis are log gross domestic product (LogGdp), the Hirschman concentration index (HC), log investment (logInv) and the labour productivity index (LabProd). Data and summary statistics on same are presented in Appendix A.

The Augmented Dicker Fuller (ADF) (see Dickey and Fuller, 1979) unit root test which is used to determine the integration order of each series as per table 1 reveals that all the series are I (1), that is stationary after first differencing. The ADF test control for possible correlation in the error terms by adding lagged values to the dependent variable (Gujarati 2003).

Table 1: Unit Root Test

ADF UNIT ROOT TEST		
Variable	ADF Value (constant included)	ADF value(constant and linear trend included)

		Level	First differenced	Level	First differenced
LogGDP		-2.978**	-4.440*	-1.231	-5.380*
HD		-2.905**	-6,771*	-3.267***	-6.831*
LogInv		-0.935	-5.276*	-1.234	-5.293*
LabProd		2.976	-3.901*	-2.001	-5.591*
Critical Values	1%	-3.730	-3.736	-4.352	-4.362
	5%	-2.992	-2.994	-3.588	-3.592
	10%	-2.626	-2.628	-3.233	-3.235

Notes: *, ** and *** indicates significance at the 1%, 5% and 10% levels respectively

Even if individual variables are not stationary that is I (0), the group of variables may drift together so that a long term or a cointegrating relationship exists among them. This implies that a linear combination of two or more such variables can be stationary. However the variables must be integrated of the same order and greater than zero.

The Johansen cointegration procedure is used to test for the existence of such a long term relationship. The latter is preferred to the Engle and Granger two step procedure which conceals information on the coefficients of the explanatory variables in the cointegrating vector (Olayiwola & Johansein 2010). Table 2 reports the results of the Johansen cointegration test. The optimal lag lengths are determined using the AIC, HQIC and SBIC information criteria.

Table 2: Johansen Cointegration Test

Cointergrated Rank Test (Trace)				
H0	H1	Trace Statistics	5% Critical Value	Hypothesized No of CE(s)
r=0	r=1	72.7837*	47.21	None
r≤1	r=2	32.7561*	29.68	At most 1
r≤2	r=3	13.8371	15.51	At most 2

r≤3	r=4	0.2464	3.76	At most 3
Cointergrated Rank Test (Max Eigenvalue)				
H0	H1	Max Statistics	5% Critical Value	Hypothesized no of CE(s)
r=0	r=1	40.2276*	27.07	None
r≤1	r=2	18.4190	20.97	At most 1
r≤2	r=3	13.5906	14.07	At most 2
r≤3	r=4	0.2464	3.76	At most 3

Normalized cointegration coefficients (Standard error and p value in parentheses)

LogGdp	HC	LogInv	LabProd	Constant
1.00000	0.6794843	-0.4743632	-0.0048592	-2.457529
	(0.840003) (0.00)	(0.3435211) (0.00)	(0.0005785) (0.00)	

Note * indicate significance at the 5% level

From table 2 , the trace test indicates two cointegrating equations while the max eigenvalue test indicates one cointegrating equation. The first row tests the hypothesis of no cointegration, the second row tests the hypothesis of one cointegrating equation and the process is repeated for the remaining rows. The results show the presence of at least one cointegrating vector among the four variables. Thus, these variables are tied together in the long run and their deviations from the long run equilibrium path will be corrected.

The normalized cointegrating equation reveals that in the long run , export concentration negatively affect economic growth in Mauritius thereby rejecting the null hypothesis that export diversification does not significantly impact economic growth .This result meet a-priori expectations as reported in the literature review. The positive coefficient for logInv and LabProd also meet a-priori expectations as an increase in investment and labour productivity is expected

to result in higher national output. The existence of a cointegrating relationship allows for the derivation of a Vector error correction model (VCM).

The basic idea is that though a long term equilibrium relationship may exist among two or more cointegrated series, there may still be disequilibrium. The error correction mechanism serves as a means of reconciling such short–run behavior of an economic variable with its long-run behavior. The Vector Error Correction Model is given in table 3 below:

Table 3 .Vector Error Correction Model, Standard Errors in ( ) and P values in [ ]

Variable	D_LogGdp	D_HC	D_logInv	D_LabProd
E_1	-0.2975699	-0.3830365	-0.1430836	17.31456
	(0.532356)	(0.248434)	(0.2239332)	(6.603625)
	[0.00]	[0.124]	[0.523]	[0.009]

The model has expected sign and was tested for autocorrelation, heteroscedastcity and normality[7]. The VECM stability test as reported in Appendix C shows that all the eigenvalues lies inside the unit circle so that the model satisfies the stability condition**.** The error correction term for changes in the export concentration index meet a-priori expectation and is significant revealing that 38% of the short run disequilibrium adjusts to the long run equilibrium each year. The speed of convergence is quite high.

The variance decomposition gives information about the relative importance of changes in the value of each variable in the VAR .It also provides the proportion of "the movements in the dependent variables that are due their 'own' shock, versus shock to other variables" (Olayiwola

[7] The Lagrange Multiplier (LM) test for serial autocorrelation accepts the null hypothesis of no autocorrelation at lag order and the Jarque-Bera test for normally distributed disturbances has a p-value of 0.05 indicating normality.

and Okudua, 2009). A ten year forecasting horizon is employed; the variance decomposition is reported in table 4.

Table 4: Variance Decomposition

Period	LogGdp	HC	LogInv	Labprod
1	100.000	0.0000	0.0000	0.0000
4	51.9659	30.6099	16.4184	1.3528
7	44.4466	35.0003	18.9886	1.5944
10	42.0080	36.5366	19.8221	1.6332

Cholesky Ordering: logGdp, HC, LogInv, LabProd

As documented in table 4 , a one standard deviation shock to GDP in forecast year 4 accounts for 51.9% of the variation in GDP compared to 42.0% variation in forecast 2010 .Furthermore , a one standard deviation shock to export concentration in forecast year 4 accounts for 30.6% variation in GDP and 36.5% in forecast year 10 . For investment and labour, the variation in GDP to one standard shock is 16.4% and 1.4% in forecast year 4 and 19.8% and 1.6% for forecast year 10. The impact of export concentration on GDP appears to be increasing from period 4 to 10.

5.0 POLICY RECOMMENDATIONS

Using Johansen cointegration analysis , the econometric investigation revealed that export diversification positively affect economic growth in the long run in Mauritius while the short run dynamics is underlined by the Vector Error Correction Model(VECM) . Balaguer and Cantavella-Jorda (2004) and Arip, Yee and Karim (2010) found a similar relationship using cointegration and causality tests. Hesse (2009), Agosin (2007), Guitierrez de Pineres and De

Ferranti et al (2002), Ferrantino (2000) and Al Mahurbi (2000) amongst others also found a positive relationship between export diversification and economic growth[8].

While the channels through which export diversification leads to higher economic growth have not been specifically investigated , two main channels through which diversified export growth stimulates output growth can be speculated .One of them is the portfolio effect where diversification of exports lead to less export volatility , which in turn results in lowered output volatility .Countries with highly unstable economies grow more slowly than countries that exhibit stable cycles. (Agosin 2007).The data do not contradict this chain of reasoning .

The second channel is linked to the benefits associated with successful efforts to diversify, paramount to which are learning and information externalities. Any new export produces information that is useful to other potential entrants into the industry. This is in line with the entrepreneurial cost discovery process as advocated by Hausmann and Rodrik (2003) and discoveries about demand as advocated by Vettas (2000) as reviewed in the literature review. According to Hausmann and Rodrik (2003) , entrepreneurs face significant cost uncertainties in the production and export of new goods and that success in developing new exports will have spillover effects (information spillovers) while failure end up being private leading to suboptimal level of investment and innovation. In addition, the more diversified an economy is, the higher the likelihood that there will be profitable investment opportunities. On the same line of reasoning, Vettas (2000) point out that discoveries about foreign demand would lead to imitation and therefore increased local production for exports and higher growth. Government should therefore intervene by creating the right incentives for investment. (Hausmann and Rodrik, 2003)

[8] Refer to the Literature Review

The policy implication from the findings of this study suggest that , in order to sustain future economic growth , Mauritius should diversify its exports and greater emphasis on export diversification should be given in the country's trade and industrial policies.

To ensure that domestic resources are channeled to their most productive uses, a modern incentive framework need to be elaborated (Brenton et al, 2007). The interaction between trade policies, tax, investment promotion and labor market policies have to be examined so that the right business environment and the right incentives are created to encourage existing and potential investors to increase the export diversity. The exchange rate policy is another important element in the incentive framework so that maintaining a competitive real exchange rate is imperative for export growth.

Government intervention in terms of subsidies for experimenting new products and markets as well as in investment in upstream innovation is needed to curb the lack of discovery efforts from first movers. Improving access to information about technologies and markets will encourage both first movers and imitators. Grant matching schemes for international marketing and participation in international trade fair as well as setting up of a technology diffusion scheme, and a national innovation system can also help to mitigate market and information failures.

The above measures are doomed to fail if complementary measures to reduce the cost of doing business in Mauritius are not adopted. Higher costs for energy, telecommunications, transport and logistics, finance and security will undermine the cost competiveness of domestic firms and exporter's .Improving the competitive and regulatory business environment is crucial and as suggested by Brenton et al (2007), the creation of an intra-ministerial council on competitiveness may help in such an endeavor.

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APPENDIX A

Data Used 1980-2008

Year	LabProd	LogGdp	LogInv	HC
1980	57.1	3.939369	3.307068	0.659
1981	57.8	4.008983	3.350248	0.569
1982	58.5	4.069113	3.322219	0.627
1983	59.1	4.105953	3.361728	0.624
1984	60	4.157155	3.414137	0.385
1985	60.4	4.220579	3.491362	0.337
1986	60.9	4.294466	3.58995	0.434
1987	62.1	4.37247	3.706718	0.299
1988	63.7	4.444092	3.902547	0.386
1989	63.9	4.508732	3.932727	0.38
1990	66.7	4.579669	4.074268	0.357
1991	68.2	4.621903	4.104556	0.355
1992	71.5	4.666733	4.141387	0.353
1993	73.6	4.720416	4.206853	0.343
1994	75.7	4.75602	4.287802	0.33
1995	79.1	4.840589	4.217458	0.325
1996	83.4	4.840614	4.294664	0.353
1997	86.9	4.883548	4.356676	0.334
1998	90.6	4.932727	4.359266	0.33
1999	91.76	4.961136	4.469189	0.326
2000	100	5.002887	4.44083	0.311
2001	103.7	5.043103	4.475395	0.311
2002	105.3	5.072018	4.492411	0.3
2003	108.6	5.107217	4.550889	0.306
2004	112.7	5.152349	4.579818	0.307
2005	114.6	5.172769	4.59913	0.29
2006	118.5	5.216612	4.699387	0.279
2007	123.1	5.271419	4.772101	0.282
2008	124.7	5.320412	4.814088	0.272

Hirschman Concentration Index for Mauritius for the period 1980-2008

Year	Hirschman index	Year	Hirschman index	Year	Hirschman index
1980	**0.659**	1990	**0.357**	2000	**0.311**
1981	**0.569**	1991	**0.355**	2001	**0.311**
1982	**0.627**	1992	**0.353**	2002	**0.300**
1983	**0.624**	1993	**0.343**	2003	**0.306**
1984	**0.3.85**	1994	**0.330**	2004	**0.307**
1985	**0.337**	1995	**0.325**	2005	**0.290**
1986	**0.434**	1996	**0.353**	2006	**0.279**
1987	**0.299**	1997	**0.334**	2007	**0.282**
1988	**0.386**	1998	**0.330**	2008	**0.272**
1989	**0.380**	1999	**0.326**		

Source: Authors calculation based on export data extracted from UN COMTRADE using WITS

Summary Statistics

	LogGDP	HC	LogInv	LabProd
Mean	4.699416	0.371172	4.224306	82.83310
Median	4.756020	0.334000	4.217418	75.70000
Maximum	5.320412	0.659000	4.814088	124.7000
Minimum	3.939369	0.272000	3.307068	57.10000
Std Dev	0.416029	0.107996	0.479671	22.72540
Skewness	-0.317028	1.718894	-0.447710	0.494411
Kurtosis	1.882495	4.673909	1.910090	1.97256
Jarque-Bera	1.996611	17.66626	2.404220	2.929438
Probability	0.368503	0.000146	0.300562	0.231143

Source: Authors computation

All variables seem to follow a normal distribution at the 5% and 1% significance level as shown by the Jarque-Bera test. The higher the Jarque-Bera statistics, the higher the log likelihood, hence variables are normally distributed. The dependent variable is GDP per capita with a mean of 4.7 and a standard deviation of 0.4.The concentration index has a mean of 0.37 over the period with a standard deviation of 0.1 while Investment has a mean of 4.2 and a standard deviation of 0.4. The productivity index has been averaging 82.3 over the period with a standard deviation of 22.7.

APPENDIX C

VECM Stability Condition.