

IMF Working Paper

© 1999 International Monetary Fund

This is a *Working Paper* and the author(s) would welcome any comments on the present text. Citations should refer to a *Working Paper of the International Monetary Fund*. The views expressed are those of the author(s) and do not necessarily represent those of the Fund.

WP/99/105

INTERNATIONAL MONETARY FUND

African Department

Measuring Financial Development in Sub-Saharan Africa

Prepared by Enrique A. Gelbard and Sérgio Pereira Leite¹

August 1999

Abstract

This study introduces an index for measuring financial development and a set of six indices representing key characteristics of the financial systems in 38 sub-Saharan African countries. The results show that these countries have made good progress in improving and modernizing their financial systems during the last decade, particularly with regard to financial liberalization and the adoption of indirect instruments of monetary policy. In many countries, however, the range of financial products remains extremely limited, interest rate spreads are wide, capital adequacy ratios are insufficient, judicial loan recovery is a problem, and the share of nonperforming loans is large.

JEL Classification Numbers: E44, G20, O16

Keywords: financial development, measurement, Africa

Author's E-Mail Addresses: egelbard@imf.org and sleite@imf.org

¹This paper could not have been written without the contributions of desk economists in the IMF's African Department, who compiled the information on individual countries. We thank David T. Coe, Ross Levine, and Andrea Schaechter for their useful comments on an earlier version of this paper, while absolving them of responsibility for any remaining errors. The research assistance of Naly Carvalho and Ali Diallo and the editorial assistance of Thomas Walter are also gratefully acknowledged.

	Contents	Page
I.	Introduction	3
II.	Financial Development in sub-Saharan Africa	4
III.	Traditional Measures of Financial Development	5
IV.	A Comprehensive Index of Financial Development	8
V.	Findings	10
	A. Market Structure	10
	B. Financial Products	16
	C. Financial Liberalization	17
	D. Institutional Environment	18
	E. Financial Openness	18
	F. Monetary Policy Instruments	22
VI.	Regression Analysis	23
VII.	Conclusions	26
Boxes		
1.	Market Structure Index	15
2.	Financial Products Index	16
3.	Financial Liberalization Index	17
4.	Institutional Environment Index	18
5.	Financial Openness Index	19
6.	Monetary Policy Instruments Index	23
Tables		
1.	Sub-Saharan Africa: Financial Development Index, 1987-97	12
2.	Sub-Saharan Africa: Financial Development Indicators, 1987-97	14
3.	Sub-Saharan Africa: Financial Development Indicators, 1987-97	21
4.	Estimates of the Growth Equation	25
Figures		
1.	Sub-Saharan Africa: Financial Deepening Indicators, 1980-97	7
2.	Sub-Saharan Africa: Overall Financial Development Indicator, 1987-97	11
3.	Financial Development Index, 1997	11
4.	Sub-Saharan Africa: Financial Development Indicators, 1987-97	13
5.	Sub-Saharan Africa: Financial Development Indicators, 1987-97	20
	References	27

I. INTRODUCTION

A developed and well-functioning financial sector is a key component of an economy, facilitating the exchange of goods and services, mobilizing savings, allocating resources, and helping diversify risks. Since the work of Goldsmith (1969), McKinnon (1973), and Shaw (1973), a growing body of literature has affirmed the importance of financial development to economic growth.² A question that remains, however, is how to measure financial development. Moreover, it would be helpful if one could identify those aspects of financial development that are important for improving economic performance.

Since financial development is not easily measurable, studies attempting to link financial deepening with growth, savings, and investment have chosen a number of proxies; most of them have used monetary aggregates, with mixed results. The purpose of this study is to document the progress achieved by sub-Saharan African countries in revamping their financial systems over the last decade. Rather than using monetary aggregates, this study uses a survey of financial sector characteristics in sub-Saharan African countries to construct a set of indices of financial development. The analysis of these indices allows us to take a closer look at the financial structure of the countries reviewed and to draw some conclusions about the reforms required to promote further financial development in the region.

Section II provides an overview of financial development in sub-Saharan African countries. Section III looks at the indices of financial development that have been used in the literature and applies them to sub-Saharan Africa. Section IV proposes alternative measures of financial development constructed on the basis of detailed information on the financial systems of 38 sub-Saharan African countries. Section V discusses the results, and Section VI incorporates these measures in a regression analysis of economic growth during the 1987-97 period. Section VII contains concluding comments.

²For a recent survey of the literature, see Levine (1997). The empirical literature on this issue is extensive, but its results—although somewhat supportive of the Goldsmith-McKinnon-Shaw paradigm—are not totally conclusive. On one hand, Fry (1978 and 1988), Harris (1979), Lanyi and Saracoglu (1983), Gelb (1989), and King and Levine (1993a and 1993b) provide results that are supportive of the financial deepening paradigm. On the other hand, empirical tests conducted by Agarwala (1983) and Khatkhate (1988), among others, have failed to lend support to it. Some economists, such as Robinson (1952), believe that causality runs from economic growth to financial deepening. Their hypothesis is that economic growth creates the conditions for the development of financial markets, which otherwise could not take place. Patrick (1966) suggests that, in the early stage of development, financial development may lead growth, but, in the later stages, growth is likely to determine the speed of financial development.

II. FINANCIAL DEVELOPMENT IN SUB-SAHARAN AFRICA

At independence, most sub-Saharan African countries had relatively simple financial systems geared toward financing foreign trade. Financing of other domestic activities was limited, and there was little need for monetary policy expertise, owing to the prevalence of rules-based fixed exchange rate regimes.

Financial development in sub-Saharan Africa in the postindependence period often suffered on account of misguided efforts to speed up economic growth through government intervention. In many countries, the provision of credit was seen as a powerful instrument of economic development, and the banking system was nationalized, and/or state-owned banks were created. The result was often inefficient resource allocation, inflationary refinancing by the central bank of commercial bank operations, and absorption by the government (directly or through the central bank) of banking losses. The banking system provided few satisfactory services, had a high proportion of nonperforming loans, often to public enterprises, and quickly became undercapitalized. Bank supervision was inadequate, and, as a result, the banking system suffered a number of problems owing to mismanagement and fraud.³

Most sub-Saharan African countries believed that it would be possible to accelerate economic development by identifying promising sectors and using subsidized credit and selective credit controls to promote them. Interest rates were maintained at levels that were negative in real terms, and widespread regulations forced banks to provide credit to priority sectors at subsidized rates. The result was often misallocation of resources and credit rationing. The priority sectors seldom showed a performance that justified the measures taken, and growth rates in the early 1980s were generally insufficient to raise income per capita. Attempts at inflationary financing further damaged economic development in many countries.

The collapse of the interventionist policies in the mid-1980s prompted many countries to embark on a reform agenda that included liberalizing interest rates, eliminating credit controls, restructuring and privatizing commercial banks, adopting indirect instruments of monetary policy, and developing financial markets.⁴ These policies were generally implemented within Fund-supported structural adjustment programs. However, not all countries moved quickly enough with the reform process, and in a number of cases financial sector problems were allowed to recur, with the result that a new round of financial reforms had to be implemented in the mid-1990s.

³This happened even in countries where the banking system remained in private hands after independence.

⁴A review of the status of financial sector reforms in sub-Saharan Africa is provided in Mehran and others (1998).

III. TRADITIONAL MEASURES OF FINANCIAL DEVELOPMENT

The difficulty in measuring financial development has been recognized in the literature, and the limitations of using monetary aggregates have been highlighted. Pill and Pradhan (1995) explain that “conventional measures of financial deepening, such as the level of real interest rates and the ratio of broad money to GDP, may give misleading signals about the success of [financial] reform and its implications for real activity.” They assert that these indicators overlook important factors, such as the openness of the country to capital flows, the extent of public borrowing from the domestic financial system, the development of nonbank financial intermediation, and the competitiveness of the banking sector. Another factor that has been overlooked until recently is the existence of a legal environment that protects the rights of creditors and enforces contracts. As shown by La Porta and others (1997), such an environment tends to be associated with more developed and efficient debt and equity markets. Therefore, by analyzing the institutional environment and the incentive structure in which bank managers, auditors, and depositors operate, one may be able to draw conclusions about the level of financial development of a country.

Pill and Pradhan identify three stages of financial development: a financially repressed economy (FRE); a domestically liberalized economy (DLE); and an internationally liberalized economy (ILE). This characterization of financial liberalization corresponds, albeit in a stylized way, to the “optimal” order of economic liberalization advocated by McKinnon (1982 and 1993), among others. During the initial phase—corresponding to the transition from an FRE to a DLE—domestic controls on interest rates are removed, allowing market-clearing rates to be established. Capital account restrictions are abolished only in the final stages of the liberalization program.

Using a simple Fisherian model, Pill and Pradhan look into four indicators of financial development: (a) broad money, (b) base money, (c) bank credit to the private sector, and (d) real interest rates. They conclude that private sector credit is the only indicator that can be expected to be directly correlated with financial development. Real interest rates in the DLE stage are likely to be higher than in the ILE stage. Broad money is also expected to be higher in the DLE than in the other two stages. The relationship between base money and financial development cannot be determined a priori, as it is determined by the authorities’ choice of fiscal and monetary policy. While credit to the private sector is the most appropriate financial deepening indicator among the generally available ones, it is not perfect either. Its relationship to financial development could be affected by financial innovation, in particular by the emergence of nonbank credit, and by commercial bank lending to other financial intermediaries.

Pill and Pradhan speculate that a better (but seldom available) indicator would be nonbank credit to the private sector. They test their findings for a sample of countries in Africa and in Asia. Results seem adequate for Asia. For Africa, however, all financial variables, including the preferred private sector credit indicator, move erratically, even in the postliberalization period, and they appear to have little explanatory power for developments in the real

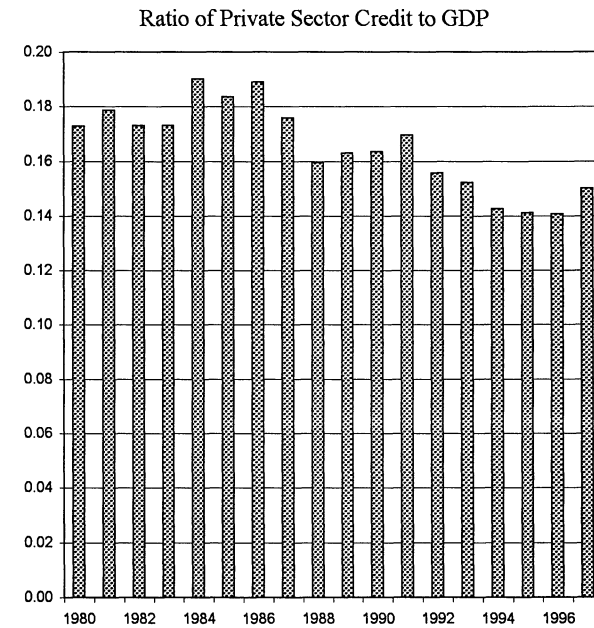
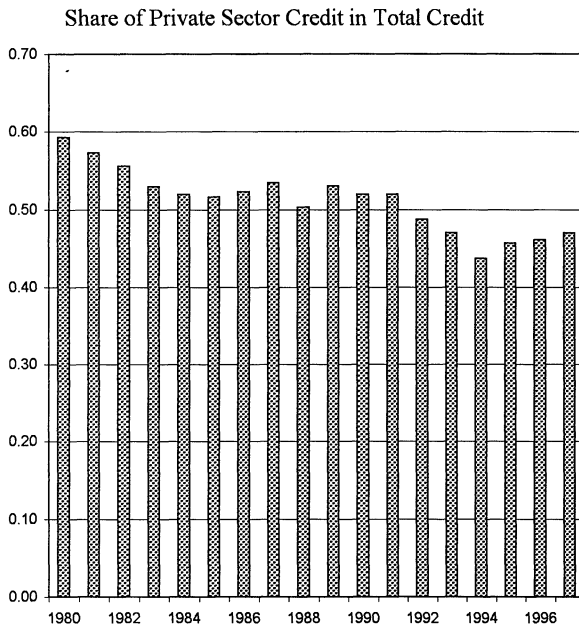
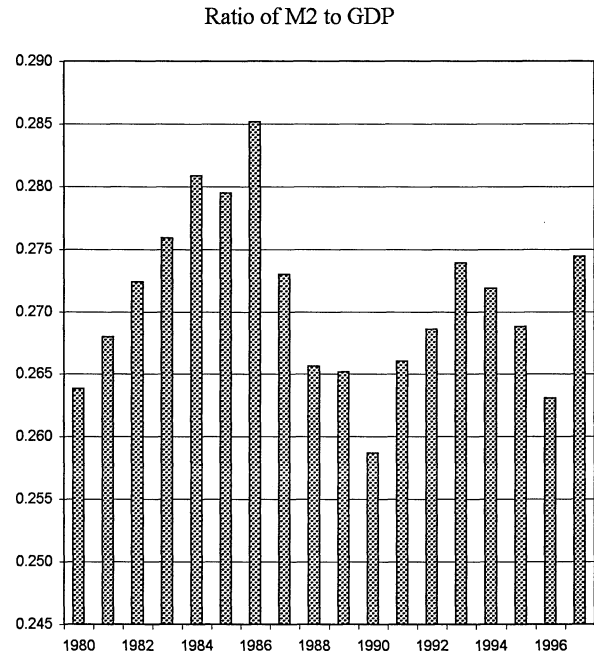
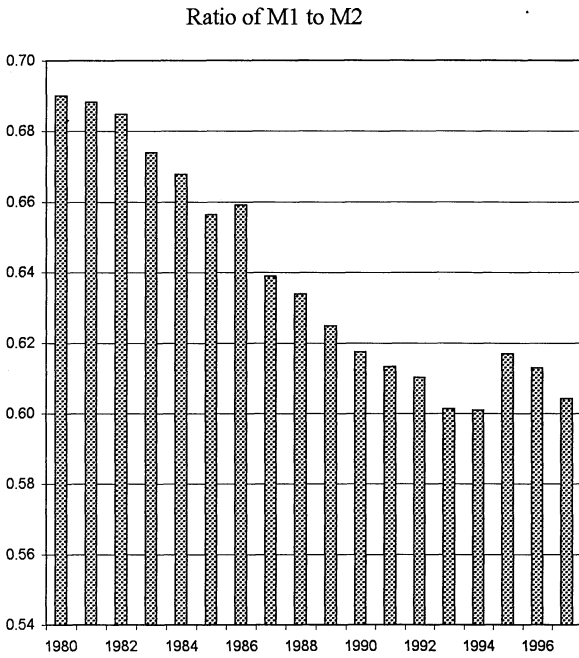
economy. It seems that a wide, private sector credit aggregate is the preferred financial indicator in countries where financial liberalization has created a well-behaved commercial banking sector and the capital account in the balance of payments has been open. For other countries, none of the usual financial deepening indicators seem adequate.

Other studies have also used monetary aggregates as a measure of financial development. King and Levine (1993a) relate real GDP per capita growth to nine different indices of financial deepening: (a) narrow money to GDP; (b) broad money to GDP; (c) quasi money to GDP; (d) central bank domestic credit to GDP; (e) commercial bank domestic credit to GDP; (f) gross claims on the private sector to GDP; (g) commercial bank domestic credit to total domestic credit; (h) claims on nonfinancial private sector to total domestic credit; and (i) claims on the private sector by nondeposit money banks to GDP. Johnston and Pazarbasioglu (1995) use a combination of three variables to reflect the different aspects of financial development: the interest cost of capital (real interest rate), the volume of intermediation (the ratios of credit to the private sector to GDP and of broad money to GDP) and financial sector efficiency (gross spread between the average lending and deposit rates and the ratio of base money to deposits).⁵ Other indices of financial deepening are also used in the literature: Goldsmith (1969) uses the ratio of financial institutions assets to GDP; Fry (1988) uses rural population per rural bank branch; and Levine and Zervos (1998) use measures of stock exchange liquidity (total value of shares traded divided by GDP and the turnover ratio). Rother (1999) uses the money multiplier and the ratio of private sector credit to base money.

The progress of financial development in sub-Saharan Africa cannot be easily assessed by looking into some of the usual indicators, such as the ratio of narrow to broad money (M1 to M2), the ratio of M2 to GDP, the share of private sector credit in total credit, and the ratio of private sector credit to GDP. Figure 1 shows the evolution of these indices for a sample of 38 sub-Saharan countries during the 1980-97 period. Financial development is associated with an increased importance of term deposits and thus with a lower ratio of narrow to broad money; meanwhile, the last three indicators should be directly correlated with the level of financial development. Judging from the M1-to-M2 ratio, there has been a steady process of development over time; however, the other three indicators show an oscillating behavior, and two of them suggest a lower level of financial development at the end of the period than in 1980.

⁵Johnston and Pazarbasioglu's paper takes the approach of Barro (1991) and uses panel data for 40 countries to investigate the determinants of growth. Their results suggest that the interest cost of capital, the volume of intermediation, and the efficiency of intermediation can be separately identified as explaining economic growth. They also find that the impact of financial development on economic growth is very different in repressed and reformed financial systems, and in countries that have experienced financial crises and those that have not.

Figure 1. Sub-Saharan Africa: Financial Deepening Indicators, 1980-97 1/



Source: IMF *International Financial Statistics* database.

1/ Average for 38 Sub-Saharan African countries.

Even setting aside theoretical reasons, there are a number of difficulties in assessing financial development on the basis of trends in monetary aggregates, particularly in countries that are at an early stage of development. First, many of the indices depend on GDP (or GNP) as a scale variable, but national account statistics are often weak in developing countries.⁶ Second, domestic credit is a net concept (net of government deposits) that is very sensitive to the policy stance. Third, measures of private sector credit are normally contaminated by credit to public enterprises. Fourth, the ratio of money to GDP is closely related to monetary policy and the demand for money, and it fluctuates for reasons that are unrelated to financial development. Fifth, all these indicators overlook other important aspects of financial development, such as the legal and regulatory environments.

IV. A COMPREHENSIVE INDEX OF FINANCIAL DEVELOPMENT

A significant part of the early literature on financial development has focused on financial liberalization and the avoidance of administratively set—and often negative—real interest rates. This focus explains the widespread use of real interest rates as a measure of financial deepening. Lack of financial repression, however, is just one aspect of financial development.

A thorough assessment of a financial system should consider at least six areas: (a) the market structure and competitiveness of the system; (b) the availability of financial products; (c) the degree of financial liberalization; (d) the institutional environment under which the system operates; (e) the degree of integration with foreign financial markets (financial openness); and (f) the degree of sophistication of the instruments of monetary policy. The approach used in this study is to compute separate indices to reflect each of the areas identified above, as well as an overall index of financial development.

Each of these areas can be thought of as represented by a number of specific characteristics or attributes. We obtained these characteristics from a survey of 38 sub-Saharan African countries and grouped them into six indices: a **market structure index**, a **financial products index**, a **financial liberalization index**, an **institutional environment index**, a **financial openness index**, and a **monetary policy instruments index**. All indices are measured on a 0-100 scale. Countries have been grouped in four broad categories, depending on the quartile in which their overall index falls: “undeveloped,” “minimally developed,” “somewhat developed,” and “largely developed.” To allow for a comparison over time, these indices were constructed for 1987 and 1997. The higher the value of the index, the higher is the degree of financial development in that area.

To construct each index, answers to individual yes/no questions were assigned dichotomous values of zero and 100, while answers to questions related to time periods or to quantitative variables (i.e., share of nonperforming loans) were converted into a 0-100 scale based on the

⁶Also, most of the variables used in the numerator of the indices of financial deepening are stocks while the denominator, GDP, is a flow concept.

range of values of the whole sample. The conversion of the values is carried out according to the following formula:

$$d_{ij} = [(k_{ij} - \min_{i=1, \dots, n} k_{ij}) / (\max_{i=1, \dots, n} k_{ij} - \min_{i=1, \dots, n} k_{ij})] * 100, \quad (1)$$

where i indicates the n countries for which information is available, j indicates the m attributes being measured, k_{ij} is the value of attribute j for country i , and d_{ij} is the measurement within the 0-100 scale of that attribute.⁷

Each index is subsequently constructed as a simple average of the values associated with the attribute:

$$\text{Index}_i = [\sum_{j=1, \dots, m} d_{ij} + \sum_{j=1, \dots, m} e_{ij}] / m, \quad (2)$$

where e_{ij} represents the values of each dichotomous answer.⁸ For each country's financial system, the overall index of financial development is computed as the average value of all of its attributes.

The indices were compiled on the basis of a questionnaire that was sent to country economists of the African Department of the IMF. The questionnaire covered data for 1997; information for 1987 was primarily gleaned by the authors from different sources and then reviewed by IMF country economists. These economists typically sent the questionnaire to the country authorities and/or IMF resident representatives requesting their input to ensure the accuracy of responses. The results were reviewed for consistency among countries, and whenever discrepancies were detected, a new round of discussions was carried out. In particular, questionnaires from countries in the CFA franc area were compared against each other to ensure that they accurately reflected practices that were common for countries having the same regional central bank. Little guidance was provided on judgmental questions, except that we were interested in the "considered opinion of practitioners."⁹ Data on financial openness were primarily obtained from the IMF database on exchange restrictions.

The limitations of these indices are worth mentioning. First, the choice of attributes included is judgmental and is conditioned by data availability. Second, the nature of the questions posed

⁷For those variables for which a higher figure is associated with a less desirable feature of the financial system (e.g., share of nonperforming loans), formula (1) becomes

$$d_{ij} = [(k_{ij} - \max_{i=1, \dots, n} k_{ij}) / (\min_{i=1, \dots, n} k_{ij} - \max_{i=1, \dots, n} k_{ij})] * 100.$$

⁸There is only one exception to this general approach. In the financial products index, a score of 100 can be obtained in the category of interbank markets if at least three different types of interbank markets are in existence, and 66.6 (33.3) if two (one) are (is) in place.

⁹Data on individual attributes are available upon request from the authors.

in the survey is such that the answer could be affected by the respondent's subjective assessment of the situation. Third, all attributes are assumed to be equally important when computing the indices, an assumption that may not match reality.

V. FINDINGS

One of the main findings of the study is that significant financial development took place in the 1987-97 period. As seen in Figure 2 and Table 1, the number of countries with somewhat or largely developed financial systems increased from 2 countries (Mauritius and South Africa) in 1987 to 27 countries in 1997. The number of countries with totally undeveloped financial systems declined from 8 countries in 1987 (Angola, Republic of Congo, Eritrea, Ethiopia, Lesotho, Malawi, Mozambique, and São Tomé and Príncipe) to 2 countries in 1997 (Angola and Ethiopia). According to the results, the 5 countries with the most developed financial systems in 1997 were South Africa, Mauritius, Ghana, Kenya, Zambia, and Namibia (Figure 3).

A. Market Structure

The market structure index measures the strength and competitiveness of the financial system based on selected characteristics of markets and institutions (Box 1). The results, displayed in Figure 4 and Table 2, indicate that in 1997 most countries (31 countries) were in the top two quartiles of the distribution, and that 9 countries appeared to have quite strong and competitive market structures (South Africa, Botswana, Namibia, Mozambique, Nigeria, Ghana, Burkina Faso, Gabon, and Mauritius).¹⁰

Regarding capital adequacy ratios, in 1997 slightly less than half of the countries had regulations that matched those proposed by the Basle Committee on Banking Supervision. In the case of Ghana, Mauritius, and Zambia, the required risk-based capital adequacy ratios exceeded the 8 percent proposed by the Committee. However, 14 countries had a minimum capital adequacy requirement of 4 percent or less, which is clearly insufficient.

¹⁰Given the lack of data for the attributes of this index in 1987, the index computed for this year reflects only the different values assigned to the interest rate spread. Thus, the figures for 1987 turn out to be only slightly different from those for 1997 and do not allow for a proper comparison between the two years.

Figure 2. Sub-Saharan Africa: Overall Financial Development Indicator, 1987-97 ^{1/}

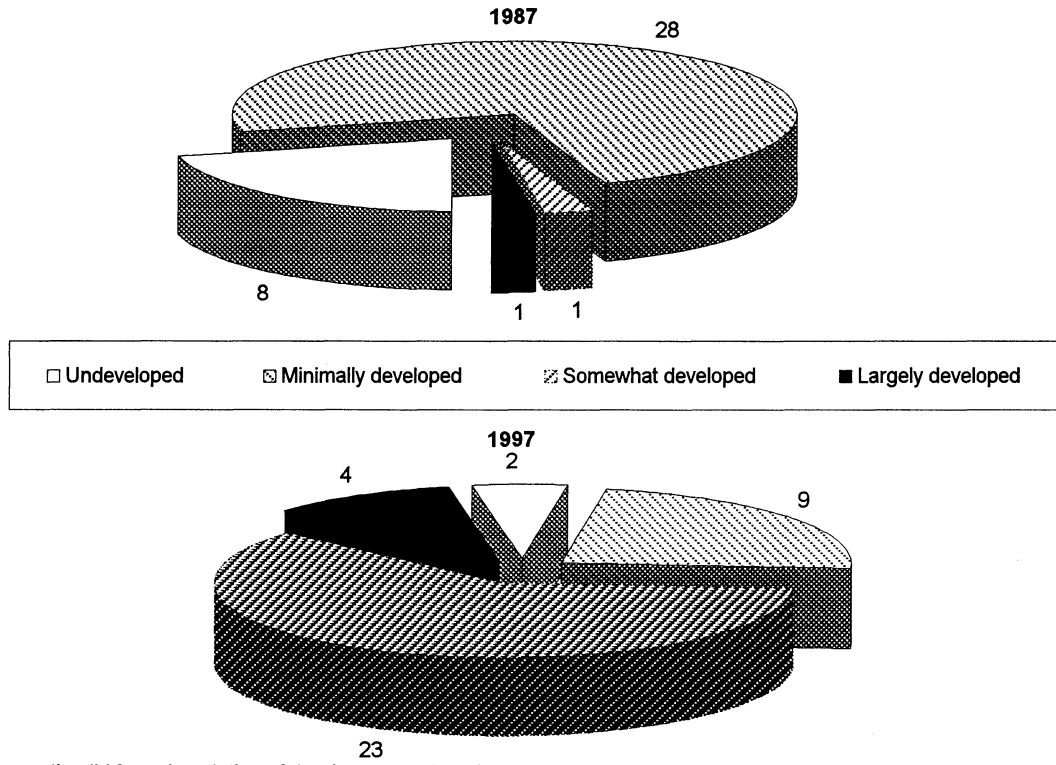


Figure 3. Financial Development Index, 1997
Countries Arranged by Quartile

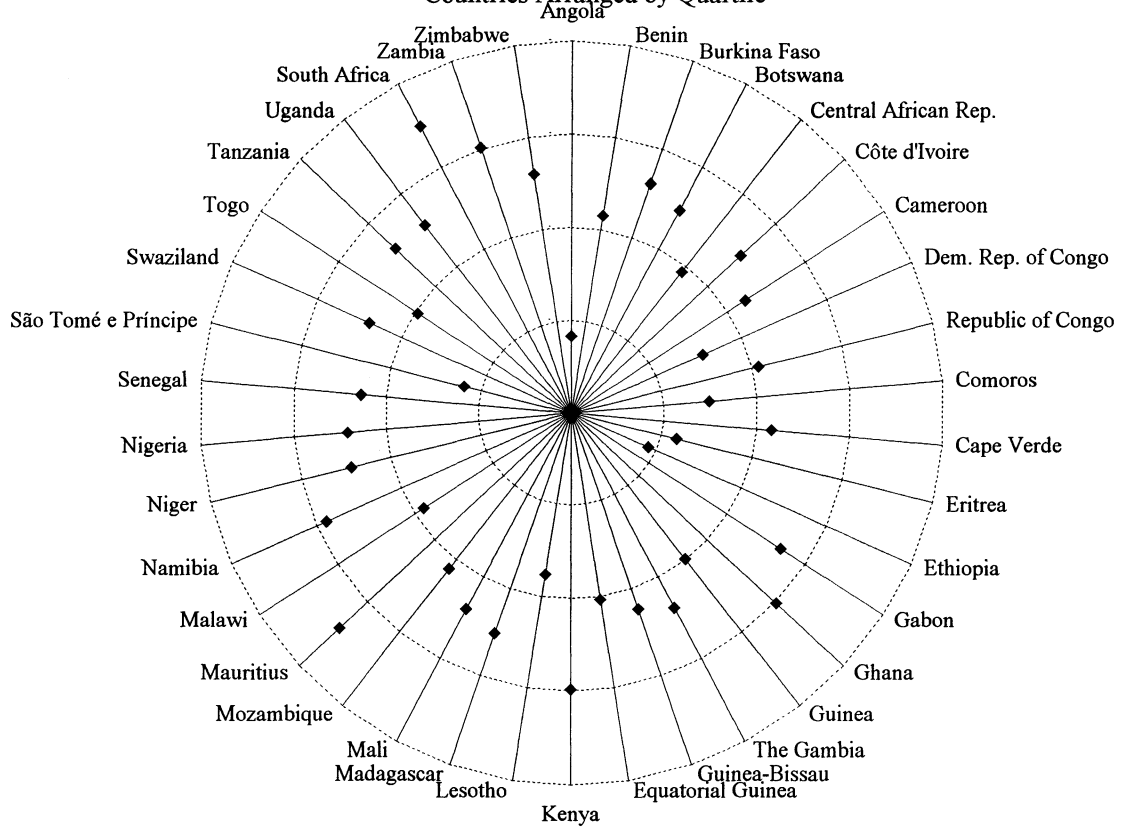


Table 1. Sub-Saharan Africa: Financial Development Index, 1987-97 ^{1/}

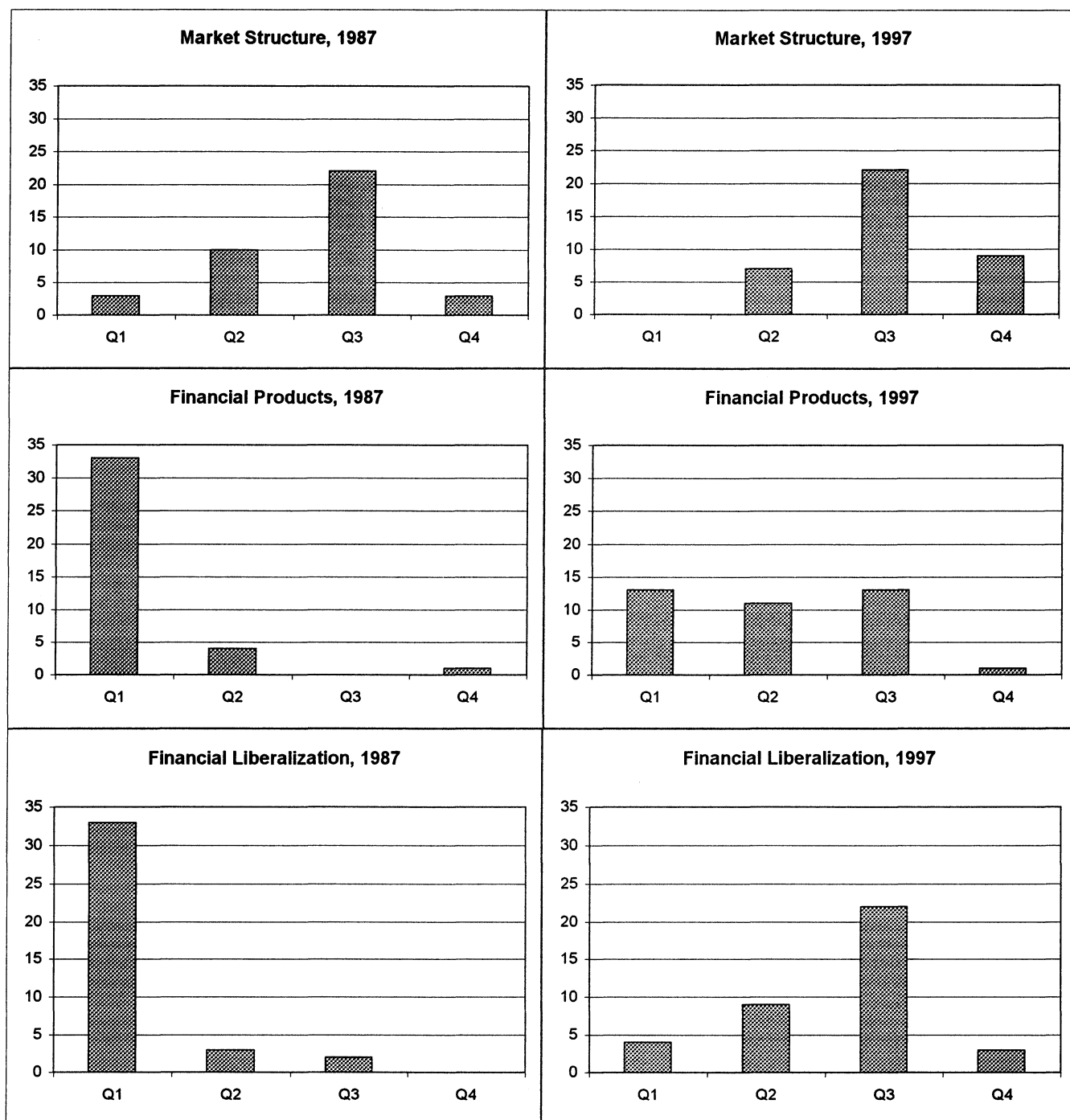
Country	Overall Financial Development			
	1987		1997	
	Index	Quartile	Index	Quartile
Angola	9	Undeveloped	21	Undeveloped
Benin	29	Minimally developed	54	Somewhat developed
Burkina Faso	35	Minimally developed	65	Somewhat developed
Botswana	47	Minimally developed	62	Somewhat developed
Central African Rep.	30	Minimally developed	48	Minimally developed
Côte d'Ivoire	41	Minimally developed	62	Somewhat developed
Cameroon	29	Minimally developed	56	Somewhat developed
Dem. Rep. of Congo	27	Minimally developed	39	Minimally developed
Republic of Congo	20	Undeveloped	52	Somewhat developed
Comoros	30	Minimally developed	37	Minimally developed
Cape Verde	34	Minimally developed	54	Somewhat developed
Eritrea	22	Undeveloped	29	Minimally developed
Ethiopia	9	Undeveloped	23	Undeveloped
Gabon	38	Minimally developed	67	Somewhat developed
Ghana	31	Minimally developed	75	Largely developed
Guinea	30	Minimally developed	50	Minimally developed
The Gambia	43	Minimally developed	60	Somewhat developed
Guinea-Bissau	33	Minimally developed	56	Somewhat developed
Equatorial Guinea	26	Minimally developed	51	Somewhat developed
Kenya	44	Minimally developed	75	Somewhat developed
Lesotho	20	Undeveloped	44	Minimally developed
Madagascar	38	Minimally developed	63	Somewhat developed
Mali	30	Minimally developed	60	Somewhat developed
Mozambique	24	Undeveloped	53	Somewhat developed
Mauritius	62	Somewhat developed	85	Largely developed
Malawi	24	Undeveloped	47	Minimally developed
Namibia	42	Minimally developed	72	Somewhat developed
Niger	38	Minimally developed	61	Somewhat developed
Nigeria	27	Minimally developed	61	Somewhat developed
Senegal	33	Minimally developed	57	Somewhat developed
São Tomé e Príncipe	22	Undeveloped	30	Minimally developed
Swaziland	43	Minimally developed	60	Somewhat developed
Togo	29	Minimally developed	49	Minimally developed
Tanzania	30	Minimally developed	65	Somewhat developed
Uganda	36	Minimally developed	64	Somewhat developed
South Africa	77	Largely developed	87	Largely developed
Zambia	47	Minimally developed	75	Largely developed
Zimbabwe	38	Minimally developed	65	Somewhat developed
Average	33	Minimally developed	56	Somewhat developed

Sources: IMF; and data provided by country authorities.

^{1/} See section IV for description of index and categories corresponding to the four quartiles.

Figure 4. Sub-Saharan Africa: Financial Development Indicators, 1987-97 ^{1/}

(Number of countries in each quartile)



1/ See Section IV for a description of categories corresponding to the four quartiles.

Table 2. Sub-Saharan Africa: Financial Development Indicators, 1987-97 ^{1/}

Country	Market Structure				Financial Products				Financial Liberalization			
	1987		1997		1987		1997		1987		1997	
	Index	Quartile	Index	Quartile	Index	Quartile	Index	Quartile	Index	Quartile	Index	Quartile
Angola	31	Minimally developed	31	Minimally developed	3	Undeveloped	16	Undeveloped	0	Repressed	23	Repressed
Benin	65	Somewhat developed	74	Somewhat developed	4	Undeveloped	8	Undeveloped	20	Repressed	43	Minimally liberalized
Burkina Faso	63	Somewhat developed	78	Largely developed	11	Undeveloped	38	Minimally developed	20	Repressed	73	Somewhat liberalized
Botswana	76	Largely developed	92	Largely developed	17	Undeveloped	51	Somewhat developed	20	Repressed	65	Somewhat liberalized
Central African Rep.	40	Minimally developed	41	Minimally developed	2	Undeveloped	14	Undeveloped	20	Repressed	23	Repressed
Côte d'Ivoire	58	Somewhat developed	71	Somewhat developed	25	Minimally developed	54	Somewhat developed	20	Repressed	68	Somewhat liberalized
Cameroon	58	Somewhat developed	59	Somewhat developed	7	Undeveloped	45	Minimally developed	40	Minimally liberalized	39	Minimally liberalized
Dem. Rep. of Congo	59	Somewhat developed	61	Somewhat developed	8	Undeveloped	4	Undeveloped	20	Repressed	50	Somewhat liberalized
Republic of Congo	15	Undeveloped	27	Minimally developed	3	Undeveloped	7	Undeveloped	20	Repressed	63	Somewhat liberalized
Comoros	55	Somewhat developed	56	Somewhat developed	2	Undeveloped	2	Undeveloped	20	Repressed	27	Minimally liberalized
Cape Verde	26	Minimally developed	41	Minimally developed	19	Undeveloped	56	Somewhat developed	0	Repressed	47	Minimally liberalized
Eritrea	38	Minimally developed	39	Minimally developed	9	Undeveloped	9	Undeveloped	0	Repressed	3	Repressed
Ethiopia	19	Undeveloped	41	Minimally developed	2	Undeveloped	18	Undeveloped	0	Repressed	7	Repressed
Gabon	62	Somewhat developed	77	Largely developed	5	Undeveloped	5	Undeveloped	20	Repressed	64	Somewhat liberalized
Ghana	66	Somewhat developed	79	Largely developed	11	Undeveloped	75	Somewhat developed	20	Repressed	45	Minimally liberalized
Guinea	62	Somewhat developed	72	Somewhat developed	11	Undeveloped	11	Undeveloped	20	Repressed	63	Somewhat liberalized
The Gambia	62	Somewhat developed	62	Somewhat developed	3	Undeveloped	20	Undeveloped	44	Minimally liberalized	69	Somewhat liberalized
Guinea-Bissau	62	Somewhat developed	63	Somewhat developed	3	Undeveloped	37	Minimally developed	20	Repressed	30	Minimally liberalized
Equatorial Guinea	47	Minimally developed	57	Somewhat developed	1	Undeveloped	1	Undeveloped	20	Repressed	69	Somewhat liberalized
Kenya	47	Minimally developed	56	Somewhat developed	13	Undeveloped	55	Somewhat developed	20	Repressed	77	Liberalized
Lesotho	40	Minimally developed	52	Somewhat developed	7	Undeveloped	26	Minimally developed	20	Repressed	52	Somewhat liberalized
Madagascar	57	Somewhat developed	68	Somewhat developed	23	Undeveloped	52	Somewhat developed	20	Repressed	61	Somewhat liberalized
Mali	43	Minimally developed	58	Somewhat developed	26	Minimally developed	39	Minimally developed	20	Repressed	68	Somewhat liberalized
Mozambique	89	Somewhat developed	82	Largely developed	11	Undeveloped	49	Minimally developed	0	Repressed	63	Somewhat liberalized
Mauritius	61	Somewhat developed	76	Largely developed	16	Undeveloped	69	Somewhat developed	60	Somewhat liberalized	86	Liberalized
Malawi	56	Somewhat developed	62	Somewhat developed	6	Undeveloped	56	Somewhat developed	20	Repressed	43	Minimally liberalized
Namibia	75	Largely developed	88	Largely developed	16	Undeveloped	70	Somewhat developed	20	Repressed	71	Somewhat liberalized
Niger	58	Somewhat developed	73	Somewhat developed	22	Undeveloped	35	Minimally developed	20	Repressed	67	Somewhat liberalized
Nigeria	67	Somewhat developed	82	Largely developed	17	Undeveloped	54	Somewhat developed	20	Repressed	40	Minimally liberalized
Senegal	47	Minimally developed	62	Somewhat developed	25	Minimally developed	42	Minimally developed	20	Repressed	70	Somewhat liberalized
São Tomé e Príncipe	23	Undeveloped	38	Minimally developed	5	Undeveloped	14	Undeveloped	20	Repressed	40	Minimally liberalized
Swaziland	62	Somewhat developed	63	Somewhat developed	19	Undeveloped	62	Somewhat developed	40	Minimally liberalized	63	Somewhat liberalized
Togo	54	Somewhat developed	70	Somewhat developed	11	Undeveloped	32	Minimally developed	20	Repressed	68	Somewhat liberalized
Tanzania	49	Minimally developed	56	Somewhat developed	5	Undeveloped	56	Somewhat developed	20	Repressed	68	Somewhat liberalized
Uganda	59	Somewhat developed	71	Somewhat developed	8	Undeveloped	41	Minimally developed	20	Repressed	67	Somewhat liberalized
South Africa	93	Largely developed	93	Largely developed	75	Largely developed	100	Largely developed	60	Somewhat liberalized	93	Liberalized
Zambia	67	Somewhat developed	68	Somewhat developed	11	Undeveloped	45	Minimally developed	20	Repressed	67	Somewhat liberalized
Zimbabwe	69	Somewhat developed	73	Somewhat developed	26	Minimally developed	64	Somewhat developed	20	Repressed	57	Somewhat liberalized
Average	54	Somewhat developed	63	Somewhat developed	13	Undeveloped	38	Minimally developed	21	Repressed	55	Somewhat liberalized

Sources: IMF; and data provided by country authorities.

^{1/} See section IV for description of indices and categories corresponding to the four quartiles.

Box 1. Market Structure Index

- bank concentration ratio (Herfindahl index¹ applied to the five largest banks);
- minimum risk-based capital adequacy requirement;
- share of private banks' in total loans and deposits;
- spread between lending and deposit rates²;
- share of nonperforming loans in commercial banks' portfolio; and
- existence of financial institutions other than commercial banks.

1/ The Herfindahl index was computed as $H_i = \sum_{j=1, \dots, 5} (S_j / \sum_{j=1, \dots, 5} S_j)^2$, where S_j is the sum of deposits and loans for bank j . As defined, the index equals one in the case of a monopoly and 0.2 in the case of equal shares.

2/ In constructing the index, the value assigned to the interest rate spread is contingent on whether interest rates were liberalized. If interest rates were not liberalized, the country was automatically assigned the highest spread within the sample.

Concentration was judged by estimating the Herfindahl index of concentration. By 1997, only eight countries had relatively low indices (less than 0.25), which characterize evenly distributed banking systems¹¹, while about one-half of the countries were characterized by highly concentrated banking systems. Regarding bank ownership, the banking system was almost totally private (that is, the top 5 banks had majority private shareholding) in 13 countries (Benin, Burkina Faso, Botswana, Comoros, Guinea, Guinea-Bissau, Malawi, Mauritius, Mozambique, Namibia, Nigeria, Senegal, and South Africa). However, state-owned banks still played a predominant role in 10 countries (Angola, Cape Verde, Central African Republic, Equatorial Guinea, Eritrea, Ethiopia, Lesotho, Mali, Republic of Congo, and Tanzania) for which the share of private banks in total loans and deposits was equal to or less than 30 percent.

In 1997, interest rate spreads remained large in a majority of sub-Saharan African countries. At mid-1997, only 5 countries (Botswana, Gabon, Niger, South Africa, and Togo) had interest spreads below 6 percent, and no country had spreads below 4 percent. In another 13 countries, the spread was between 6 percent and 10 percent. The large spreads appear to be directly related to the degree of bank concentration, the share of nonperforming loans, and the lack of openness of the financial system.

In 1997, the average share of nonperforming loans in the portfolio of sub-Saharan African countries' banking systems was more than 20 percent. This poses a risk to the stability of the system, contributes to high lending rates, and hampers the development of interbank financial

¹¹Cameroon, Kenya, Madagascar, Mali, Nigeria, Senegal, Swaziland, and Zimbabwe.

markets. Only 6 countries in the sample had a share of nonperforming loans lower than 6 percent (Benin, Botswana, Burkina Faso, Namibia, South Africa, and Togo).¹²

B. Financial Products

The financial products index indicates the availability of financial products to the public (Box 2). This index shows that in 1997 most countries still had a very limited array of financial products (Table 2), and that only South Africa could be considered to be developed in this area.

In 1997, most countries did not pay interest on demand deposits (24 out of 38 countries) and only a few had time deposits with maturities of more than 24 months (9 countries). Lending operations also tended to be concentrated at the short end of the term structure, with only 17 countries having term lending in excess of 24 months. The fact that the term structure of loans is almost always longer than the term structure of deposits suggests that commercial banks in some countries engage in substantial maturity transformation and may therefore be vulnerable to fluctuations in interest rates.

Government securities also tended to be limited to short maturities in 1997, and only 15 countries had securities with maturities exceeding one year. In 22 out of 38 countries, the nonfinancial private sector held government securities in 1997. Stock exchanges were relatively rare and underdeveloped. In terms of capitalization, South Africa's stock market was at least 200 times larger than any other in the region. Ten other countries had stock exchanges, but in many of them trading was limited to a few stocks. Credit cards were issued in only 15 countries in 1997.

Box 2. Financial Products Index

- Is interest paid on demand deposits?
- Does the nonfinancial private sector hold government securities?
- Are there government securities with more than one year maturity?
- What is the maximum maturity of time deposits?
- What is the maximum maturity of bank lending operations?
- Is there a stock exchange?
- Do banks issue debit/credit cards?
- Are there interbank transactions in (a) foreign exchange, (b) loans, (c) bank certificates of deposit or acceptances, (d) commercial paper, or (e) government securities?

¹²In Togo, the ratio of nonperforming loans to the total loan portfolio fell from 17 percent in 1994 to 5.4 percent in 1998. However, a large part of this decline was due to a rescheduling of loans. There is also a concern that individual banks may not classify their loans properly.

Interbank markets were still undeveloped in most countries in 1997. While interbank loans were relatively common (27 of 38 countries), interbank transactions in bank certificates of deposit or acceptances were rare (Central African Republic, Namibia, Nigeria, South Africa, and Zimbabwe). Interbank transactions in foreign exchange were conducted in only 18 countries, and interbank transactions in government securities in just 14 countries. Commercial paper was used in interbank transactions in only 9 countries (Benin, Botswana, Central African Republic, Malawi, Nigeria, South Africa, Swaziland, Togo, and Zimbabwe). Eight countries had no interbank transactions at all in 1997.¹³

C. Financial Liberalization

The financial liberalization index measures the absence of financial repression by taking into account whether credit controls are used and whether interest rates are market determined and positive in real terms (Box 3). This is an area in which considerable progress was achieved during the 1987–97 period (Table 2).

While in 1987 33 countries had financial systems that were highly repressed—that is, with the financial liberalization index in the first quartile—the survey reveals that, by 1997, most countries had taken steps to liberalize their financial systems, and only 4 countries remained in that category. However, 8 countries—Angola, Central African Republic, Cameroon, Cape Verde, Comoros, Eritrea, Ethiopia and Guinea Bissau—still maintained significant interest rate and selective credit controls, and one country—Nigeria—had real lending rates that were negative in real terms.¹⁴ The 5 most liberalized countries in the region were South Africa, Mauritius, Kenya, Burkina Faso, and Namibia.

Box 3. Financial Liberalization Index

- Are interest rates liberalized?
- How many years have real lending interest rates been positive?
- How many years have real deposit rates been positive?
- Is an informal financial sector significant?
- Are selective credit controls (i.e., credit or interest rate policies that favor specific sectors) absent?

¹³In calculating the financial products index, a country's score in the category of interbank transactions was derived as follows. An average was computed for up to three areas in which the country had interbank transactions. Therefore, a country was assigned a score of 100 on this question if it had interbank transactions in at least three of the five areas.

¹⁴Interestingly, Nigeria is not reported as having had interest rate controls.

D. Institutional Environment

The institutional environment is now regarded as an important factor affecting the development of the financial sector and economic performance. The institutional environment index measures the presence of supporting institutional features, like property rights and the adequacy of the judicial system (Box 4). The survey shows that the number of countries in which the institutional environment could be considered supportive (somewhat or largely supportive) rose from 8 in 1987 to 23 in 1997 (Figure 5 and Table 3). The remaining 15 countries would benefit from improvements in the transfer of ownership, judicial loan recovery, and commercial legislation.

Box 4. Institutional Environment Index

- Most land is privately owned.
- Most buildings are privately owned.
- It is easy to transfer ownership of land or real estate.
- Land and property registries are considered adequate.
- It is generally easy for creditors to recover debts through the judicial system.
- Commercial legislation is considered adequate.
- There is a law on the use of checks.

In 1997, land was mostly state owned in 14 countries and was therefore generally unavailable to serve as collateral for financial transactions. Buildings, however, were generally privately held in all the countries except Equatorial Guinea, Ethiopia, and Swaziland. It was difficult to transfer ownership of land and real estate in 18 of the 38 countries in the sample. Loan recovery through the judicial system was deemed to be difficult in 75 percent of the countries (28 countries), and commercial legislation inadequate in half of the countries. Legislation on the use of checks was absent in 11 countries.

E. Financial Openness

The financial openness index combines features that reveal the degree of openness of the financial system and its integration with world capital markets (Box 5). The results in Table 3 show that in 1987 only 12 countries had a reasonable level of financial openness (somewhat or largely open), of which 2 countries were largely open (Mauritius and Kenya). By 1997, 30 countries had reached a reasonable level of financial openness. Only Angola and Ethiopia displayed an almost complete lack of integration with international markets and 10 additional countries had become largely open. The 4 countries with the best ratings in this area in 1997 were Kenya, Mauritius, Guinea-Bissau, and Uganda.

Most sub-Saharan African countries have now accepted the obligations of Article VIII, Sections 2, 3, and 4 of the IMF's Articles of Agreement.¹⁵ In 1997, countries still claiming Article XIV¹⁶ status comprised Angola, Democratic Republic of Congo, Cape Verde, Eritrea, Ethiopia, Lesotho, Mozambique, Nigeria, São Tomé and Príncipe, and Zambia. Multiple exchange practices had been eliminated in most countries, remaining only in Botswana, Nigeria, São Tomé and Príncipe, and Zambia. Controls on external interest payments existed in 18 countries.

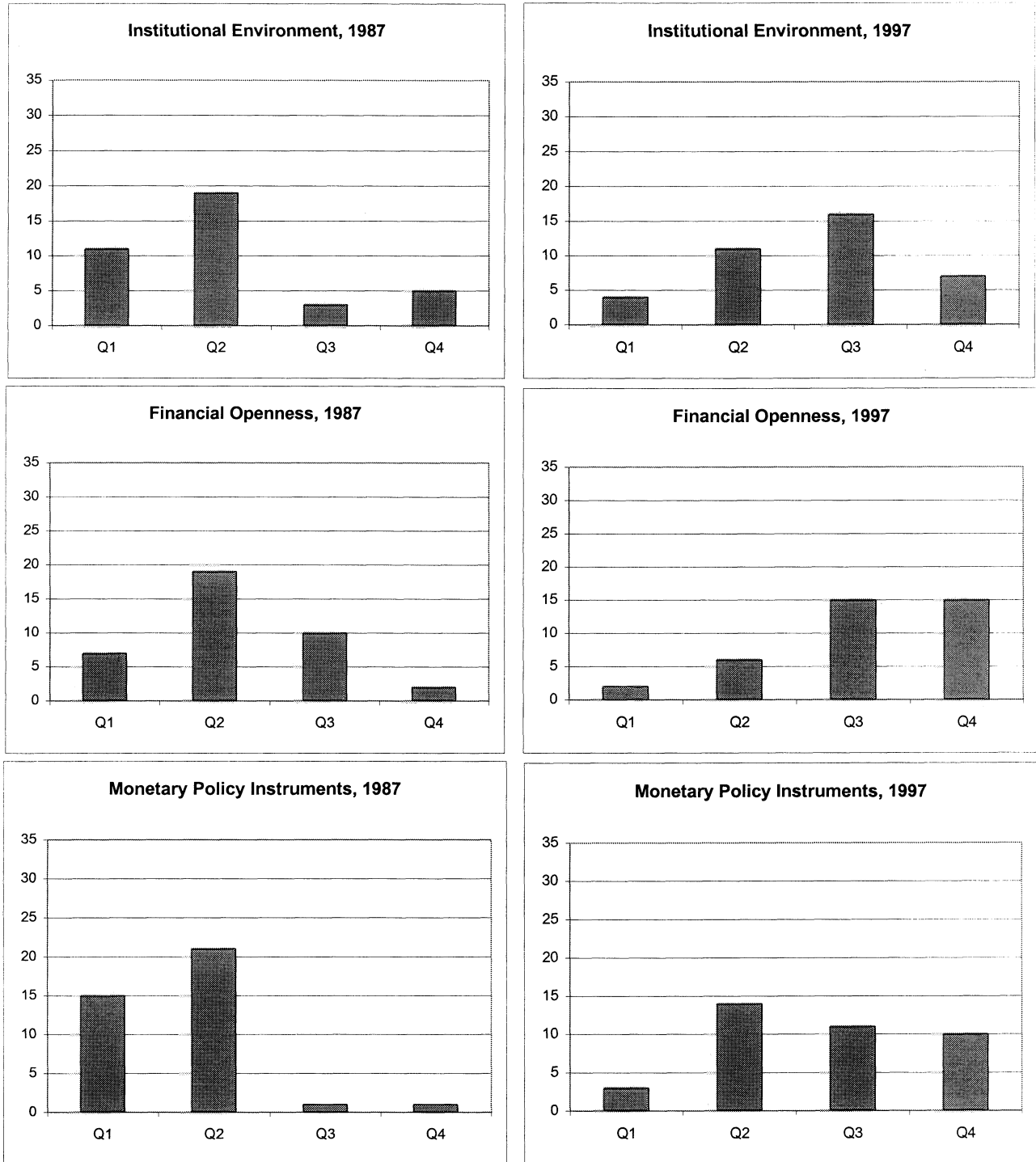
Box 5. Financial Openness Index

- Are there significant restrictions to the purchase of domestic financial assets by nonresidents?
- Are there significant restrictions to the purchase of foreign exchange by residents?
- Is there a parallel market for foreign exchange?
- If a parallel market for foreign exchange exists, is the exchange differential vis-à-vis the official rate is normally lower than 10 percent?
- Are there no significant restrictions on the purchase of foreign financial assets by residents?
- Has the country accepted the obligations under Article VIII, Sections 2, 3, and 4 of the IMF articles of agreement?
- Is there a multiple exchange rate system?
- Is there a forward exchange market?
- Is there an exchange tax?
- Are there controls on interest payments?
- Are there controls on profits/dividend payments?
- Are there repatriation requirements for service earnings?
- Are there controls on liquidation of direct investment?

¹⁵The acceptance of the obligations of Article VIII signals a commitment by the member country to avoid imposing restrictions on payments and transfers for current transactions and adopting discriminatory currency arrangements and/or multiple currency practices related to current transactions.

¹⁶A country that joins the Fund without accepting the obligations of Article VIII avails itself of the transitional arrangements of Article XIV. These arrangements allow a Fund member to maintain or adapt those restrictions to current transactions that were in effect at the time it became a member. The country is expected to eliminate those restrictions as soon as possible, and the introduction of new restrictions is not allowed.

Figure 5. Sub-Saharan Africa: Financial Development Indicators, 1987-97^{1/}
(Number of countries in each quartile)



1/ See section IV for a description of categories corresponding to the four quartiles.

Table 3. Sub-Saharan Africa: Financial Development Indicators, 1987-97^{1/}

Country	Institutional Environment				Financial Openness				Monetary Policy Instruments			
	1987		1997		1987		1997		1987		1997	
	Index	Quartile	Index	Quartile	Index	Quartile	Index	Quartile	Index	Quartile	Index	Quartile
Angola	0	Unsupportive	29	Minimally supportive	15	Closed	23	Closed	0	Undeveloped	0	Undeveloped
Benin	14	Unsupportive	71	Somewhat supportive	38	Minimally open	77	Largely open	29	Minimally developed	43	Minimally developed
Burkina Faso	43	Minimally supportive	71	Somewhat supportive	38	Minimally open	69	Somewhat open	29	Minimally developed	71	Somewhat developed
Botswana	71	Somewhat supportiv	71	Somewhat supportive	54	Somewhat open	46	Minimally open	29	Minimally developed	71	Somewhat developed
Central African Rep.	43	Minimally supportive	71	Somewhat supportive	31	Minimally open	46	Minimally open	43	Minimally developed	86	Largely developed
Côte d'Ivoire	29	Minimally supportive	43	Minimally supportive	54	Somewhat open	85	Largely open	43	Minimally developed	43	Minimally developed
Cameroon	43	Minimally supportive	57	Somewhat supportive	15	Closed	46	Minimally open	29	Minimally developed	86	Largely developed
Dem. Rep. of Congo	43	Minimally supportive	71	Somewhat supportive	23	Closed	46	Minimally open	14	Undeveloped	14	Undeveloped
Replubic of Congo	14	Unsupportive	71	Somewhat supportive	31	Minimally open	62	Somewhat open	29	Minimally developed	86	Largely developed
Comoros	29	Minimally supportive	29	Minimally supportive	38	Minimally open	62	Somewhat open	29	Minimally developed	29	Minimally developed
Cape Verde	71	Somewhat supportiv	71	Somewhat supportive	38	Minimally open	62	Somewhat open	29	Minimally developed	43	Minimally developed
Eritrea	29	Minimally supportive	14	Unsupportive	31	Minimally open	54	Somewhat open	14	Undeveloped	29	Minimally developed
Ethiopia	14	Unsupportive	14	Unsupportive	15	Closed	23	Closed	0	Undeveloped	29	Minimally developed
Gabon	43	Minimally supportive	100	Largely supportive	54	Somewhat open	77	Largely open	29	Minimally developed	86	Largely developed
Ghana	14	Unsupportive	86	Largely supportive	38	Minimally open	85	Largely open	29	Minimally developed	71	Somewhat developed
Guinea	29	Minimally supportive	43	Minimally supportive	31	Minimally open	54	Somewhat open	29	Minimally developed	71	Somewhat developed
The Gambia	57	Somewhat supportiv	71	Somewhat supportive	62	Somewhat open	85	Largely open	29	Minimally developed	43	Minimally developed
Guinea-Bissau	14	Unsupportive	43	Minimally supportive	54	Somewhat open	92	Largely open	29	Minimally developed	29	Minimally developed
Equatorial Guinea	14	Unsupportive	43	Minimally supportive	31	Minimally open	62	Somewhat open	43	Minimally developed	86	Largely developed
Kenya	29	Minimally supportive	71	Somewhat supportive	77	Largely open	100	Largely open	43	Minimally developed	71	Somewhat developed
Lesotho	14	Unsupportive	57	Somewhat supportive	23	Closed	46	Minimally open	14	Undeveloped	50	Somewhat developed
Madagascar	43	Minimally supportive	57	Somewhat supportive	54	Somewhat open	69	Somewhat open	14	Undeveloped	71	Somewhat developed
Mali	29	Minimally supportive	57	Somewhat supportive	31	Minimally open	77	Largely open	29	Minimally developed	57	Somewhat developed
Mozambique	0	Unsupportive	29	Minimally supportive	38	Minimally open	62	Somewhat open	14	Undeveloped	43	Minimally developed
Mauritius	86	Largely supportive	100	Largely supportive	92	Largely open	100	Largely open	29	Minimally developed	71	Somewhat developed
Malawi	29	Minimally supportive	43	Minimally supportive	31	Minimally open	46	Minimally open	0	Undeveloped	43	Minimally developed
Namibia	86	Largely supportive	100	Largely supportive	38	Minimally open	69	Somewhat open	14	Undeveloped	43	Minimally developed
Niger	29	Minimally supportive	57	Somewhat supportive	54	Somewhat open	85	Largely open	29	Minimally developed	43	Minimally developed
Nigeria	29	Minimally supportive	86	Largely supportive	23	Closed	54	Somewhat open	14	Undeveloped	57	Somewhat developed
Senegal	43	Minimally supportive	71	Somewhat supportive	31	Minimally open	62	Somewhat open	29	Minimally developed	43	Minimally developed
São Tomé and Prncip	29	Minimally supportive	29	Minimally supportive	38	Minimally open	54	Somewhat open	0	Undeveloped	0	Undeveloped
Swaziland	0	Unsupportive	0	Unsupportive	62	Somewhat open	77	Largely open	57	Somewhat develope	86	Largely developed
Togo	14	Unsupportive	14	Unsupportive	46	Minimally open	77	Largely open	14	Undeveloped	29	Minimally developed
Tanzania	29	Minimally supportive	29	Minimally supportive	46	Minimally open	85	Largely open	14	Undeveloped	86	Largely developed
Uganda	29	Minimally supportive	29	Minimally supportive	46	Minimally open	92	Largely open	43	Minimally developed	71	Somewhat developed
South Africa	86	Largely supportive	100	Largely supportive	62	Somewhat open	62	Somewhat open	100	Largely developed	100	Largely developed
Zambia	86	Largely supportive	86	Largely supportive	62	Somewhat open	85	Largely open	14	Undeveloped	100	Largely developed
Zimbabwe	86	Largely supportive	57	Somewhat supportive	23	Closed	62	Somewhat open	14	Undeveloped	86	Largely developed
Average	36	Minimally supportive	56	Somewhat supportive	41	Minimally open	66	Somewhat open	26	Minimally developed	57	Somewhat developed

Sources: IMF; and data provided by country authorities.

1/ See section IV for description of indices and categories corresponding to the four quartiles.

There were no significant restrictions on the purchase of domestic financial instruments by nonresidents in 31 countries, no significant restrictions on the purchase of foreign exchange by residents in 28 countries, and no significant restrictions on the purchase of foreign financial assets in 21 countries. These results show that, while restrictions to capital inflows are not significant in most countries, restrictions to capital outflows are more common.

The survey also reveals that in 1997 a parallel market in foreign exchange existed in 13 countries, implying that some transactions were restricted either explicitly or implicitly in the official exchange markets. Furthermore, only 3 countries had exchange rate taxes, and 3 countries (Angola, Central African Republic, and Nigeria) had differentials between the official and the parallel market exchange rates in excess of 10 percent. Forward exchange markets were available in 23 of the 38 countries surveyed.

Controls on remittances of profits and dividends remained widespread in 1997, being present in 20 countries. Repatriation requirements for services earnings were present in 27 countries, and controls on the liquidation of foreign direct investment were in place in 22 countries.

F. Monetary Policy Instruments

Another important aspect of financial development is the availability and sophistication of the monetary policy instruments used by the authorities. The monetary policy instruments index contains information about the nature of the available instruments (Box 6). The results of the survey show significant progress in this area during 1987-97 (Table 3). In 1987, only South Africa had largely developed monetary policy instruments, while 15 countries had very rudimentary instruments. By 1997, 10 countries had largely developed monetary policy instruments (South Africa, Zambia, Central Africa Republic, Cameroon, Republic of Congo, Gabon, Equatorial Guinea, Swaziland, Tanzania, and Zimbabwe). However, 14 countries were classified as having "minimally developed" monetary policy instruments, and 3 countries (Angola, Democratic Republic of Congo, and São Tomé and Príncipe) had only rudimentary instruments of monetary control.

The survey indicates that by 1997 bank-by-bank credit limits had been abandoned in all but 7 countries of the region. Open market operations were conducted in 19 countries. However, only 10 countries had large-value payment systems to ensure rapid and secure payments in connection with interbank transactions, and reserve requirements were based on contemporaneous values for deposits in less than half of the countries (16 countries). The government obtained resources through market operations in 20 countries, the central bank rediscount rate was used as an active monetary policy instrument in 25 countries, and central bank advances to commercial banks were used as an instrument of monetary policy in 30 countries.

Box 6. Monetary Policy Instruments Index

- The monetary authorities do not impose bank-by-bank credit limits.
- The central bank discount rate is used as an active monetary policy instrument.
- Central bank loans to banks are primarily used as a monetary policy instrument (instead of as a way of refinancing to clients).
- There is a large-value payment system (i.e., a system for rapid clearing of large payment orders).
- The base used to calculate reserve requirements is computed from contemporaneous values.
- The government obtains resources through market operations, such as auctions.
- The central bank conducts open market operations.
- The public holds government securities.

VI. REGRESSION ANALYSIS

This section tests whether the indices reported in Section V are able to explain cross-country changes in real per capita growth in the region. The analysis is based on the growth model proposed by Mankiw, Romer, and Weil (1992) and applied by Ghura and Hadjimichael (1996) to African countries. It assumes a Cobb-Douglas production function with physical and human capital augmenting technology and a vector of variables that are reported as having an effect on the rate of technological progress. The empirical model is specified as

$$YGDP = f(Y_0, POPGR, IGDP, HC, FD), \quad (3)$$

where $YGDP$ is the annual rate of growth in per capita GDP between 1987 and 1997, Y_0 is initial income measured as the 1987 level of GDP in U.S. dollars, $POPGR$ is the rate of population growth between 1987 and 1997, $IGDP$ is the average of the investment-to-GDP ratio during 1987-90, HC is an indicator of human capital, and FD is a measure of financial development.

The sources of the data are the World Economic Outlook database, the *International Financial Statistics* database, the United Nations *World Development Report*, and the indices reported in Section V above. The regression results, estimated by ordinary least squares, are reported in Table 4 below.

Regression 1 uses the 1987 index ($FD87$) as a measure of the state of financial development in that year. As in other studies of the determinants of economic growth, the hypothesis of unconditional convergence is rejected (i.e., countries with a smaller GDP at the beginning of the period grow at a faster rate than countries with a large initial GDP). All coefficients except HC have the expected sign, and $IGDP$ and $FD87$ are statistically significant at the

1 percent and 10 percent confidence levels, respectively.¹⁷ The significance of *FD87* in the equation is in line with the findings of King and Levine (1993a), which show that the initial level of financial development is an important predictor of future economic growth. Regression 2 uses instead the change in the financial development index between 1987 and 1997 (*FD87-97*), but its coefficient turns out not to be statistically significant. However, when using both *FD87-97* and *FD87* in the estimation (regression 3), both coefficients turn out significant at the 5 percent and 1 percent confidence levels, respectively.

We now expand equation 3 to test which one of the changing features of the financial system has a stronger impact on growth. The best equation, shown as regression 4, suggests that the most important variables are financial liberalization (*FL87-97*), changes in the institutional environment (*IE87-97*), and changes in the array of financial products (*FP87-97*).¹⁸

¹⁷None of the variables used to measure human capital (the human development index, combined primary and secondary education enrollment ratio, or literacy rate) are statistically significant.

¹⁸White's heteroscedasticity test was performed in all regressions, and the *F*-statistic and its significance is also shown in Table 4. The results suggest the presence of homoscedastic errors in equations 3 and 4, though heteroscedasticity may be a problem in the first two equations.

Table 4. Estimates of the Growth Equation 1/

Explanatory Variable	Regressions			
	1	2	3	4
Constant	-1.849 (-0.57)	-1.379 (-0.39)	-5.786 (-1.59)*	-6.236 (-1.81)**
Y0	-0.044 (-1.28)	-0.011 (-0.36)	-0.050 (-1.54)*	-0.047 (-1.50)*
IGDP	0.140 (3.00)***	0.111 (2.26)**	0.128 (2.81)**	0.138 (3.15)***
HC	-0.137 (-0.38)	2.361 (0.73)	-2.058 (-0.60)	-1.961 (-0.59)
POPGR	-0.980 (-1.16)	-0.930 (-1.06)	-1.090 (-1.36)*	-1.095 (-1.39)*
FD87	0.076 (1.68)*		0.138 (2.63)***	0.130 (2.87)***
FD87-97		0.136 (0.65)	0.482 (2.08)**	
FP87-97				0.070 (1.57)*
FL87-97				0.178 (2.06)**
IE87-97				0.104 (1.80)**
R-square	0.377	0.330	0.456	0.530
F 2/	3.755**	3.054**	4.189**	3.952**
Degrees of freedom	5, 31	5, 31	6, 30	8, 28
Heteroscedasticity test 3/	1.125	1.328	0.353*	0.428*
Degrees of freedom	20, 10	20, 10	27, 2	10, 23

1/ The numbers in parentheses below the estimated coefficients are the corresponding *t*-statistics.

One, two and three asterisks denote statistical significance at the 10 percent, 5 percent and 1 percent levels, respectively.

2/ The *F*-statistic tests for the null hypothesis that the joint effect of all explanatory variables in the estimated equation is zero.

3/ *F*-test for the null hypothesis of homoscedasticity.

VII. CONCLUSIONS

Recent literature on finance and growth suggests that financial systems arise to facilitate exchange, manage risk, identify good projects, monitor managers, and mobilize savings. In principle, an assessment of financial development should evaluate the extent to which these functions of a financial sector are realized in practice. While the indices developed here cannot be uniquely linked to the concepts mentioned above, they do provide a richer analysis of the concept of financial development than what has been used so far in the literature.

The paper analyzed financial development in sub-Saharan Africa from six angles: the structure of the market, the availability of financial products, the stage of financial liberalization, the institutional environment under which the financial system operates, the degree of integration with foreign financial markets, and the sophistication of available monetary policy instruments. The results from the survey confirmed that progress has been achieved in improving and modernizing the financial systems of most sub-Saharan African countries since the mid-1980s. However, much remains to be done, and most countries could benefit from further initiatives aimed at completing the reform process and increasing the ability of the system to meet the financial needs of the economy in the next decade.

The quality and competitiveness of the institutions that comprise the financial sector have improved in most countries. However, the lack of development of financial products and markets is noteworthy. Most countries have a very limited array of financial products, and only 4 countries could be considered somewhat developed in this area. Even though most countries have taken steps to liberalize their financial systems, 14 countries still display some degree of financial repression. The survey also found that only about half of the countries have a broad range of indirect monetary policy instruments at their disposal, uncovering the need for further efforts in this area as well.

The institutional environment could be considered supportive in more than half of the countries reviewed, while further measures are still needed in the remainder to improve judicial loan recovery, property transfers, and commercial legislation. Regarding financial openness, most countries appear to have achieved a reasonable degree of openness, although the prevalence of controls on the repatriation of profits, services earnings, and proceeds from foreign investment is noteworthy. These restrictions are probably another factor constraining direct foreign investment in these countries in the 1990s, and a reminder of the need for a more comprehensive approach to the development of the financial sector (i.e., institutional environment) and more favorable conditions for trade and investment in general.

Lastly, we tested the significance of the index of financial development for economic growth in the region. In line with previous studies linking financial development to growth, the results suggest that both the level and the change in financial development have an effect on per capita GDP growth.

References

- Agarwala, Ramgopal, 1983, "Price Distortions and Growth in Developing Countries," World Bank Staff Working Paper No. 575 (Washington: World Bank).
- Barro, Robert, 1991, "Economic Growth in a Cross-Section of Countries," *Quarterly Journal of Economics*, Vol. 106 (May), pp. 407-33.
- Fry, Maxwell, 1978, "Money or Capital or Financial Deepening in Economic Development?" *Journal of Money, Credit and Banking*, Vol. 10 (November), pp. 464-75.
- _____, 1988, *Money, Interest, and Banking in Economic Development*, (Baltimore, Maryland: Johns Hopkins University Press).
- Gelb, Alan H., 1989, "A Cross-Section Analysis of Financial Policies, Efficiency and Growth," World Bank Policy, Planning, and Research Working Paper WPS 202 (Washington: World Bank).
- Ghura, Dhaneshwar, and Michael Hadjimichael, 1996, "Growth in Sub-Saharan Africa," *Staff Papers*, International Monetary Fund, Vol. 43 (September), pp. 605-34.
- Goldsmith, Raymond, 1969, *Financial Structure and Development* (New Haven, Connecticut: Yale University Press).
- Harris, James W., 1979, "Financial Deepening as a Prerequisite to Investment Growth: Empirical Evidence from Five East Asian Economies," *Developing Economies*, Vol. 17 (September), pp. 295-308.
- Johnston, R. Barry, and Ceyla Pazarbasioglu, 1995, "Linkages Between Financial Variables, Financial Sector Reform and Economic Growth and Efficiency," IMF Working Paper 95/103 (Washington: International Monetary Fund).
- Khatkhate, Deena, 1988, "Assessing the Impact of Interest Rates in Less Developed Countries," *World Development*, Vol. 16 (May), pp. 577-88.
- King, Robert, and Ross Levine, 1993a, "Financial Intermediation and Economic Development," in *Financial Intermediation in the Construction of Europe*, ed. by Colin Mayer and Xavier Vives, (London: Centre for Economic Policy Research), pp. 156-89.
- _____, 1993b, "Finance and Growth: Schumpeter Might Be Right," *Quarterly Journal of Economics*, Vol. 108 (August), pp. 717-37.

- Lanyi, Anthony, and Rusdu Saracoglu, 1983, *Interest Rate Policies in Developing Countries: A Study*, IMF Occasional Paper No. 22 (Washington: International Monetary Fund).
- La Porta, Rafael, and others, 1997, "Legal Determinants of External Finance," *Journal of Finance*, Vol. 52 (July), pp. 1131-50.
- Levine, Ross, 1997, "Financial Development and Economic Growth: Views and Agenda," *Journal of Economic Literature*, Vol. 35 (June), pp. 688-726.
- _____, and Sara Zervos, 1998, "Stock Markets, Banks, and Economic Growth," *American Economic Review*, Vol. 88 (June), pp. 537-58.
- McKinnon, Ronald, 1973, *Money and Capital in Economic Development* (Washington: Brookings Institution).
- _____, 1982, "The Order of Economic Liberalization: Lessons From Chile and Argentina," *Carnegie-Rochester Series on Public Policy*, Vol. 17 (Autumn), pp. 159-86.
- _____, 1993, *The Order of Economic Liberalization: Financial Control in the Transition to a Market Economy*, (Baltimore, Maryland: Johns Hopkins University Press, 2nd ed.).
- Mehran, Hassanali, and others, 1998, *Financial Sector Development in Sub-Saharan African Countries*, IMF Occasional Paper No. 169 (Washington: International Monetary Fund).
- Patrick, Hugh, 1966, "Financial Development and Economic Growth in Underdeveloped Countries," *Economic Development and Cultural Change*, Vol. 14 (January), pp. 174-89.
- Pill, Huw, and Mahmood Pradhan, 1995, "Financial Indicators and Financial Change in Africa and Asia," IMF Working Paper 95/123 (Washington: International Monetary Fund).
- Robinson, Joan, 1952, "The Generalization of the General Theory," in *The Rate of Interest, and Other Essays* (London: Macmillan), pp. 67-142.
- Rother, Philipp C., 1999, "Explaining the Behavior of Financial Intermediation: Evidence from Transition Economies," IMF Working Papers 99/36 (Washington: International Monetary Fund).
- Shaw, Edward, 1973, *Financial Deepening in Economic Development* (New York: Oxford University Press).