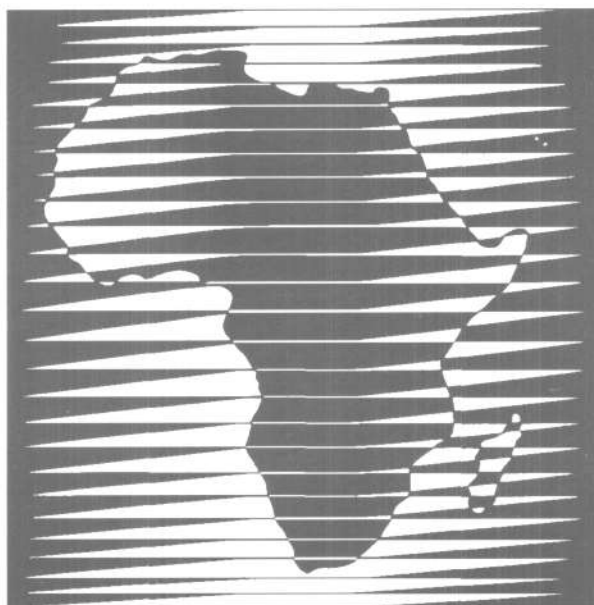


AFRICAN REVIEW OF MONEY FINANCE AND BANKING



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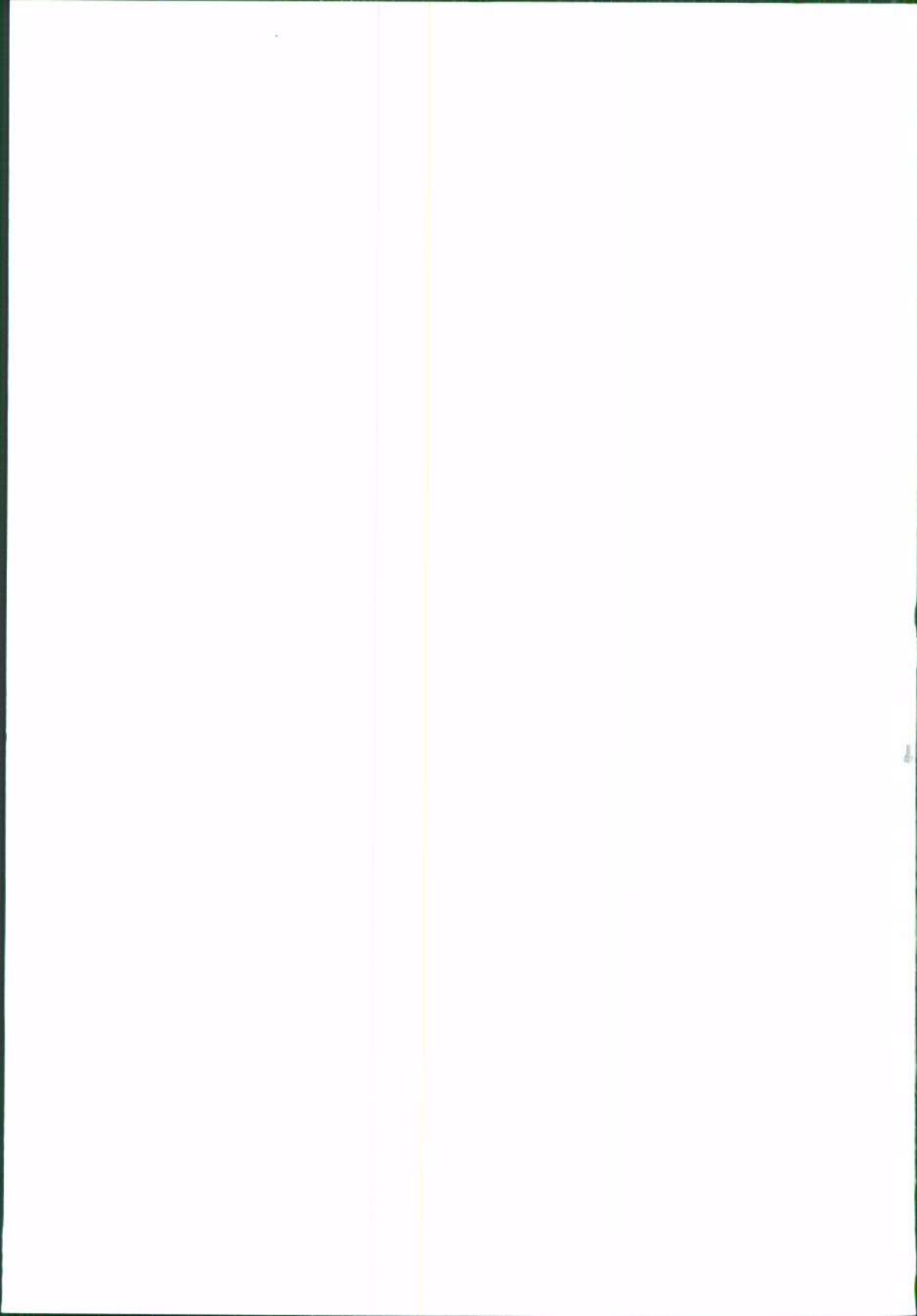
Centre for Assistance to Financial and Credit Institutions of Transitional Countries

Established by



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Supplementary issue of "Savings and Development"
1-2/1996



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SUPERVISION, CAPITAL ADEQUACY AND BANKING DEVELOPMENT: SOME EVIDENCE FROM ZIMBABWE¹

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E.P.M. Gardener, University of Wales

1. The Banking and Financial System in Zimbabwe

Zimbabwe is generally categorised on the international level as a small, lower-middle income country. GDP at factor cost was \$9000 million at the end of 1987; per capita GDP was around \$1000. Zimbabwe has a broadly based economy with production largely carried out by the private sector. It has a relatively sophisticated and well-developed economic system, which is predominantly owned by the private sector and in which there is a relatively high level of foreign control. Nevertheless, most of the characteristics of underdevelopment exist in Zimbabwe. The country remains a dual economy with a rural sector depending on peasant agriculture. Political independence from British rule was gained on 18 April 1980.

Considering the size of its real economy, Zimbabwe's financial system is comparatively sophisticated and comprises a wide range of banking institutions, insurance companies, development institutions, a stock exchange and trust companies. The main financial institutions provide a wide and expanding array of financial services within the domestic economy. The Reserve Bank of Zimbabwe is at the apex of the financial system and performs the usual central bank functions. The role of the Reserve Bank has increased in importance since Zimbabwe gained its independence in 1980 and subsequently joined organisations like the IMF, the African Development Bank and the PTA (Preferential Trade Area).

Table 1 provides some summary data on the development of the banking system in Zimbabwe during the time spanned by this study. Although there was virtually no change in the numbers of the different institutions, the total balance sheet growth of the banking sector was impressive. Between 1979 and 1987, the size of the banking sector's balance sheet practically tripled; the growth of the commercial banks, finance houses and Post Office Savings Bank (POSB) was especially strong. Whilst the commercial banks, finance houses and POSB gained market share (in terms of their share of the total banking sector balance sheet), the accepting houses, discount houses and building societies lost market share during this period.

1. The views expressed in this paper are those of the author in her personal capacity and not as an officer of the Reserve Bank of Zimbabwe.

Table 1: Development of the Zimbabwe Banking System

Institutions	Balance sheet total			Z\$Million			No. of Institutions		
	Percentages								
	1979	1983	1987	1979	1983	1987	1979	1983	1987
Commercial banks	38.3	45.9	44.9	764.2	1508.7	2623.7	4	5	5
Accepting Houses	12.8	9.3	8.7	255.2	305.2	508.5	4	4	4
Discount Houses	4.1	4.0	3.3	82.2	131.1	194.1	2	2	2
Finance Houses	5.4	6.2	6.6	107.5	202.1	386.3	5	5	5
POSB (Post Office Savings Bank)	13.0	14.7	20.8	260.1	481.6	1213.1	1	1	1
Building Societies	26.4	19.9	15.7	526.3	652.0	913.9	3	3	3
Total	100	100	100	1995.5	3280.7	5839.6	19	20	20

Sources: Reserve Bank of Zimbabwe *Quarterly Economics and Statistical Review*, June-September 1995.

The commercial banking sector is the largest financial sub-sector, and all of the banks in Zimbabwe are international in character. Commercial bank assets comprised 44.9% of the total banking sector assets as at 1987. Assets grew at an annual average rate of 13.5 per cent from 1975 to 1987. Banking growth accelerated sharply between 1979 and 1983.

Accepting houses (merchant banks) were first established in Zimbabwe (then Rhodesia) after the establishment of the Reserve Bank in 1956. In 1987 the four merchant banks' assets constituted 8.7 per cent of the total assets of the banking sector. Although acceptances are their main line of business, the merchant banks have taken a large amount of deposits (58.4 per cent of their total liabilities in 1987) and they have also diversified their overall business mix.

The discount houses act as intermediaries between the Reserve Bank and the financial sector, and they are also involved in the investment field. They accept call money from banking and other institutions, which they invest in Government securities, Treasury bills, acceptances, bills and negotiable certificates of deposit. The finance houses are primarily involved in financing hire purchase agreements.

The preceding financial institutions comprise the registered institutions under the Banking Act (1964). Other important financial institutions include the building societies (15.7 per cent of total assets of the banking sector in 1987), the Post Office Savings Bank (POSB) (20.8 per cent), representative offices of various international banks, insurance companies and provident funds and development institutions. The range and development of all of these financial institutions are indicative of the comparative sophistication of

Zimbabwe's financial system. Between 1975 and 1987, financial institutions' assets increased at an annual average rate of 12.4 per cent; GNP growth during this same period was 13.7 per cent.

Table 2 summarises the growth rate of assets of financial institutions from 1975 to 1987. It is clear that annual growth rates have been irregular: growth was higher between 1979 and 1981 than in the periods 1975-1978 and 1982-87. These growth performances correlate positively with the corresponding trend growth in GDP. Table 2 also shows the ratios of financial assets to GNP, which ranged between 77.9 and 98.0 per cent. The latter, high ratios follow the generally observed trend during the process of economic development: see, for example, Gurley and Shaw (1960) and Goldsmith (1969).

Table 2: Growth of Assets of Financial Institutions

Year end	Total assets	Growth rate (%)	Assets/GNP(%)
1975	1822.3		
1976	2000.2	9.8	93.3
1977	2078.6	3.9	94.9
1978	2186.1	5.2	96.6
1979	2499.5	14.2	98.0
1980	2967.5	18.7	94.3
1981	3509.9	18.3	87.4
1982	3946.8	12.4	81.3
1983	4471.6	13.3	79.6
1984	4999.1	11.8	77.9
1985	5731.4	12.7	81.7
1986	6380.8	11.3	79.8
1987	7466.4	17.0	83.7

Source: *Quarterly Economic and Statistical Review*, December 1985, Reserve Bank, Harare; *Statistical Yearbook* (1985), CSO Harare; CSO, *Quarterly Digest of Statistics* (September 1988), Harare.

Note: Financial institutions included are the Reserve Bank, commercial banks, accepting houses, discount houses, finance houses, Post Office Savings Bank, building societies, Agricultural Finance Corporation.

Several factors contributed to the marked growth of financial assets summarised in Table 2. These include the opening up of the financial system in order to help stimulate greater economic activity, the government's policy of encouraging commercial banks to expand their services (especially to the rural and previously unbanked sectors) and the development of new financial institutions. Different types of financial institutions did not grow at a uniform rate during the period 1975-87: the fastest growing institutions were the Reserve Bank (average 17.0 per cent), commercial banks (13.5 per cent) and the POSB (18.2 per cent). Annual growth rates (especially of the banking institutions) declined during

the 1980s. Table 3 summarises various, select financial development ratios for Zimbabwe during the period 1975-87.

Table 3: Financial Development Ratios (Percentages)

Year	Total assets/ GNP	Demand deposits/ Money supply	Time and savings deposits to money supply
1975	31.2	48.5	71.2
1976	31.0	44.2	67.2
1977	31.5	41.2	68.7
1978	30.2	40.9	58.8
1979	27.6	41.7	52.1
1980	28.9	43.4	46.3
1981	28.4	43.8	58.0
1982	28.9	39.7	64.6
1983	25.5	37.9	65.5
1984	27.7	34.7	62.8
1985	29.4	41.5	68.8
1986	28.2	40.4	64.6
1987	29.4	40.9	67.8

Sources: CSO *Quarterly Digest of Statistics*, June 1987 Reserve Bank of Zimbabwe, *Quarterly Economic and Statistical Review*, March 1987

Although at independence (1980) Zimbabwe inherited a well-established financial system with all of the main institutions characterising a developed economy, several features of underdevelopment were evident. Around 80 per cent of the commercial banks were still foreign-owned; the population per branch was very high at around 62,000; and about 90 per cent of deposits and advances were concentrated in Zimbabwe's four largest cities. Nevertheless, the importance of Zimbabwe's financial sector has increased; this is reflected in the increase in its contribution to GDP and the overall growth in financial sector assets. Within Zimbabwe the financial sector is seen as a major contributor to the development of the nation's commercial and industrial sectors and the economy as a whole.

2. Evolution of Banking Supervision

There are several distinct periods in the history of Zimbabwe which have shaped the financial system and its regulation. The main periods of Zimbabwe's modern financial development were marked by the establishment of a Currency Board in 1938, the Bank

of Rhodesia and Nyasaland in 1956, the Reserve Bank of Rhodesia in 1965, and the Reserve Bank in Zimbabwe in 1980. The establishment of the central bank in 1956 was really the beginning of the financial regulation of banks in the modern sense. However, before UDI (Unilateral Declaration of Independence) in 1965 the activities of the foreign banks were dictated largely by external influences; with the onset of sanctions, the control of the Reserve Bank over the financial and monetary system was strengthened.

The functions of the commercial banks, discount houses, merchant banks and finance houses are regulated by the Banking Act, 1964 (Chapter 188). These financial institutions are regulated and guided further by the Reserve Bank Act of 1956, which gives the Reserve Bank the usual powers of a modern Central Bank. The 1964 Banking Act covers regulations on registration, general requirements, basic financial requirements, limitations of transactions, statements and secrecy. Basic financial requirements encompass minimum capital levels, transfers of specific percentages of profits to reserves and minimum liquidity ratio levels. During the 1980s the Reserve Bank began to collect capital adequacy and supervisory data as a prelude to more formal supervision.

At the time of the research reported in this paper (the late 1980s/early 1990s), Zimbabwe was proposing to embark on a structural adjustment and liberalisation process within its financial sector². Alongside the monitoring and reduction of systemic risk potential, Zimbabwe's supervisory aims encompass the 'levelling of playing fields', a progression towards greater competitive neutrality between historically segmented financial institutions who now increasingly compete with each other or who may wish to do so in the future.

3. Field Survey Methodology and Results

A detailed field survey was conducted in Zimbabwe (in 1987) in order to gather

2. Zimbabwe embarked on an Economic Structural Adjustment Programme (ESAP) in 1991. One of the major areas of focus within this programme is financial sector reform. Changes in the financial sector were necessitated by the need to enhance the efficiency and soundness of financial institutions. The reform measures adopted include deregulation of interest rates, exchange controls, and liberalisation of restrictions on entry of local and foreign institutions. The economic effects of a deregulated financial environment and the need to maintain safety and soundness of financial institutions continue to be recognised by the authorities. This has been translated into a need to strengthen further the supervisory machinery. In order to achieve this it has been decided to put new banking legislation in place. Such legislation should *inter alia* enable supervisory authorities to enforce prudential standards like capital adequacy. In 1995 Zimbabwe agreed to adopt the 1988 Basle international bank capital-adequacy accord.

bankers' views and that of the Reserve Bank on supervision: see Dhlwayo (1990). The sample comprised the Reserve Bank of Zimbabwe, five commercial banks and four merchant banks. Structured questionnaires were used for gathering the data; separate questionnaires were used for the Reserve Bank and the rest of the banking sample. Open and closed questions were used in this survey in order both to help respondents (supervision was a new experience to many respondents) and to allow them to express their own views: see Fowler (1984).

Within this survey, four main reasons were elicited from the Reserve Bank to support the need for bank supervision. First, bank failures had increased internationally and Zimbabwe did not want to be caught unawares. The second reason given was that Zimbabwe is a member of the BIS (Bank International Settlements), which has developed new (1988) rules for bank capital adequacy (the 1988 Basle international bank capital-adequacy accord) and has emphasised the need to harmonise internationally the supervision of bank capital adequacy (see Committee on Bank Regulations and Supervisory Practices, 1988). The third consideration was that in Zimbabwe major companies in mining and agriculture are subject to fluctuations in their profitability because of drought and other problems. Thus, any problems with these companies can increase banking risk because banks are heavily exposed in lending to these same companies. The fourth reason given was that by supervising banks, the authorities would deepen their own knowledge about the operations and problems faced by banks.

The survey results suggested that the continued maintenance of confidence in the banking system is (and remains) a primary supervisory objective in Zimbabwe. The Reserve Bank employs a CAMEL rating system in order to appraise a bank's overall soundness; this system takes into account the bank's Capital, the quality of its Assets, its Management, Earnings and Liquidity. Capital adequacy (balance-sheet ratio) rules appear to be the core quantitative control mechanism favoured by the authorities. A minimum gearing ratio (capital/public liabilities) of 5 per cent is set for all banks. The Reserve Bank uses this ratio requirement as a kind of 'trigger mechanism': a bank below or near the minimum indicates *ceteris paribus* the need for greater supervision. The Reserve Bank also considers on-site examinations to be a necessary complement to off-site supervision. The three areas on which the authorities particularly focus in Zimbabwe are capital adequacy (the single, most important area), liquidity and large lending exposures.

The commercial and merchant bankers interviewed felt that bank supervision in Zimbabwe was necessary. One banker drew attention to the role of supervision in

preventing banks from over-extending themselves, especially in new areas of business. Other bankers also felt supervision was necessary because of global trends and linkages in banking, the breakdown of historical institutional barriers between financial institutions ('structural diffusion' or 'structural arbitrage')³, and developing off-balance-sheet activities in banking. Nevertheless, many banks suggested that although supervision was necessary, the authorities should not over-regulate. It was felt by many bankers that supervision may best be developed through a consultative process between the banks and the supervisory authorities; it was also emphasised that the banks in Zimbabwe are fundamentally responsible operators and exercise their own self-regulation.

Bankers were unanimous in their view that the most important objectives of supervision were the preservation of the stability of the banking system and the protection of depositors. Many bankers felt that one effect of stricter capital-adequacy regulation would be to increase the rate of financial innovation by the banks. This fits in with the 'regulatory-dialectic' or 'struggle model' that stylises regulation helping to stimulate regulation-avoidance innovations by banks: see Sinkey (1992, pp;153-57). Another interesting point made was that many bankers in Zimbabwe emphasised the need to compare themselves with other banks internationally for capital adequacy purposes⁴.

4. Rationale for Capital Adequacy Supervision

Fry (1988, p.430) suggests that:

- ... because inappropriate regulations and inadequate supervision have been the norm, a strong current of academic opinion favours minimalist government intervention in a country's financial sector.

As we shall see later, however, Fry (1988) recognises clearly the important role of 'proper' supervision in a developmental context.

The practical (bankers and Reserve Bank) rationale for capital adequacy supervision in Zimbabwe was elicited from the preceding survey. At a pragmatic level, the case for stronger supervision has generally arisen from events in the market: see Gardener (1990, p.109). Many economists argue strongly the case for no, or much reduced, banking regulation, but the majority seem to accept that at least some banking regulation is necessary.

Baltensperger and Dermine (1987a) conclude that no general macroeconomic case

3. See, for example, Gardener (1993, ch.2).

4. See Dhlwayo (1990) for a more detailed analysis of these field survey results.

can be advanced for banking regulation, and they suggest that the analysis of microeconomic issues is more relevant and useful. In this context, they emphasise that asymmetric information and the risks of contagion in a panic can lead to runs against the banking system. To the extent that these events are socially inefficient, public intervention of some kind may be justified. As banking risks, actual and perceived, have increased, this presumption has been reinforced.

Several economists have argued that unregulated banking would be 'risk free': see, for example, Kareken and Wallace (1978) and Dothen and Williams (1980). In this world, profit-maximising bankers would choose of their own volition an asset portfolio and deposit/equity ratio that involved no depositor loss or risk of insolvency. In their review of this hypothesis and the related literature, however, Lewis and Davis (1987, p.134) suggest this would be an unlikely result in competitive markets. Baltensperger and Dermine (1987b) and Pecchioli (1987b) *inter alia* support the same pragmatic conclusions as Lewis and Davis (1987).

The practical importance of effective prudential supervision (of which capital adequacy is a key component) seems to be enhanced in an environment of structural deregulation. As a result, supervisory re-regulation appears to be a necessary policy complement to this kind of liberalisation process. Effective supervision can be seen as necessary in order to keep the deregulating system safe through its transition phase from a more to the (desirable) less-regulated state. During this phase, there may be increased, perhaps transient, dangers as new risk/return opportunities are absorbed into banking (and other) portfolios. There may also be dangers of 'overshooting behaviour' by deregulated institutions as they adjust their portfolios to the new environment (see Fischer, 1993). It is these kinds of practical aspects of the market that appear to support the view that some supervisory re-regulation is both necessary and desirable in order to help secure the economic benefits sought through the contemporaneous process of structural deregulation. Of course, the practical policy dilemma is getting the balance right between structural deregulation, on the one hand, and supervisory (and capital adequacy) re-regulation, on the other.

This policy importance of effective bank supervision in a deregulating and developmental context is, in fact, well-known. For example, Fry (1988, p.425), notes:

- Experience suggests there are at least two prerequisites for successful financial liberalisation - macroeconomic stability and adequate bank supervision. Price stability, fiscal discipline, and policy credibility may well be the three key factors explaining Asian successes and Latin American failures over the

past three decades.

- He adds (1988, p.425)

Regulation and supervision are the areas in most urgent need of further research. Indeed, these are possibly the fields in which future work on financial sector problems in developing countries could bear most fruit.

A rich theoretical literature exists on the impact of various capital-adequacy rules on banking performance (return) and condition (risk).

Much of the basic capital-adequacy literature in banking theory is grounded in Markowitzian portfolio theory, and this literature is reviewed by Dhlwayo (1990, ch.7) and Di Cagno (1990). This literature supports the view that the risk asset ratio (RAR) is an effective balance-sheet-based ratio system for restraining bank-risk taking and helping (alongside minimum capital levels) to reduce the probability of bank failures: see, for example, Lackman (1986). Other, simpler capital-adequacy ratios (like capital/deposits and capital/total assets) are not so effective, and may even be risk-stimulating for banks under some circumstances. Within a RAR scheme, quanta of a bank's (supervisory-defined) capital are allocated to the monetary total of assets falling into specified 'risk classes'. In the new (1988) and widely-adopted Basle (or BIS) scheme for international bank capital adequacy, for example, there are five such 'risk classes', and banking off-balance-sheet activities are brought into the system: see Committee on Bank Regulations and Supervisory Practices (1988).

5. Comparative and Exploratory Analysis

An empirical analysis was undertaken of the impact on banking risk and return of the present and evolving supervisory system in Zimbabwe. The objective was to help inform proposals to develop effectively the country's supervisory policy within a climate of increasing liberalisation, or structural deregulation. The empirical focus of this exercise was on banking system 'improvements' resulting from supervision, measured in terms of corresponding positive (beneficial) increments in bank performance (return) and condition (risk) indicators. *Ceteris paribus*, movements in banking return and risk are indicative of corresponding changes in banking efficiency frontiers. The general methodological approach employed was to analyse trends in banks' performance and condition measures (from banks' published balance sheets and income statements) before and after the implementation of supervision. The objective of this exploratory analysis was to develop some initial inferences on the possible impact (if any) of supervision on banking risk and return in Zimbabwe.

Given the newness of supervision in Zimbabwe, the smallness of the Zimbabwe bank dataset used by the researchers and the related paucity of specific banking data on Zimbabwe, the dataset analysed was expanded to include other countries. The general criterion used for selecting these countries was that they should be developing countries whose economic, financial and supervisory characteristics and experiences were similar to Zimbabwe. Increasing the size of the dataset in this way should improve the statistical analysis. Another important and related aim was to identify any other methods and/or characteristics of supervision which might be suitable for use in Zimbabwe.

Table 4 summarises the sample country dataset finally selected⁵, together with some of the respective measures of financial depth. These data reveal broad similarities between the countries selected on some measures, but substantial differences on others. In terms of the ratio deposit bank assets/GNP, for example, Nigeria and Kenya are broadly comparable with Zimbabwe, whilst Malawi, Kenya and Belize are more comparable on the basis of the ratio commercial bank assets/GNP. Similar congruent groupings of countries with Zimbabwe are clearly evident in the other two measures of financial depth, broad money/GNP and the circulation ratio.

Table 4: Measures of Financial Depth, 1986

Country	Deposit bank assets/GNP	Commercial bank assets/GNP	Broad money/GNP	Circulation ratio % ⁵
Zimbabwe	57.3	27.3	60.3	7.4
Nigeria	54.3	63.8	67.6	13.8
Malawi	30.9	28.8	36.9	9.8
Kenya	50.2	31.1	44.9	12.6
Belize*	21.4	31.5	20.5	9.5
Cyprus	90.3	90.3	88.3	9.0
Malaysia	87.4	119.0	75.0	6.2

Sources: 1 *International Financial Statistics*, IMF, 1986

2 *International Financial Statistics*, IMF, 1989

3 Various central bank annual reports

4 Researchers' computations

5 Defined as ratio of total currency and deposits (liquid financial assets) in financial institutions.

Note: * GDP figure was used instead of GNP in the first three ratios computed.

5. Although the researchers started with an ideal dataset 'model' (*viz.* countries at the same stage of financial development, the same rate of financial liberalisation, etc.), data availability inevitably influenced to varying degrees the final choice of countries within the dataset analysed. The result was a comparatively small dataset that limited the potential for more detailed statistical work.

Within all of the sample countries, the central bank is responsible for the prudential supervision of banks, and in all cases there is a special department responsible for the supervisory function. The overall aim of supervision in all of the sample countries is to help ensure a viable and sound banking system. Table 5 summarises the capital adequacy ratios used by the country supervisory authorities within the dataset.

It is clear that several different capital-adequacy ratios have been employed, although all of the ratios shown in Table 5 are standard ones and are widely used in other countries. All of the countries studied (except Malawi) had introduced at that time (1987) a minimum capital-adequacy ratio, although these ratios were implemented at different times in the countries studied. An exploratory analysis of individual bank performance and condition before and after the implementation of supervision in each country within the sample revealed great heterogeneity of results; no obvious trends or relationships were evident.

Table 5: Capital Adequacy Systems (at 1987)

Country	Capital/ assets	Capital/ risky assets*	Capital/ deposits	Capital/loans and advances	Capital/ earning assets	Risk assets ratio
Zimbabwe	-	-	Y ⁴	-	-	Y
Malawi	Y ₅	Y ₅	-	Y	Y	Y ³
Kenya	-	-	Y	-	-	-
Nigeria	-	-	-	Y	-	Y ¹
Cyprus	-	Y	-	-	-	-
Malaysia	Y	-	-	-	-	-
Belize	-	-	Y	-	-	-

Source: Dhlwayo (1990, ch. 8, Table 8.9)

Notes: * Risky assets are total bank assets, less cash and government securities

Y indicates "Yes, ratio being used"

1 Nigeria introduced the RAR system in 1988

2 Malaysia is in the process of formulating the RAR system which will replace the gearing ratio system

3 Malawi began assessing capital adequacy using the RAR system in 1988

4 Zimbabwe's gearing ratio is the ratio of adjusted capital/public liabilities; "adjusted capital" is paid-up capital, retained profit, general reserves, and general provisions less investments in subsidiaries.

5 Kenya intended (in 1987) to introduce the capital/assets and capital/risky assets ratios in addition to the capital/deposits ratio

6. Statistical Analysis

In order to explore further the dataset, each performance (return) and condition (risk) variable (see Table 6) was analysed for all supervisory countries combined together as one group. These variables were selected on the basis of their common usage and widespread acceptance as key target variables (by banks and/or the supervisory authorities).

ties) in the countries analysed. This part of the research drew methodologically from the work of Weston and Mansinghka (1971) and Melicher and Rush (1973, 1974).

Table 6: Comparison of Performance and Condition of Banks

Variable	Sample means			F-statistics								
	G1	G2	G3	G1	G2	G1	G3	G2	G3	G1	G2	G3
1975-80												
Performance												
ROC (Return on capital)	18.4	16.1	19.7	0.27		0.08		0.95			0.22	
ROA (Return on assets)	1.7	0.7	1.3	1.29		0.20		5.81*			0.77	
Increase in assets	18.0	29.1	15.8	4.81*		0.20		2.63			2.91	
Increase in deposits	17.3	23.4	7.6	1.64		2.83		3.55			2.50	
Condition												
Capital/assets	6.4	4.7	9.1	2.71		5.10*		55.38			5.27*	
Capital/deposits	8.1	7.0	13.5	0.72		9.58*		19.37*			6.65*	
Loans/deposits	80.1	48.4	114.9	30.05*		17.82*		47.35*			26.99*	
Loans/assets	61.4	32.7	78.7	60.87*		15.71*		267.18*			49.26*	
Capital/risky assets	7.9	5.9	9.7	2.69		1.60		43.91			2.90	
1981-87												
Performance												
ROC	14.8	13.7	18.3	0.11		1.05		0.43			0.43	
ROA	1.1	0.8	1.0	0.95		0.14		0.13			0.53	
Increase in assets	14.6	28.3	16.6	13.02*		0.41		1.41			6.77*	
Increase in deposits	14.1	30.3	17.7	19.71*		1.25		2.39			10.48	
Condition												
Capital/assets	6.8	4.7	10.4	7.18*		15.71*		21.51*			12.57*	
Capital/deposits	8.6	6.9	19.5	3.89		116.03		72.09*			53.44*	
Loans/deposits	32.2	44.1	151.3	56.00*		81.45*		107.61*			78.24*	
Loans/assets	58.5	30.5	80.3	53.13*		21.27*		46.38*			41.18*	
Capital/risky assets	9.2	7.9	10.7	0.83		1.03		1.77			1.10	

Notes: G1 sample of 7 supervisory countries
 G2 sample of 2 non-supervisory countries
 G3 the UK clearing banks
 * significant at the 0.05 level

Source: Dhillwayo (1990, ch.9, Table 9.1)

An important methodological feature of the tests employed is the use of control groups to compare the results of bank performance and condition of the supervisory group. The main null hypothesis tested is that supervision, proxied as the imposition of capital adequacy constraints on banks, will reduce risk in the banking system. Two-tail statistical

testing was employed since banking theory and practical experiences are not unequivocal on the risk and return implications of imposing new capital-adequacy rules of various kinds. For example, imposing some (simple) kinds of capital adequacy ratios and/or the respective innovatory, regulation-avoidance behaviour by banks may lead perversely to increased risk within the banking system.

The original 7-country dataset (see Tables 4 and 5) becomes the 'supervisory group' dataset (G1) in this exercise. A separate dataset (G2)⁶ was constructed that comprised two countries which had virtually no supervision for practical purposes for the period spanned by this investigation. The UK (a developed country with sophisticated supervision) was selected as the second control group (G3); many of the supervisory systems in the G1 group are modelled broadly on the UK system. The null (H0) and alternative (H1) hypotheses are specified below:

$$\begin{aligned} H0 : M1 &= M2 = M3 \\ H1 : M1 &\neq M2 \neq M3 \end{aligned} \quad (1)$$

where the Ms indicate the respective population means of G1, G2 and G3. F-tests were used to test for the difference between means of selected, key performance and condition measures.

Table 6 summarises the initial results; the before - and after - supervision periods were 1975-80 and 1981-87, respectively; 1981 was a kind of benchmark year globally in the sense that supervision in many countries tightened up from around this time. It is interesting to note generally the comparative, greater statistical significance achieved in the condition-measure tests. Within the condition-measure tests, one can also note the generally greater statistical significance achieved in the G1G3, G2G3 and G1G2G3 tests. These findings indicate that supervisory countries generally had higher capital-adequacy ratios after supervision.

The Table 6 results, then, suggest significant differences in capital adequacy, growth and liquidity measures before and after supervision. These findings show that the supervisory group of countries had lower growth in assets and deposits, higher capital assets ratios and lower liquidity than the non-supervisory group; there was no significant difference in terms of profitability. However, the economic significance of these findings

6. These were Sierra Leone and Lesotho, who were identified as being in the very early stages of developing supervision.

for evaluating the effects of supervision (that is, whether supervision improves performance and/or reduces risk in the banking system) was not obvious. One may also note that an apparent lower liquidity position 'after supervision' is, by itself, not necessarily desirable in a prudential sense.

G1/G2 comparisons for the same bank performance and condition measures were also effected on a year-by-year basis⁷, and these results are summarised in Table 7. Within this latter set of F-tests, there was no significant difference between the supervisory countries (G1) and the non-supervisory countries (G2) for the three capital-adequacy ratios measured on a year-by-year basis for all of the years analysed. This does not support the Table 6 results, which implied that supervisory countries generally had higher capital-adequacy ratios after supervision. It is interesting to note, however, that the liquidity mean differences were significant in each year from 1981 to 1986. The possible explanation for the apparent dichotomy between the Table 6 and 7 results is that there were only two observations for the non-supervisory group against seven for the supervisory group. As a result, the yearly comparisons in this regard were not really useful as a further explanation of the effects of supervision.

7. Dhlwayo (1990, ch.9) reports and analyses all of these results in much greater detail.

Table 7: Mean Values and F-Ratio Results for Selected Performance and Condition Variables

Variable	Sample	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987
ROC	G1		14.7	18.2	23.9	15.9	16.2	13.2	11.1	10.8	11.9
	G2	n/a	19.5	12.4	10.8	14.3	37.4	12.7	4.2	13.6	2.8
	F		(0.37)	(0.36)	(1.77)	(0.08)	(3.07)	(0.01)	(0.82)	(0.10)	(1.88)
ROA	G1		1.8	1.7	2.0	1.2	1.3	0.9	0.7	0.8	1.2
	G2	n/a	0.9	0.6	0.2	0.4	2.8	0.7	0.2	1.4	0.2
	F		(0.17)	(0.27)	(1.0)	(0.90)	(0.95)	(0.16)	(5.71)	(0.57*)	(15.17*)
Inc. assets	G1		19.9	19.7	19.3	18.1	12.7	14.6	7.8	14.6	11.8
	G2	n/a	26.9	17.0	27.5	24.4	24.1	25.8	30.4	58.3	7.6
	F		(1.32)	(0.07)	(0.78)	(6.08*)	(3.39)	(2.78)	(9.99*)	(4.32)	(1.11)
Inc. deposits	G1		14.9	19.5	17.7	15.8	10.9	16.2	8.8	13.6	16.4
	G2	n/a	22.0	9.9	25.9	28.2	13.1	34.0	52.3	24.6	34.1
	F		(0.53)	(0.81)	(1.52)	(7.9*)	(0.19)	(2.81)	(12.7*)	(1.89)	(1.53)
Capital/assets	G1	6.5	6.3	6.3	6.4	6.5	6.8	6.7	6.9	6.8	7.4
	G2	4.6	4.5	4.6	4.0	3.7	5.8	5.6	4.3	4.9	4.8
	F		(0.63)	(0.68)	(0.56)	(1.26)	(1.74)	(0.18)	(0.24)	(1.54)	(0.60)
Capital/deposits	G1	8.2	8.5	8.6	8.5	8.8	9.3	9.1	9.4	9.3	9.6
	G2	6.4	6.5	6.9	6.2	5.6	9.1	8.3	5.9	6.7	6.2
	F		(0.37)	(0.42)	(0.29)	(0.95)	(1.69)	(0.01)	(0.08)	(2.07)	(0.78)
Loans/deposits	G1	79.0	85.2	83.7	85.2	87.3	88.1	81.5	80.5	78.0	73.8
	G2	44.2	42.2	51.4	50.1	48.2	46.2	42.5	36.7	44.1	41.6
	F		(20.2)	(4.55)	(3.49)	(9.08*)	(7.25*)	(8.96*)	(7.12*)	(9.03*)	(6.4*)
Loans/assets	G1	61.6	61.1	59.6	61.2	61.1	60.9	57.3	57.2	55.1	56.3
	G2	31.6	29.2	33.5	34.1	33.5	28.9	27.8	27.3	30.3	32.0
	F		(12.33*)	(8.66*)	(4.91)	(7.02*)	(8.46*)	(10.42*)	(7.44*)	(6.80*)	(4.62)
Capital/risky assets	G1	8.7	7.2	7.7	7.8	7.9	8.2	8.6	9.1	9.3	10.5
	G2	5.4	5.7	6.6	6.1	6.0	8.7	8.2	7.1	8.3	10.9
	F		(1.2)	(0.52)	(0.16)	(0.39)	(0.48)	(0.03)	(0.01)	(0.47)	(0.05)

Notes: The F-ratio results are in brackets

G1 sample of 7 countries with supervision

G2 sample of 2 countries without supervision

* significant at the 0.05 level

n/a (1978 column) refers to not available (it was not possible to obtain suitable data for the G1 control group)

Traditionally, supervisors employ various capital-adequacy ratios as first approximations of a bank's risk exposure. If higher capital ratios are taken as measures of banking strength, the present findings indicate that risk exposure has apparently reduced for the

sample supervisory systems. However, banking theory and practice emphasise that capital adequacy ratios alone are far from definitive or complete indicators of full banking risk positions: they must be analysed alongside all other pertinent factors, including earnings capacity. Thus, the increase in capital/assets ratios for the sample countries may not necessarily suggest a reduction of risk. For example, an increase in capital/assets ratios may induce banks to choose more risky portfolio positions which offer higher returns since they need to maintain at least the same level of profitability in order to meet the new capital-adequacy requirements.

Banking theory⁸ suggests that higher capital requirements by themselves may result in higher risk, measured as the variance of ROC (return on capital). The findings reported in this paper indicate higher loans (riskier assets) after supervision relative to total assets: this might have been the result of higher capital ratio requirements by regulators. It implies that some capital ratios at least may not be good measures alone for gauging the relative strength of individual capital positions and may be misleading. This is a particular problem with simple ratios, like gearing, which do not impose any constraints on bank balance-sheet structure or on portfolio mix; five of the sample countries used a gearing ratio. In particular, such ratios do not consider risks within a bank's portfolio. Thus, increasing capital ratios, instead of curbing excessive risk-taking, might sometimes encourage banks to take on more risk that is not fully covered by capital (or other) bank internal resources. In this general context, the important result here is that risk-based capital adequacy requirements do seem to be more important and useful indicators of capital adequacy in banks.

The preceding statistical analysis was developed further, although the detailed results are not reported in this paper. A further sensitivity analysis was conducted where the supervisory countries were grouped according to the type of capital adequacy ratio used: the aim was to compare countries using gearing ratios with those using risk-based capital adequacy systems. These F-tests showed *inter alia* that countries using the capital/risky asset ratio systems had significantly higher capital ratios after supervision. In some of these comparisons, higher ROAs were also recorded after supervision for capital/risk asset countries. In particular, using a risk-based, capital adequacy ratio system seems to be associated with superior banking performance compared with the gearing ratio schemes.

8. See Dhlwayo (1990, ch.7) for a review of the relevant literature.

However, there are severe potential statistical problems inherent with the limited dataset used in the statistical analysis. It was felt that the assumptions⁹ required in order to conduct F-tests may not always be met in the dataset¹⁰. A particular worry was that the required homogeneity of variance assumption may not be satisfied. To address this problem, two-sample t-tests were subsequently used for the comparative analysis instead of F-tests. These t-tests results were broadly similar to the original F-tests, but some differences and inconsistencies were observed in comparing the two sets of results. As another, further check, a non-parametric test was also employed, the Kruskal-Wallis test¹¹. All of these further test results are summarised in Table 8.

9. That is, a random sample from each population, each population has a normal distribution and that all populations have the same variance.

10. The dataset used is very small and random sampling methods, for example, could not generally be used.

11. This tests whether independent sample groups have been drawn from populations possessing equal medians. This procedure requires that measurements need only be ordinal over all sample groups, and the common population distributions need only be continuous; their common shapes are irrelevant. In the F-test, on the other hand, the samples must be assumed as coming from underlying normal populations having equal variances.

Table 8: Comparison of F-Tests, t-tests and Kruskal-Wallis Tests

	Supervisory vs non-supervisory			Supervisory vs UK			Non-supervisory vs UK		
	F	T	H	F	T	H	F	T	H
1975-80									
ROC									
ROA		*							
Increase in assets	*						*	*	
Increase in deposits		*	*					*	*
Capital/assets		*		*	*	*	*	*	*
Capital/deposits			*	*	*	*	*	*	*
Loans/deposits	*	*	*	*	*	*	*	*	*
Loans/assets	*	*	*	*	*	*	*	*	*
1981-87									
ROC									
ROA			*						
Increase in assets	*	*							
Increase in deposits	*	*	*					*	
Capital/assets	*	*		*	*	*	*	*	*
Capital/deposits				*	*	*	*	*	*
Loans/deposits	*	*	*	*	*	*	*	*	*
Loans/assets	*	*	*	*	*	*	*	*	*

Note: * indicates those variables where there were significant differences

F F-tests

T T-tests

H Kruskal-Wallis tests

Source: Dhlwayo (1990, ch. 9, Table 9.12)

Table 8 shows that for some variables the three tests produced the same results, whilst for others they differed. For all of the variables that were significant the direction of change after supervision was the same in all three tests. The overall findings based on the three tests performed indicated that supervision appears to affect banking performance and condition by reducing growth, increasing capital ratios and reducing liquidity measured as balance sheet 'stocks'. The more 'consistent' findings (i.e. where all or at least two of the tests showed significant changes) were the growth in deposits and assets and the capital/assets, loan/deposits and loan/asset ratios. Only the Kruskal-Wallis test indicated that banks experienced higher ROA (return on assets) after supervision.

The overall conclusion from this (albeit limited) statistical analysis, is that the risk-based capital adequacy ratio systems appeared to be associated with superior supervi-

sory results (generally better performance and condition measures) compared with the countries using gearing ratios. This accords with what banking theory suggests; improvements (and changes generally) in banking performance and condition seem to be related to the type of capital adequacy ratios imposed on the banks. It would be dangerous and misleading to assert more than that these preliminary results do seem to tie in with what theory and practical experience suggest¹².

7. Conclusions and Policy Implications

The general policy implications of this exploratory research are to emphasise two findings from the field survey, the experiences of other developing countries during the past three decades, and the exploratory statistical analysis. The first is that effective banking supervision appears to be an important policy requirement in a developing, structurally-deregulating financial environment. The more rapid and extensive the latter deregulation, the greater the respective need for effective supervision. This may only be a short-term, transient need as the system adjusts to the new portfolio-balance positions. However, the experiences with modern, developed financial systems (see Gardener and Molyneux, 1993) seem to suggest that change and innovation in financial systems are not transient phenomena. This does tend to restrict the narrow, comparative-statics view of the need for effective capital-adequacy regulation being essentially a temporary phenomenon. Further analysis of this hypothesis, however, is outside the present brief of this paper.

The second policy lesson is that effective capital-adequacy regulation implies the use of RAR systems alongside minimum capital levels. The limited statistical results reported in this paper at least do not weaken this view. Other support for this view comes from theory, the views of practitioners in the Zimbabwe field survey and the experiences of developed systems during the past two to three decades.

Finally, this exploratory research has also confirmed the present hiatus in our understanding, both theoretically and empirically, of the forces at work in deregulating

12. Data availability did not readily facilitate a more sophisticated, multivariate analysis extending the preceding, exploratory tests. However, a series of deterministic simulation experiments, using an interactive computer simulation model, was used to model the Zimbabwe banking system, and this exercise confirmed in another setting the practical utility of a capital/risk assets approach compared with the gearing ratio in supervision: see Dhlwayo (1990 ch. 10). The latter simulations were used to 'triangulate' the overall research programme; utilising field research, exploratory statistical analysis and the deterministic simulation 'experiments'.

financial systems. Banking theory is comparatively elegant and well-developed on the impact of capital adequacy regulation on the banking firm. Theory is developing (but comparatively less developed) on the likely impact of structural deregulation on bank firm behaviour. What is clearly missing and badly needed is further insight into the impact of simultaneous structural deregulation and capital adequacy re-regulation on banking firm behaviour, in both a developed and a developing financial system context.

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Abstract

Since the early 1970s there has been increasing policy concern with the potentials for systemic risk within developed, free-market banking systems. The increased volume and complexity of banking risks have figured prominently in helping to enhance the practical importance of banking regulatory policies aimed at reducing systemic risk potential. As a result, capital adequacy monitoring and regulation, a core part of bank prudential supervision, have increased in importance. Capital adequacy, then, has generally been re-regulated. This more volatile financial environment heralded by the start of the 1970s has also been characterised inter alia by structure and conduct rules deregulation (which we subsume under the umbrella title 'structural deregulation'), the freeing of financial institutions and markets to compete more freely. The policy aim is to secure the economic gains from free(r)- market resource allocation, which invariably means intensifying competition. Recent empirical research has suggested high potential economic gains from such policies: see, for example, Commission of the European Communities (1988). Developed and developing financial systems have been characterised by a virtually unprecedented commitment to structural deregulation policies during the past two decades. Structural deregulation and capital adequacy (and generally supervisory) re-regulation characterise Zimbabwe and many other developing countries.

Zimbabwe had one of the most highly developed and rapidly changing financial sectors of the small, lower-middle income countries of Africa. This paper explores the rationale, development, role and success up to the late 1980s of capital adequacy regulation in Zimbabwe; in 1995 Zimbabwe adopted the 1988 Basle international bank capital-adequacy accord. Against the background of a brief survey of the Zimbabwean banking and financial system, the development of supervision within Zimbabwe is examined. After considering the economic rationale for re-regulating capital adequacy, an exploratory comparative analysis of the impact of capital adequacy regulation in Zimbabwe is summarised; the period spanned by the empirical research is 1975-87. Finally, the overall policy implications of capital adequacy supervision in Zimbabwe and generally in developing financial systems are assessed.

SURVEILLANCE, RÉGULATION DE LA SUFFISANCE DE CAPITAUX ET DÉVELOPPEMENT BANCAIRE: QUELQUES CAS AU ZIMBABWE

Résumé

Depuis le début des années 1970, on a pris de plus en plus conscience de l'existence potentielle de risques liés aux systèmes bancaires des économies de marché dans les pays développés. L'augmentation du nombre et de la complexité des risques liés aux opérations bancaires a eu pour résultat d'attirer l'attention sur l'importance, dans le domaine bancaire, de la mise en place de politiques régulatrices visant à réduire les risques systémiques potentiels. On accorde, par conséquent, une plus grande importance à la surveillance et à la régulation de la suffisance de capitaux, qui constitue un élément central de la surveillance bancaire. La suffisance de capitaux, donc, en général, a fait l'objet d'une re-réglementation. Cet environnement financier plus volatile, inauguré au début des années 1970, se caractérise aussi- entre autre - par la dérégulation en matière de structure et de déontologie (ce que nous appelons par le terme général de "dérégulation structurelle"), la liberté donnée aux établissements financiers et aux marchés de se livrer une concurrence plus libre. Le but de cette politique est de se procurer les bénéfices économiques liés à une allocation de ressources plus libre, ce qui invariablement a pour conséquence une concurrence accrue.

Le Zimbabwe possède, parmi les petits pays à bas revenus d'Afrique, un des secteurs financiers les plus développés. Dans cet article nous étudions la raison d'être, le développement, le rôle et la réussite, jusqu'à la fin des années 80, de la réglementation de la suffisance de capitaux dans le Zimbabwe. En 1995 le Zimbabwe adhéra à l'accord de Bâle sur la suffisance de capitaux dans le secteur bancaire international. Après un bref tour d'horizon du système bancaire et financier du Zimbabwe, on a étudié l'évolution de mécanismes de surveillance à l'intérieur du Zimbabwe. Après avoir examiné le bien-fondé économique d'une re-réglementation de la suffisance de capitaux, on a effectué une analyse comparative de l'impact de la régulation en matière de suffisance de capitaux en Zimbabwe. La période considérée couvre de 1975 à 1987. Enfin, on a tenté de dégager les implications d'ensemble en matière de politique de la surveillance de la suffisance des capitaux en Zimbabwe, et, d'une manière plus générale, dans les systèmes financiers des pays en voie de développement.