ANNUAL FORUM 2005

Trade and Uneven Development: Oppo rtunities and Challenges

CO-MOVEMENT BETWEEN SOUTH AFRICA AND SADC: IS TRADE A PREDOMINANT FACTOR?

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November, 2005

Abstract

This paper uses a novel dynamic factor model *à la* Forni *et al.* (2003) to investigate the impact of increasing trade on the co-movement of the business cycle between South Africa and the Southern African Development Community (SADC) countries. The results show a moderate but increasing synchronization between South Africa and SADC countries, in contrast with the already existing high correlation between the South African business cycle with the G-7 countries and most emerging market countries. This is evidence of the increasing importance and spread of the forces of globalization, reflected in the increasing integration of goods and services through international trade. The striking result is that South Africa, justified by its geographical location and increased trade integration in the SADC, cannot isolate itself from its SADC neighbours, and that regional policy coordination is of the utmost importance.

Keywords: International business cycles, generalized dynamic factor model, co-movement, intra-regional integration

JEL subject classifications: C13, C32, E30, F02, F41

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1   Introduction

The process of globalization had a large impact on the world economy over the past three decades. For developing countries, the forces of globalization became more pronounced from the late 1980s and early 1990s (see Loots, 2002). The forces of economic globalization are particularly evident in the breaking down of national economic boundaries, the liberalization of international trade, finance and production activities and the growing power of transnational corporations and international financial institutions (Khor, 2000:3). Economic globalization therefore manifests itself in the increasing integration of goods and services through international trade and the integration of financial markets.

While the international flows of goods, services and capital are significant, the existence of co-movements in economic variables for different countries became more evident. The extent to which globalization causes domestic economies to move with economies in the rest of the world or in their particular region, concerns policy-makers. When such co-movement is comprehensive, the influence of policy-makers on their respective domestic economies is significantly reduced.

South Africa is no exception to the rule. The country re-entered the international economy in the early 1990s when the forces of globalization, especially for developing countries, seemed to gain momentum. Evidence shows that approximately 98 per cent of the current growth performance in the country can be explained by the forces of globalization (Loots, 2003:239). This is further strengthened by the strong evidence in this study on the international co-movement between the world common component and the South African cycle. If we use the aggregate G7 cycle as proxy for the world business cycle, a strong relationship exists between the South African and G7 components. The co-movement improves from the early 1990s, corresponding to South Africa's integration into the global economy after a long period of isolation. The G7 common component explains approximately 66 per cent of the variation in the South African economic growth rate.

South Africa was admitted as a member of the Southern African Development Community (SADC) in 1994. Of the 14 member states, South Africa has by far the largest and most developed economy in the region. The question that arises is the extent of the co-movement between the South African economy and the remaining 13 SADC economies. Although various studies[2] have focused on debates such as whether conversion or diversion is taking place within the SADC region, as well as the contagion effect of for instance the Zimbabwe crisis, an analysis on the synchronization or co-movement between South Africa and the remaining SADC countries as well as the common component that drives the growth process in the region has not to date been attempted. An exception is a recent article by Arora and Vamvakidis (2005), which indicate that South African growth has a significant positive impact on growth in other Sub-Saharan African countries. However, the focus of this study was broader and the methodology differs.

This article investigates whether synchronization of real GDP growth in a cross-section of SADC countries can be explained by a regional common factor. It is important to address these issues for two reasons. First, a better understanding of how business cycles in SADC are co-moving can explain the extent to which economic crisis or benefits have the ability to spread across the region. Secondly, the extent of the co-movement of business cycles in South Africa and SADC economies could have important implications for future regional policy coordination. Models to be used in the analysis are based on a novel dynamic factor model, as developed by Forni *et al.* (2003) and concordance index by Harding and Pagan (2002)

The article is structured as follows: the first part of the article will provide an overview of the economic dynamics of South Africa and the rest of the SADC member countries. This will be followed by a literature overview on the most prominent contributions of dynamic factor modeling as well as the methodology applied to this particular analysis. The fourth part shows the empirical results, and is followed by an explanation of the factors

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[2] See Jenkins & Thomas (1998) and Pretorius & De Beer (2004).

underlying the co-movement. The article concludes with possible policy implications for South Africa and the rest of SADC.

This article is an important contribution to the existing literature on the co-movement of economic variables between countries by the application of a novel factor dynamic model. While previous studies focused predominantly on developed countries only or on a combination of developed and developing countries in their analysis, the application of a dynamic factor model to analyze the co-movement between SADC countries in particular is unique.

2   A general comparative analysis of South Africa and SADC economies

The globalization of the world economy has added new impetus to regional integration. More and more countries around the world are collaborating within various forms of regional groupings in order to expand markets. SADC is no exception to the rule. The Declaration, Treaty and Protocol establishing SADC were signed by the Heads of State of the then 10 member countries in 1992. The aim was to promote cooperation between countries in the region by enabling them to address problems of national development and to cope more effectively with the challenges posed by a changing and increasingly complex regional and global environment (Delport, 1999:54). Since 1992 the SADC member countries have expanded to 14. The current members include South Africa, Angola, Botswana, the Democratic Republic of the Congo (DRC), Lesotho, Malawi, Mauritius, Mozambique, Namibia, Madagascar, Swaziland, Tanzania, Zambia and Zimbabwe.

South Africa is by far the strongest and most dominant country within SADC.[3] In 2002 the GDP (at constant 1995 market prices) for SADC was US$ 239.7 billion, of which US$ 182.2 billion or 76 percent was generated in South Africa. However, the market

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[3] The data for this part is from the World Bank's 2004 version of the African Development Indicators.

share is unequally distributed among the populations of the member countries. Of the total SADC population of 205.5 million people, only 22 percent are from South Africa.

This economic dominance is further strengthened if the exports of SADC are taken into account. Approximately 64 percent of the total exports in SADC in the period 1993-2002 were from South Africa. The South African economy and those of Mauritius and Tanzania are also seen as having more diversified economic structures. This is in contrast with the lack of diversification in exports in other member countries. If the top three export commodities as percentage of merchandise exports are taken into account, a high dependence is evident in countries such as Angola (98 percent), DRC (82 percent), Malawi (78 percent), Namibia (78 percent) and Botswana (71 percent). The average dependence for SADC is 40 percent, in comparison with the 23 percent dependence of South Africa.

On the investment level the dominance of South Africa is even more pronounced. Approximately 71 percent of the average gross domestic investment over the past decade in SADC has taken place in South Africa. However, the investment-to-GDP ratio for ten SADC economies in 2002 outstripped the level in South Africa. The Economic Commission for Africa (2003:34) in its 2003 Economic Report on Africa emphasized that an investment-to-GDP ratio of 25 percent or more is needed to accelerate growth in Africa. If this 25 percent prerequisite is taken into account, the investment-to-GDP ratio in 2002 accelerated in countries such as Mozambique (41 percent), Lesotho (40 percent), and Angola (32 percent). If this investment trend persists, it could lead to future sustainable growth in the region.

On the socio-economic front, wide disparities are also evident. The average GDP per capita (in US$) for the period 1993-2002 in South Africa ($3 902), Mauritius ($3 817) and Botswana ($3 535) also outstripped the average for the SADC, estimated to be $1 134 (World Bank, 2004). This is in contrast with average per capita levels of between $112 to $603 in countries such as the DRC, Malawi, Mozambique, Tanzania, Zambia, Angola and Lesotho. The illiterate population as share of the population of 15 years and

older for SADC is 26 percent. This is in contrast with a low rate of illiteracy in Zimbabwe of 10 percent and in South Africa of 14 percent. The average life expectancy in the region is 46.5 years. This low life expectancy is due to the high HIV/Aids prevalence in South Africa and other Southern African countries. The only SADC member country that is an exception is Mauritius, with a life expectancy of 72.5 years.

Regional economic integration tends to be more successful when member countries are more or less on the same level of development. This is not the case in the SADC, where wide disparities are still evident and South Africa still remains the most developed economy in the region. The question that arises is to what extent the South African economic leadership drives the co-movement in the region.

3   Literature review

The most prominent study using a novel dynamic factor model is by Yang (2003). He applied a novel factor dynamic model to analyze the dynamics of co-movement of the real GDP, consumption and investment behaviour for a cross-section of 103 developed and developing countries. He concluded that world common shocks explain a substantial amount of international economic fluctuations. He also analyzed the effects of international common factors at different business cycle frequencies as well as the sensitivities of countries to these shocks. As regards the real GDP and consumption, he concludes that developed countries are less susceptible and sensitive to world common shocks. The sensitivity of investment to world common shocks depends on the particular country size, level of openness and its remoteness.

The study by Nyembwe and Kholodilin (2003) focused on the asymmetric relationship between the European Monetary Union and sub-Saharan African countries by testing whether evidence on business cycle convergence exists. By applying a linear dynamic factor model (also known as the Stock and Watson approach), they constructed a composite economic indicator to capture economic fluctuations in the European Monetary Union. The authors concluded that no evidence on the obvious transmission of

European economic fluctuations to sub-Saharan Africa exists despite the fact that the EU is the main trading partner of the majority of African countries.

Brooks *et al.* (2003) summarized some important stylized facts on co-movement, based on the outcomes of a conference where research focused on the strength, nature and sources of co-movement in financial markets. The stylized facts are as follows: firstly, financial co-movements tend to be substantially larger than co-movements in the real economy. Secondly, financial co-movement has increased for financial markets in developed as well as in emerging market economies. Lastly, no clear evidence exists on the co-movement in the real economy. Brooks *et al.* (2003:4) concluded that, in contrast with clear and relatively consistent evidence on financial co-movement, evidence on real co-movement is "blurred and controversial".

Forni *et al.* (2001) proposed a novel method, called generalized dynamic factor modeling, to analyze the possible co-movements of a large panel of macroeconomic variables in the European Monetary Union. Since economic activity in market economies is characterized by cyclical behaviour and co-movements in macroeconomic variables, Forni *et al.* (2001) constructed a coincident index for the European Union. Unlike vector autoregressive models or vector autoregressive moving average models, their model can accommodate a large number of cross-sectional units than the number of observations. They defined the constructed index as the *common component* of European real GDP.

Nadal-De Simone (2002) used a concordance index proposed by Harding and Pagan (2002) and a dynamic factor model to analyze synchronization of output cycles between EU countries and the United States. Results support the evidence of global component as well as a regional component that explains co-movement between European economies themselves and with the US. The author found that idiosyncratic components matter for France.

Heitz *et al.* (2004) studied synchronization of business cycles between G7 countries. Their focus is on the role played by trade of goods and services, and financial market

liberalization in fostering co-movement between G7 economies. Their empirical results – based on factor model analysis – did not support the hypothesis of increasing synchronization of business cycles for the last decade; the main reason being a decrease in common shocks followed by an increasing importance of idiosyncratic shocks for most of these countries.

4 Methodology

4.1 Concordance index

A study of co movement between economic variables within and across countries has been gaining popularity recently. Harding and Pagan (2002) developed an index – *concordance index* - to measure the degree of synchronization between specific cycles. The index quantifies the number of time two cycles spend in the same state of expansion or contraction. Mathematically, the index is written as

$$I_j = \frac{1}{T} \sum_{t=1}^{T} [\, S_{it} S_{jt} + (1 - S_{it})(1 - S_{jt})\,] \tag{1}$$

where i and j are two time series, T is the sample size; and S_t is a binary variable that takes the value of 1 when the economy in expansionary phase while a contraction phase is indicated by $S_t = 0$.

The index can be used to assess whether two series are pro or counter-cyclical. The value of 1 indicates that the series are pro-cyclical, whereas 0 designates a counter-cyclical series. The index is also proportional to the regression estimates of a linear regression - with an intercept - of the state variable S_{it} on S_{it}. Moreover, the regression results can be used to assess the statistical significance of correlation coefficients. Hence, a significant coefficient implies a rejecting of null hypothesis of no synchronization.

4.2   Generalized Dynamic Factor Model (GDFM)

In the GDFM, each time series is assumed to be composed of two unobserved components: the common components, which are driven by a small number of shocks that are common to the entire panel, and the idiosyncratic components, which are specific to a particular variable and orthogonal with the common components. The notion behind the common component analysis is that only a small number of random variables determine the co-movement of business cycle. Since the second part plays a negligible role in the estimation of the business cycle, it is appropriate to eliminate it and focus fully on the first part.

Consider:

$$x_{nt} = B_n(L)f_t + \xi_{nt} \tag{2}$$

where $f_t = (f_{1t} \ldots f_{nt})'$ is a vector of common factors, $B_n(L)$ is a polynomial of order s in the lag operator L. Equation (2) can also be written as:

$$x_{nt} = \chi_{nt} + \xi_{nt} \tag{3}$$

where $\chi_{nt} = (\chi_{1t} \ldots \chi_{nt})'$ is a vector of common components. The ith common component is a function f_t such as:

$$\chi_{it} = b_{i1}(L)f_{1t} + b_{i2}(L)f_{2t} + \ldots + b_{iq}(L)f_{qt} \tag{4}$$

In a dynamic factor model analysis the following assumptions are required for the identification of common components and the consistency of their estimates.

Let $\lambda_{xq}, \lambda_{\chi q}$, and $\lambda_{\xi q}$ be dynamic eigenvalues of x_{nt}, χ_{nt}, and ξ_{nt}, respectively, and V_n be the eigenvector of λ_{xq}.

i) The factors f_t are mutually orthogonal stationary processes at any lead and lag.

ii) The idiosyncratic components ξ_{nt} are correlated both in the time dimension and in the cross-section dimension.

iii) $\lambda_{xq}(\theta) \to \infty$, as $n \to \infty$, for any frequency $\theta \in [-\pi, \pi]$

iv) $\lambda_{\chi j}(\theta) > \lambda_{\chi j+1}(\theta)$, for any $\theta \in [-\pi, \pi]$; where $j = 1, ..., q$.

v) There exists κ, such that $\lambda_{\xi_n}(\theta) \leq \kappa$, for any $\theta \in [-\pi, \pi]$.

The model (3) differs from Stock and Watson (1989) in that the latter consider a fixed number of time series, while in equation 3 n goes to infinity. It is similar to the dynamic factor model of Sargent and Sims (1977) and Geweke (1977), except that in this model there is a possibility of autocorrelation between idiosyncratic components. Applying the law of a large number in equation 3, the idiosyncratic component – which is poorly correlated – vanishes. Hence, we are basically left with the common components only. Furthermore, the assumption of orthogonal idiosyncratic components made by Stock and Watson (1989) is highly unrealistic.

There is no formal statistical approach to determine the number of factors in a Generalized Dynamic Factor Model. Bai and Ng (2002) proposed some information criteria for the selection of number of factors in large dimensional panels. We prefer using one common factor as a proxy of regional or world factor. Heitz *et.al* (2004) and Nadal-De Simone (2002) also used a single factor model in the analysis of synchronization among developed countries.

Another equally important issue in dynamic factor modeling is the determination of the value of truncation point M. Forni *et al*. (2001) suggest that $M = round\left(\sqrt{T} \big/ 4 \right)$ performs well for a low order the moving average and autoregressive models. However, Kabundi

(2004) and Yang (2003) find that in most cases this rule gives values that are not sufficient to describe the dynamics of economic variables.

5   Data transformation and empirical results

5.1.   Data and data transformation

The data for SADC countries are annual real GDP data obtained from the Global and African Development Indicators series, respectively, of the World Bank. We have used the real growth rate to analyze the co-movement between the South African business cycle and SADC covering the period 1980–2002. It is more informative to study macroeconomic variables with high frequency data. However, this task is almost impossible with African countries as most African data is either inaccessible or only available on an annual basis. Of the 14 SADC members, we studied the co-movement of the business cycles of 12 countries (see Table 4). Tanzania and Madagascar were not included because of data restrictions. For the analysis of percentage share of South African trade with the rest of SADC countries, we used annual data obtained from South African Trade Map (Quantec). Similarly, to extract the world common component we use the annual real GDP growth rate for South Africa alongside G7 countries.

To study the co-movement of South Africa with the rest of the world, we used quarterly data on the growth rate of real GDP of the G-7 and nine emerging market countries (see Table 2), covering the period 1995:1–2004:1. This data was obtained from International Financial Statistics.

In transforming the data various methods were applied. In the analysis of the co-movement of business cycles, we normalized all variables by subtracting the mean from each series and dividing them by the standard deviation. We performed unit root test to examine stationarity of each real GDP growth rate. The popular Augmented Dickey-Fuller test, for stationarity, has been criticized because of its low power. In this paper we use the generalized least-squares Dickey-Fuller test proposed by Elliott *et al.* (1996). The

optimal length is obtained using the modified Akaike information criterion, and all variables are stationary at the 10 per cent level (see Table 1).

Table 1: DF-GLS Test for Unit Roots

SADC Countries	DF-GLS	G7 Countries	DF-GLS
SA	-4.11**	Canada	-4.21**
Angola	-2.87**	France	-2.80**
Botswana	-1.77*	Germany	-3.16**
DRC	-1.93*	Italy	-2.71**
Lesotho	-3.87**	Japan	-1.70*
Malawi	-6.11**	UK	-2.45**
Mauritius	-2.54**	USA	-3.43**
Mozambique	-2.83**	G7	-2.90**
Namibia	-3.70**		
SADC	-3.03**		
Swaziland	-5.81**		
Zambia	-4.44**		
Zimbabwe	-3.16**		

**Denote variable are stationary at 5 percent and * stand for stationarity at 10 per cent. The 5 percent critical value is -1.96 and -1.61 is the 10 per cent critical value

5.2   Empirical results

5.2.1   Concordance

Concordance indices, correlation coefficients and their correlation t-statistics are shown in Table 2. Countries with high concordance indices display relative high correlation coefficients. These results reveal that the South African cycle is synchronized with the aggregate cycle for the rest of the SADC countries as well as with those of Swaziland, Lesotho, and Zimbabwe. Besides the fact that these countries are major trading partners of SA within the region, they are also its nearest neighbours. The concordance indices also shows that South Africa and countries like Swaziland, Lesotho, Zimbabwe, Zambia, Angola, Malawi, the DRC and Botswana follow a pro-cyclical pattern, in contrast with the counter-cyclical pattern with Mauritius. The latter economy is becoming more diversified and weak trade ties exist with South Africa. The fact that an indifferent cycle exists between South Africa and two of its closest neighbours namely Mozambique and

Namibia is somewhat confusing. However, only the aggregate for SADC and Swaziland have a significant degree of synchronization with the South African cycle, with none of the other countries showing a statistically significant degree of synchronization.

Table 2: Concordance, Correlation and t-Statistics index

Countries	Concordance	Correlation	t-Statistics
SADC	0.77	0.55	2.93
Swaziland	0.73	0.45	2.25
Lesotho	0.64	0.28	1.32
Zimbabwe	0.64	0.26	1.20
Zambia	0.59	0.20	0.92
Angola	0.59	0.17	0.77
Malawi	0.55	0.10	0.45
DRC	0.55	0.07	0.31
Botswana	0.55	0.10	0.45
Mozambique	0.50	-0.02	-0.08
Namibia	0.50	-0.02	-0.08
Mauritius	0.36	-0.27	-1.24

5.2.2 Generalized Dynamic Factor Model: Co-movement between South Africa and SADC

In this section we use the generalized dynamic factor analysis to extract common components of the South African and SADC GDP growth rates. The model is constructed as stated in section 4.2. We first determine the lag length, in this instance we choose one lag ($s = 1$) since SADC growth rates are based on annual data. Furthermore, we choose a single factor model which represents a regional factor underlying synchronization of business cycles.

Figure 1 shows the synchronization of the South African regional component with the aggregate SADC common component. These series follow a similar pattern with the South African component under-performing the SADC component, with the exception of 1993. The SADC component experienced a considerable contraction in 1993 following an oil price shock of 1991 and a global slow down of 1993. Appendix AI shows the

graphical representation of the SA common component with individual SADC members' component. In almost all countries a similar pattern of co-movement is evident.

Figure 1: Common component of South Africa and SADC
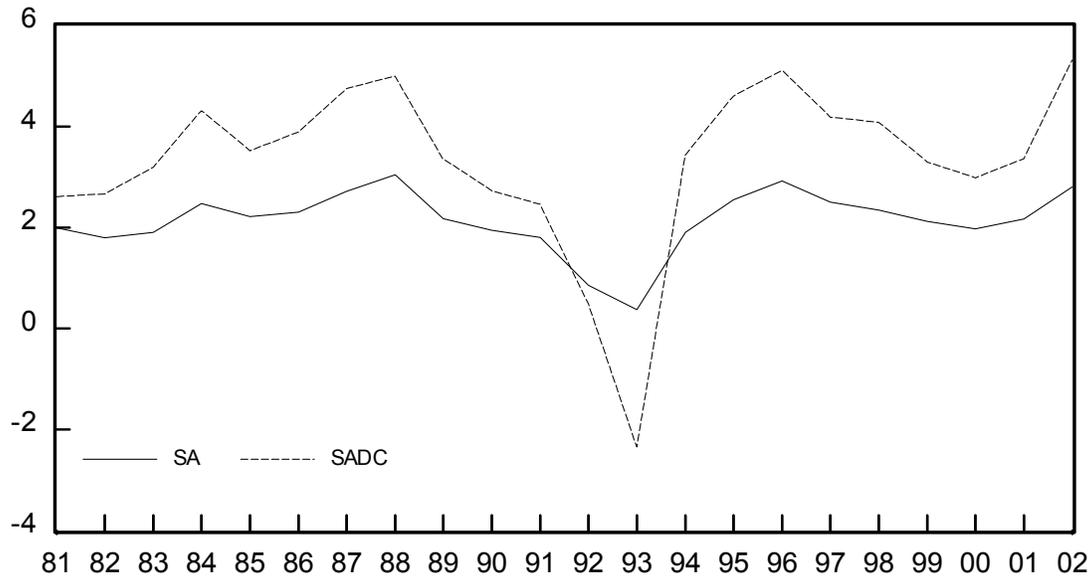
Table 3 depicts the correlation coefficients of the South African SADC countries' common components and idiosyncratic components, respectively. The results of the common component indicate that South Africa is more synchronized with Swaziland, Botswana, the aggregate for SADC, Zimbabwe, DRC, Lesotho, and Angola. This finding supports the concordance index results. All SACU[4] member countries, except Namibia, show signs of co-movement with South Africa. Of these top countries only the DRC and Angola didn't make the concordance index list. The relationship with the DRC and Angola is justified by the fact that their economies are predominantly natural resource driven. Both have relative weak trade ties with the South African economy.

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[4] The SACU – South African Customs Union – comprises South Africa, Botswana, Lesotho, Namibia and Swaziland.

However, these synchronization figures are illusive in that only 39 per cent of variation in the South African cycle is explained by the common component. It means although there seems to be a co-movement of GDP growth within the region, the regional factor plays a negligible role in influencing economic activity in South Africa. This implies that, for example, instability in Zimbabwe and the DRC does not have a significant impact on South Africa over the long term.

Table 3: Correlation between SA and SADC common and idiosyncratic components

Countries	Common component	Idiosyncratic component
Swaziland	0.99	0.03
Botswana	0.99	-0.15
SADC	0.97	0.52
Zimbabwe	0.96	0.06
DRC	0.93	0.13
Lesotho	0.93	0.26
Angola	0.91	-0.27
Mozambique	0.83	0.40
Mauritius	0.70	-0.21
Namibia	0.59	0.04
Malawi	0.10	-0.22
Zambia	-0.26	0.33

In contrast with the more general common component, the idiosyncratic component is indicative of whether a specific factor such as fiscal or monetary policy in South Africa influences economic activity in the SADC region. Table 3 indicates that the South African idiosyncratic component is mostly related to idiosyncratic components of the aggregate for SADC as well as to those of Mozambique, Zambia, Lesotho, and Angola. But correlation does not necessarily mean causation. Results obtained from regressing each of these countries' GDP growth rate on the South African idiosyncratic component, shows that only 10 per cent, 18 per cent, 12 per cent and 8 per cent, respectively, of the variation of SADC, Mozambique, Zambia, Lesotho are explained by the South African idiosyncratic component. It is clear that in general South Africa does not yet have a considerable economic influence in the region.

6   Factor of co-movement: Intra-regional trade

The above analysis highlights the fact that, in total, co-movement exists between SA and the remaining SADC countries. However, when studying individual evidence of co-movement, the results are blurred and controversial. It is crucial to find possible factors underlining business cycle co-movement within the region.

Sources or factors of co-movement in developing countries remain an open topic of research. Imbs (1999) and Brooks *et al.* (2003) identified several determinants of synchronizations of business cycles across nations, such as trade, the world business cycle, geographical proximity, membership to international trade agreement and financial market integration. As a result of the lack of sophistication and general development of the broader SADC financial markets, financial market synchronization is currently not a significant force in co-movement.[5] For the purpose of this article we therefore identify intra-regional trade as possible source of synchronization of business cycles within the SADC region.

SA has increased its role as the region's largest trading partner recently with the change of policy since 1994. The SADC has increased in importance as a destination for South African exports. SA exports to the SADC represented on average 3.3 per cent of total exports during the period 1997-1999, while in 2000-2002 this increased to 13.8 per cent. This rise is a result of recent shift in SA exports from developed countries to developing countries. Similarly, for the same period, SA imports from the SADC increased from 0.7 per cent to 6.5 per cent.

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[5] The absence of a fully functioning financial market is delaying the process of regional integration. In this regard, South Africa can play a leadership role within the region by integrating the financial market by providing its service. There is, indeed, a necessity for a systematic monitoring of harmonization of financial activities within the region to avoid potential malpractice that would be conducive to financial crisis.

Table 4: Imports from South Africa, as % of total imports, 1997-2002*

	Angola	DRC	Malawi	Mauritius	Mozambique	Zimbabwe	Tanzania	Zambia
1997	8.16	22.74	53.93	10.97	53.20	50.75	8.67	60.86
1998	9.92	23.56	50.66	10.28	50.99	50.20	10.44	58.38
1999	9.83	28.38	56.28	11.51	55.07	53.97	13.98	64.71
2000	10.42	24.67	52.32	16.75	58.08	52.17	16.22	63.28
2001	9.91	25.22	60.36	14.88	61.42	56.63	15.46	65.65
2002	12.16	23.07	40.41	16.49	42.03	63.62	14.03	49.62

Source: World Trade Tables, Quantec
*No imports data available for the SACU member countries. These figures are included in the SA figures.

Table 5: Exports from SADC countries to South Africa, as % of total exports, 1997-2002

	Angola	DRC	Malawi	Mauritius	Mozambique	Zimbabwe	Tanzania	Zambia
1997	0.10	6.98	16.04	0.34	14.03	9.90	0.70	5.34
1998	0.08	0.37	15.81	0.30	14.36	10.51	0.63	7.25
1999	0.72	0.22	15.39	0.52	18.70	10.52	0.72	5.96
2000	0.12	0.12	10.02	0.42	12.45	10.78	0.57	7.65
2001	0.02	0.45	8.95	1.16	4.08	9.68	0.83	9.25
2002	0.17	0.12	10.94	0.54	4.33	13.51	1.39	14.51

Source: World Trade Tables, Quantec

The above tables illustrate the intra-regional trade patterns within the SADC.[6] On the import side the countries most dependent on imports from SA are Zambia, which imports on average 60.4 per cent of its goods and services during the period 1997 to 2002 from within the region, followed by Zimbabwe (54.6 per cent), Mozambique (53.5 per cent) and Malawi (52 per cent). On the export side SADC countries tend to be less dependent on SA: 12.9 per cent of Malawi's exports during the period 1997 to 2002 are to SA, followed again by Mozambique (11.3 per cent), Zimbabwe (10.8 per cent) and Zambia (8.3 per cent).

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[6] Between the period 1997 and 2002, SA imported mainly agricultural and mineral products from other SADC members, while its exports to the SADC comprised manufactured products.

Appendix I illustrates that from 1997 onwards, Mozambique and Zambia have shown relative synchronized co-movement with South Africa. This trend is also evident in idiosyncratic components between South Africa and these tow countries – see Table 3. In contrast, the synchronization between SA and Zimbabwe started to deviate after 1998, when the political instability in the latter country became more pronounced. This conclusion is consistent with those of Arora and Vamvakidis (2005). They infer that when the SA economy experiences high growth, exports increase, which in turn encourages economic activities in the recipient country. Hence, South African growth affects, specifically, SADC members' growth through trade. However, the intra-regional trade is asymmetric with South African exports to the region exceeds its imports from SADC members.

There are several factors that can explain the still limited extent of intraregional trade within the SADC. Firstly, poor infrastructure in most member countries prohibits South African businesses from exploring untapped African markets. Apart from the closest South African neighbours, there is a lack of communication networks between countries. Related to infrastructure is the high cost of transportation, especially for landlocked countries. This makes it difficult to travel from one port to another. For example, it is far easier to transport goods from South Africa to Botswana than to carry them to DRC.

Secondly, tariffs within the SADC are still very high. High tariffs on imported goods make a sizeable portion of an individual country's fiscal revenue. Thus, lowering or eliminating these tariffs will amount to a massive loss of revenue for many states in the region. Consequently, countries seem somewhat reluctant to push for a rapid free trade agreement (FTA). It was only in March 2004 that the SADC set a timetable for the implementation of a common external tariff in 2010.

Thirdly, and most importantly, SADC member countries export and import similar products, which illustrates a lack of diversification and specialization. They all predominantly export natural resources and import finished and manufactured goods. Under these conditions, it is hard to have a productive and mutually beneficial

intraregional trade. As mentioned above, South Africa benefits from trading with its SADC partners because it exports manufactured goods, while it imports mainly agricultural and mineral products. In this regard, South Africa has, within the SADC, to compete with industrial countries which have already established long-term trading ties with Africa.

7   Conclusions and policy implications

SADC is a diverse region with South Africa as the dominant economic force. Within this context the dynamic factor model used in the analysis allows us to study the co-movement of this diverse region in a unique way.

By using this model, South Africa as the regional leader shows strong co-movement with the world business cycle. However, the evidence on co-movement between SA and SADC countries proved to be weak. The South African idiosyncratic component explains only 10 per cent, 18 per cent, 12 per cent and 8 per cent, respectively, of the variation of the aggregate SADC cycle and the cycles of Mozambique, Zambia, and Lesotho. It is clear that in general SA does not yet have a considerable economic influence in the region.

The disaggregated co-movement between the South African common components and those in SADC indicates that the strongest correlation for the entire period exists between South Africa and Swaziland, Botswana, Zimbabwe, DRC, Lesotho, and Angola; followed by weaker correlations between South Africa and Mauritius, Malawi, Namibia, and Zambia. In the SACU member countries strong evidence exists of co-movement, with the exception of Namibia. Strong co-movement was also evident between South Africa and Zimbabwe until 1998. This can be explained by the strong trade relations between the two countries, which have since weakened due to the recent political turmoil. Since 1998 Zimbabwe has shown more of an idiosyncratic component in its growth rate than commonality with South Africa.

For the purpose of this article we have identified one factor as possible source of synchronization of business cycles within the SADC region, namely intra-regional trade. The intra-regional trade pattern shows that the dominant countries are Zambia, Zimbabwe, Mozambique and Malawi. However, on the export side, SADC countries tend to be less dependent on South Africa.

The study concludes that, although co-movement in the region exists, it is weaker than expected and mainly driven by intra-regional trade. The region has not fully utilized its geographic proximity and the intra-regional benefits this can hold for the SADC. Most of the SADC countries are currently not benefiting from the strength and diversifying nature of the South African economy.

The policy implications of this study reveal that political stability is of the utmost importance for the region. South Africa possesses stable institutions, respect of rule of law, and a stable political environment. In contrast, some SADC countries are characterized by the occurrence of tribal and ethnic conflict leading to wars. Angola is just emerging from a long civil war, the DRC has been ravaged by nearly a decade of civil war, and Zimbabwe is suffering from political instability. This causes instability for the region as a whole.

The improvement of intra-regional trade could also be enhanced by improvements in infrastructure – especially the transport and communication infrastructure – as well as tariff liberalization within the region. Furthermore, the overlapping memberships between different regional organizations remain a considerable obstacle to achieving the goal of regional integration (Arora and Vamvakidis, 2005). The majority of the non-SACU members belong to different regional organizations, such as EAC (East African Community) and COMESA (Common Market for Eastern and Southern Africa). These organizations have different agendas concerning the sequencing of integration. Unless there is a harmonization of objectives, it will be difficult to achieve the market integration of these organizations. Arora and Vamvakidis (2005) suggest a change in membership to solve the overlapping membership issue. Hence, South Africa – with its entrenched bond

with the SACU – will remain a member of the SADC; which in turn excludes DRC, Tanzania, Malawi, Mauritius, Zambia, and Zimbabwe.

The lack of financial sophistication in the region is indirectly hampering trade. Evidence in other regions indicates that the expansion of financial integration could enhance trade integration. In this respect South Africa could fulfill an important role in facilitating this development in SADC.

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Appendix AI: South African and individual SADC countries common components
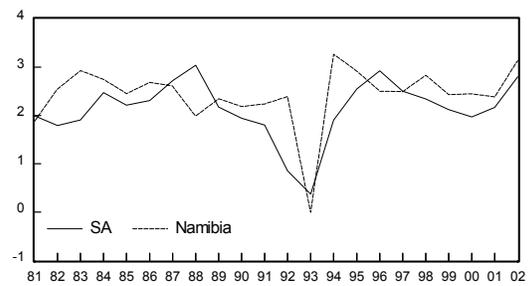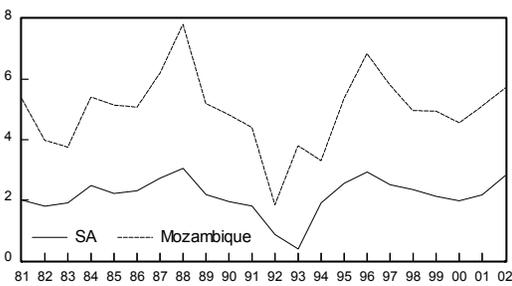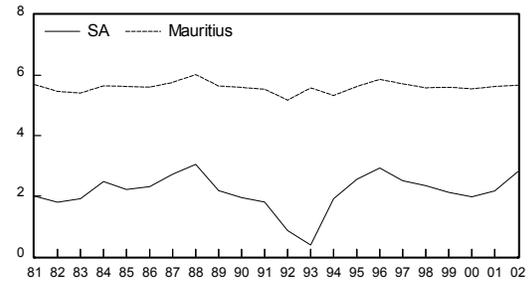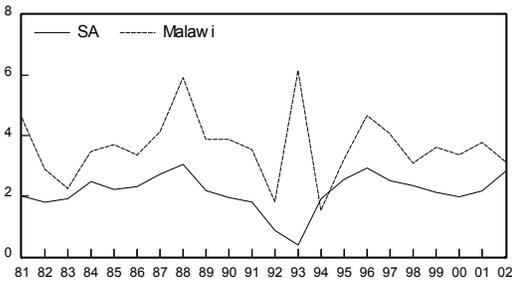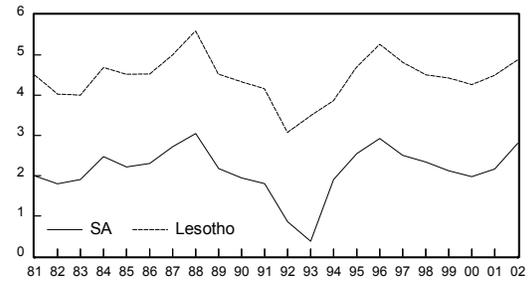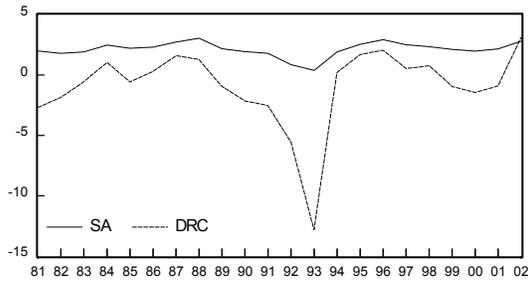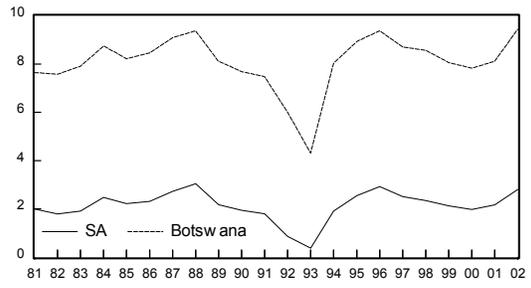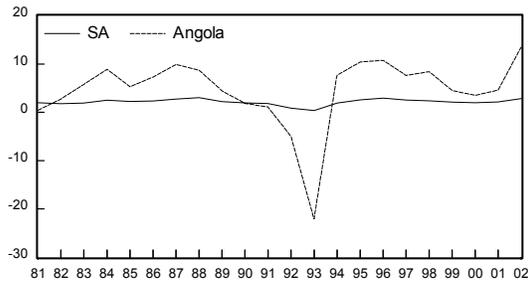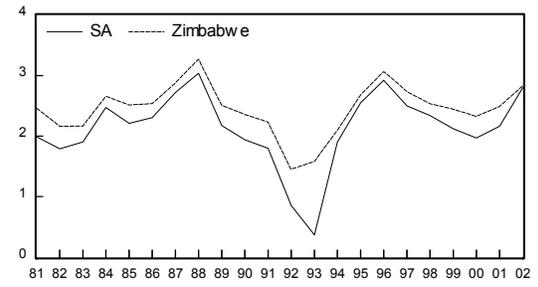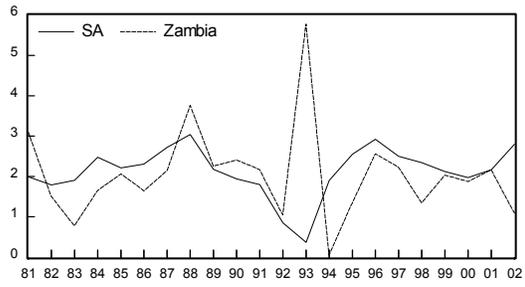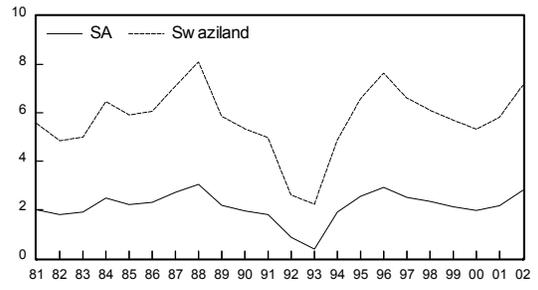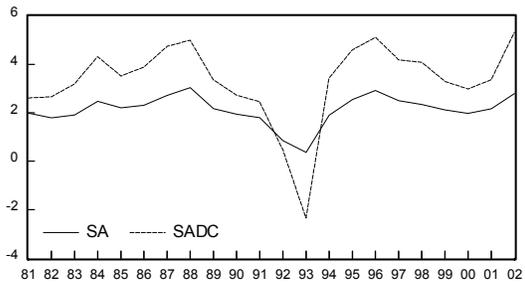
Appendix AII: Co-movement between the SA and individual G7 countries