FEATURE ARTICLE

The Profitability of the Banking Sector in Hong Kong

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A profitable banking sector is better able to withstand negative shocks and contribute to the stability of the financial system. Important changes in the operating environment, particularly after the Asian financial crisis, are likely to affect bank profitability.

Empirical analysis finds that both bank-specific as well as macroeconomic factors are important determinants in the profitability of banks. With regard to macroeconomic factors, real GDP growth, inflation and real interest rates have a positive impact. Among bank-specific variables, operational efficiency and business diversification contribute to higher returns on assets, after controlling for differences in the credit quality of loans.

The deterioration in profitability in recent years is mainly attributable to the adverse macroeconomic environment in Hong Kong. However, bank profitability should in general improve as the economy recovers.

I. INTRODUCTION

The banking sector plays an important role in the service-based economy of Hong Kong. Its value-added has been growing steadily over the past decade, from about 5½% of GDP in 1990 to 8½% in 2001. At the same time, its share in total employment has declined from 2.6% in 1995 to 2.3% in 2002, reflecting strong productivity gains achieved through bank consolidation, rationalisation of branch networks and greater utilisation of electronic banking services. The sector contributed 16% of total profits tax in 2001, accounting for about 3% of government revenue.

The banking sector provides worldwide services that enhance the international financial centre status of Hong Kong. Of the world's 500 largest banks, 168 had operations in Hong Kong in 2002, while 107 of the 133 licensed banks in Hong Kong were incorporated outside the territory. Before the Asian financial crisis in 1997, loans to customers outside Hong Kong accounted for over 50% of total lending. This share has declined substantially since then to 12% in 2002, largely reflecting the contraction in Euro-yen Impact Loans and reduced foreign currency borrowing by other economies in the region.[1] Banks in Hong Kong have also been active in the Asian syndicated loans market, arranging on average about 15% of total lending over the past six years.

There have been some important changes in the operating environment of the banking sector in Hong Kong in recent years, which have affected its profitability. These include the effects of the Asian financial crisis, declining global inflation and interest rates, the ongoing consolidation of global banks and persistent weak domestic economic conditions.

This article analyses the evolution of profitability in the banking sector in Hong Kong. Section II discusses recent developments in the sector's

[1] Euro-yen Impact Loans are made to borrowers in Japan by a domestic branch of a Japanese bank, but booked offshore in its Hong Kong office to avoid domestic regulations and to achieve lower funding costs. Regulatory reforms and problems in the Japanese domestic banking system have resulted in a sharp decline in these loans from 1997 (HKMA, 2000).

operating environment and how banks have responded to these changes. Section III considers how some of these changes have affected profitability and presents an empirical study of the determinants. Section IV examines the contribution of bank-specific and macroeconomic factors to variations in profitability across banks and over time. Prospects for bank profitability over the medium-term are discussed. Section V provides concluding remarks.

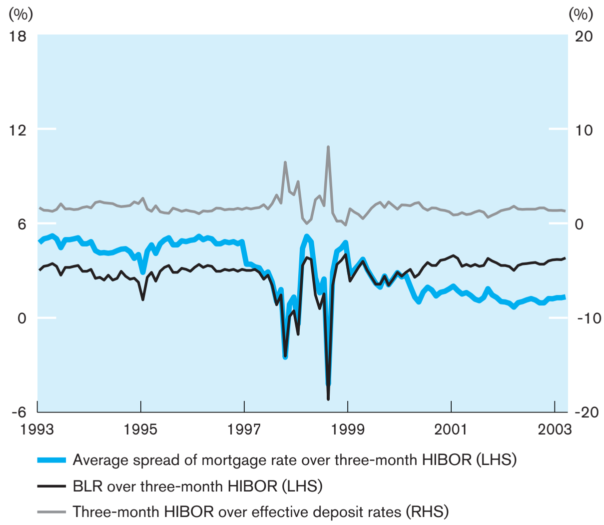
II. RECENT DEVELOPMENTS IN THE BANKING SECTOR

The banking sector in Hong Kong has experienced significant changes in its operating environment in recent years. Both external and domestic factors have affected its performance and structure. As mentioned above, notable external developments include the effects of Asian financial crisis, declining global interest rates and an ongoing process of consolidation by the big international banks. In addition to external factors, a number of domestic developments have affected banks' profitability in recent years. In particular, the collapse in property prices, a sustained period of weak domestic demand conditions and deflation have created a difficult trading environment for domestic banks. The balance sheets of corporations and households were weakened by falling property prices, with an increasing number of homeowners becoming negative equity holders.

In addition to weaker economic conditions, a number of regulatory changes implemented by the HKMA since 1998, such as the deregulation of the Interest Rate Rules and relaxation of the one branch policy for foreign banks, could increase competition in the local banking sector and reduce banks' ability to set their own lending and deposit margins.[2] Although the lending margin, measured by the best lending rates (BLR) over the three-month HIBOR, has increased slightly, from around 3% in 1996 to over 3½% in 2003, the margin for mortgage loans has declined substantially, from 300 basis points (bps) above three-month HIBOR prior to the crisis to less than 100 bps in early 2003.[3] Since mortgage lending constitutes about 30% of total bank loans, the overall lending margin for banks is likely to have declined during this period. The deposit margin, measured by the spread between three-month HIBOR and effective deposit rates, has been relatively stable (except during the crisis period), as the effect of excess liquidity in the local banking system is possibly offset by increasing competition (Chart 1).

CHART 1

Lending and Deposit Margins



Sources: HKMA and CEIC.

Banks have responded to the changing environment by improving asset-liability management, expanding consumer finance, and increasing their business fee income. With ample liquidity in the banking system, but limited credit expansion opportunities, banks have increased their holdings of bonds to 19% of total assets in 2002 from 6% in 1997.[4] While loans to customers remain their core business, their share

[2] The separate analysis of lending and deposit margins follows the Klein-Monti model of banking competition. It assumes that banks have some market power in setting prices in both the credit and deposit markets, but cannot influence the interbank money market or long-term debt market. It further assumes that costs are separable by activity and no cross subsidisation (ECB, 2000).

[3] Mortgages in Hong Kong are predominantly floating rate loans priced against the BLR. The mortgage rate has declined from 125 bps over the BLR prior to the crisis to 250 bps below in February 2003.

[4] Bonds here include floating rate notes, government bills, notes and bonds, and other debt instruments.

has declined from about 47% in 1997 to 41% in 2002. Compared to the stylised bank balance sheet of G10 countries, Hong Kong banks have held more assets in securities and inter-bank lending. There is still plenty of scope for Hong Kong banks to expand their use of debt securities as an alternative source of funding to customer deposits (Tables 1 and 2).

To enhance their income growth, banks have diversified their businesses by expanding consumer finance and fee-generating services. They have increasingly shifted to higher risk and return products, such as credit cards and other types of personal finance. In addition, banks have sought to expand their role as financial service providers —

TABLE 1

Balance Sheet of Hong Kong Banks

Assets (per cent)	**1997**	**2000**	**2002**	**Liabilities** (per cent)	**1997**	**2000**	**2002**
Cash and cash equivalents	0.4	0.4	0.3	Interbank borrowing	18.4	11.7	8.2
Interbank lending	36.3	39.4	28.3	Customer deposits	65.5	74.8	76.5
Securities	9.6	15.7	23.2	Debt securities	4.8	3.4	3.9
Negotiable certificates of deposits	*1.8*	*2.1*	*2.3*	*Negotiable certificates of deposits*	*4.6*	*3.2*	*3.9*
Acceptance and bills of exchange	*1.2*	*0.5*	*0.7*	*Other debt instruments*	*0.2*	*0.1*	*0.02*
Commercial papers	*0.8*	*2.0*	*0.8*	Capital, reserves and other liabilities	11.3	10.1	11.5
Floating rate notes	*0.9*	*2.0*	*5.1*				
Government bills, notes and bonds	*4.0*	*4.9*	*5.8*				
Other debt instruments	*0.9*	*4.1*	*8.5*				
Loans and advances to customers	47.4	39.3	40.9				
Inside Hong Kong	*45.3*	*38.2*	*40.0*				
Outside Hong Kong	*2.1*	*1.1*	*0.9*				
Other assets	6.4	5.2	7.2				
Total assets	100	100	100	Total liabilities	100	100	100

Source: HKMA.
Note: Hong Kong banks refer to retail banks, which include all the locally incorporated banks plus the local offices of a number of large foreign banks.

TABLE 2

Stylised Bank Balance Sheet

Assets	(per cent)	**Liabilities**	(per cent)
Cash and cash equivalents	0.8	Interbank borrowing	10.1
Interbank lending	12.4	Customer deposits	60.4
Securities	8.5	Debt securities	10.9
Loans and advances to customers	68.2	Capital, reserves and other liabilities	18.6
Tangible and intangible fixed assets	1.9		
Other assets	8.2		
Total assets	100	Total liabilities	100

Source: BIS, 2001.
Note: The stylised bank balance sheet is prepared by the Joint Forum banking working group, with supervisory representatives from countries including Belgium, France, Germany, Italy, Japan, Switzerland, the United Kingdom and the United States.

earning fee income from wealth management and selling securities, unit trusts, insurance, pensions, and private banking (Carse, 2001) (Table 3). However, banks in Hong Kong still rely more heavily on interest income than their US counterparts and there is room for further expanding the non-interest income share of profits (Stiroh, 2002).[5]

TABLE 3
Income Structure of Hong Kong Banks

	(per cent)		
	1992	**1997**	**2001**
Interest income	81.6	88.0	84.7
Non-interest income	18.4	12.0	15.3
Gross income	100	100	100

Source: HKMA.
Notes: Hong Kong banks refer to retail banks.
Gross income is interest income plus non-interest income.
Non-interest income includes gains less losses from foreign exchange operations and trading in derivatives, income from investments, income from fees and commissions, and profit/loss on sale of fixed assets and other.

III. DETERMINANTS OF BANK PROFITABILITY

1. Profitability Indicators

A key indicator of banks' profitability is the return on assets (ROA), defined as the before-tax profits (BTP) divided by total assets (TA). It can be decomposed into four constituent parts by an accounting identity:

$$profitability = ROA = \frac{BTP}{TA} = \frac{NI}{TA} + \frac{NII}{TA} - \frac{OV}{TA} - \frac{LLP}{TA}$$

where NI is net interest income, NII is non-interest income, OV is non-interest overhead expenses and LLP is loan loss provisioning.

The net interest margin ($\frac{NI}{TA}$) creates a wedge between returns to savers and investors and reflects the cost of bank intermediation services and the efficiency of the banking sector. In general, the higher the net interest margin, the higher are banks' profit margins and more stable is the banking sector. However, a higher net interest margin could reflect riskier lending practices associated with substantial loan loss provisions and could be an indication of inefficiency in the banking sector.

The Hong Kong banking sector experienced a considerable decline in profitability following the Asian financial crisis, but quickly recovered. In the wake of the crisis, the post-tax ROA of all authorized institutions (AIs) declined from 0.60% in 1997 to 0.28% in 1998, although this was moderate compared with other crisis-hit economies in Asia (Table 4). The decline in profitability was largely due to a substantial increase in non-performing loans. Since 2000, the asset quality of banks has improved steadily as lower interest rates have improved the ability of households to service their debt, limiting the number of mortgage defaults and rescheduled loans as economic growth has slowed. However, loan loss provisions are still running at a higher level than before the crisis mainly because of a high delinquency ratio in consumer finance, especially credit card loans, which have been a recent source of lending growth.

The recovery in banking sector profitability has been helped by an increase in net interest margins. This primarily reflects an improvement in asset-liability management of the banking sector and, in particular, the investment of excess liquidity in higher-yielding securities. By contrast, the operating efficiency of banks, as measured by the cost-income ratio, has weakened in recent years. This largely reflects the one-off costs of restructuring arising from business integration and bank network reshuffling, and greater investment in information technology. Going forward, these same factors should help to improve operational efficiency.[6]

[5] However, Stiroh (2002) also finds that, while diversification may increase banks' profitability, it may not enhance the stability of profits. This reflects a higher correlation between the growth rates of net interest income and non-interest income, particularly service charges and fees, as banks have become more successful at cross-selling products and the fact that some elements of non-interest income, in particular trading income, are more volatile than net interest income.

[6] Note that earlier studies found that Hong Kong banks were efficient by international and regional standards. Studies found that the efficiency of Hong Kong banks was comparable to that in the US, with cost inefficiency averaging about 16-30% of total costs. Furthermore, the unit cost of production in Hong Kong banks was similar to Singapore, but lower than those in South Korea, Indonesia, Thailand, Malaysia and Philippines. The level of inefficiency in Hong Kong declined over time during 1992-99. Larger banks were found to be more efficient, after controlling bank characteristics (Kwan, 2002).

TABLE 4

Profitability Indicators of the Hong Kong Banking Sector, 1997-2002

	(per cent)					
	1997	**1998**	**1999**	**2000**	**2001**	**2002**
Hong Kong (All AIs)						
Return on assets (post-tax)	0.60	0.28	0.39	0.77	0.76	0.81
Net interest margin	1.08	1.13	1.34	1.43	1.45	1.52
Cost-income ratio[1]	45.9	48.3	44.2	45.5	48.0	47.3
Bad debt charge to total assets	0.13	0.45	0.64	0.26	0.23	0.24
Return on assets (post-tax)						
Asia[2]	-0.1	-4.4	-2.0	0.0	0.4	1.0
Japan	0.0	-0.6	-0.5	0.2	0.0	-0.4
United States	1.3	1.1	1.3	1.2	1.1	1.4
Canada	0.7	0.5	0.7	0.7	0.6	0.5

Sources: HKMA, 2002 and IMF, 2003.

Notes: [1] Cost-income ratio is defined as operating expenses as a percentage of total operating income.
[2] Asia includes India, Indonesia, Korea, Malaysia, Pakistan, Philippines and Thailand.

2. An Empirical Study of the Determinants of Banking Sector Profitability

The empirical analysis finds that both individual bank characteristics and macroeconomic factors are important determinants of bank profitability in Hong Kong (Appendix).[7] Among the bank-specific variables, provisions for losses, non-interest expenditure share, and non-interest income share are the major factors. This implies that after controlling for the differences in credit quality of bank lending portfolios (with higher provisions reducing profits), a more efficiently operated and diversified bank (with lower non-interest expenditure and higher non-interest income) achieves higher profits. All macroeconomic variables are significant — higher real GDP growth, inflation and real interest rates are found to be positively related to profitability.

The tax rate variable has a positive effect on the ROA (but is significant in the random effects models only), suggesting that banks successfully manage to pass through increases in corporate income tax to their customers to maintain the level of post-tax ROA. The size variable, represented by loans or deposits, has a negative relationship with profitability (but is only significant in the fixed effects models), suggesting that, on average, larger banks achieve a lower ROA than smaller ones, after controlling for other bank-specific and macroeconomic factors. This is evidence that the interbank market is competitive and efficient since banks with a large retail deposit-taking network do not gain a cost advantage against other banks after taking into account the expenses associated with attracting deposits. Nonetheless, larger banks may benefit from their network by cross-selling non-interest income-generating products, thereby improving their profitability.

With regard to ownership, the results suggest that local and Mainland-owned banks achieved a lower ROA, on average, than foreign banks in this specific sample period, though local banks appeared to be more efficient than Mainland-owned banks. These findings, like all statistical results, should be interpreted with caution. In particular, past performance is not necessarily indicative of future returns. Furthermore, the dummy variables used to capture ownership prevent the use of fixed effects panel regression techniques. This could distort the estimates.

[7] For technical details, see HKMA (2003).

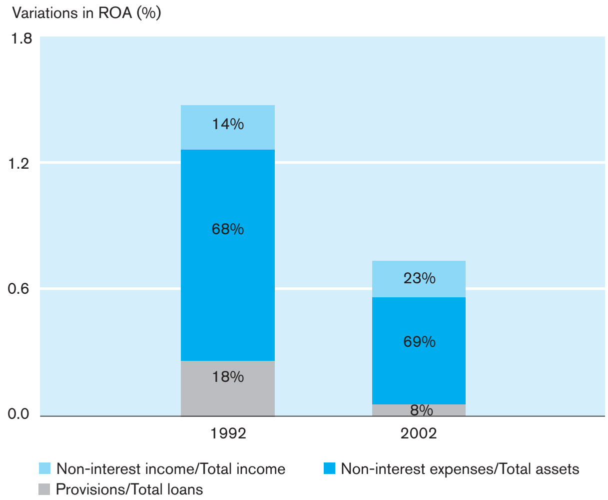
The equity capital ratio and the share of loans and deposits in total assets are not significantly related to bank profitability. The latter implies that gaining market share would be unlikely to increase ROA. The proxy for regional financing and index of local market concentration are also not significant, suggesting that banks' profitability is mainly driven by local conditions, and the modest decline in market concentration in recent years may not be sufficient to induce changes in the competitive pressure (Demirguc-Kunt and Huizinga, 2000; Karasulu, 2001).

IV. IMPLICATIONS

Over our sample period, differences in profitability between banks appear to have diminished and the importance of bank-specific factors in determining profitability has changed.[8] In 1992, a bank with loan loss provision and non-interest expenditure ratios one standard deviation below the mean, and a non-interest income ratio one standard deviation above the mean, would have achieved an ROA of 1.6 percentage point (or 110%) higher than the average bank (Chart 2). In 2002, the same bank would get an ROA of 0.8 percentage point (or 60%) higher than an average bank in that year. The decline in the differential suggests that over time the performance of banks has become more homogeneous. In addition, the relative importance of bank-specific factors in determining profitability has also changed over time. The operational efficiency, measured by non-interest expenditure ratio, remains the most important factor in determining performance, accounting for over two-thirds of the difference in profitability between banks. Nonetheless, the effect of credit quality has declined, possibly reflecting a general improvement in credit risk management and more effective supervision. At the same time, income diversification has become more important. These changes imply that, while controlling operating expenditure remains the most important task for bank management, banks increasingly have to compete by expanding into non-interest income generating business to become more profitable. Results are similar if differences among banks are measured by the maximum and minimum observed values instead of the standard deviations from the mean.

CHART 2

Factors Contributing to the Variations in Profitability across Banks



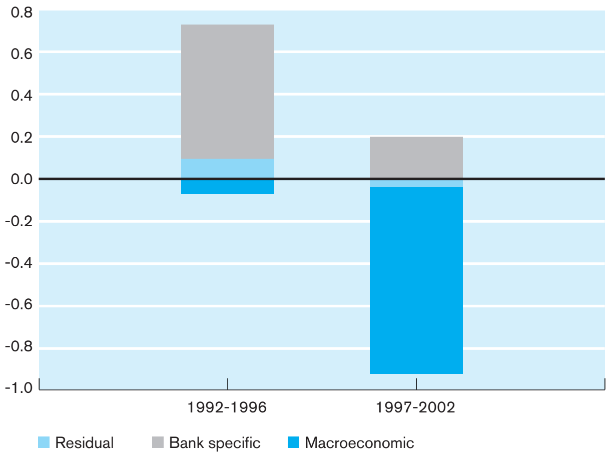
Note: Based on one standard deviation from the mean of variables.
Sources: Primark and HKMA staff calculations.

The macroeconomic environment has played a central role in affecting bank profitability in recent years. Between 1992 and 1996, the average ROA rose by 0.7 percentage points. Changes in an average bank's characteristics accounted for 96% of the improvement, driven by more efficient operations, as reflected in a sharp drop in the ratio of non-interest expenditure to total assets and an improvement in asset quality (Chart 3). Macroeconomic influences played a much smaller role in determining banks' profitability over this earlier period. The negative effect on profitability from lower inflation was offset by higher real interest rates, while the slowdown in real GDP exerted a small negative effect on profitability. By contrast, macroeconomic factors seem to explain much of the decline in the average ROA of 0.7 percentage points between 1997 and 2002. Deflation made the largest contribution to declining profitability. This was only partly offset by banks' efforts to respond to the adverse operating environment by diversifying into non-interest income business.

[8] Despite efforts to model bank-specific characteristics by using data from individual banks, important factors such as ownership structure may be omitted. Our study therefore applies the fixed effect models in which part of the idiosyncrasy could be captured by the different intercepts for each bank.

CHART 3

Factors Contributing to Changes in Profitability over time



Sources: Primark and HKMA staff calculations.

Looking forward, bank profitability should improve as the economy recovers. Under reasonably conservative assumptions regarding growth and inflation over the three years from 2003 to 2005,

TABLE 5

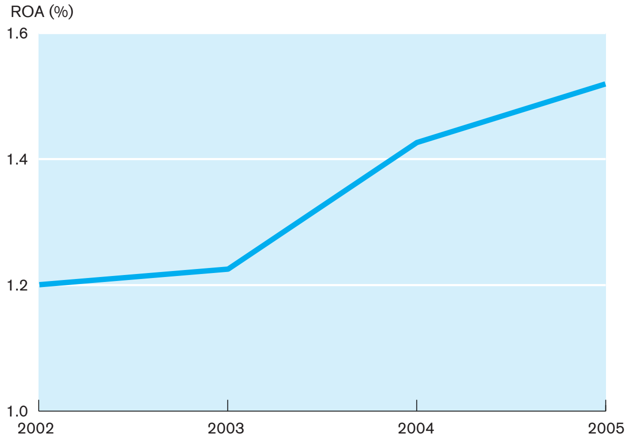
Assumptions on Macroeconomic Variables

	2003	2004	2005
Real GDP growth rate	2.2	3.1	3.4
CPI inflation	-2.0	-1.4	-0.7
Interest rates	1.7	3.5	4.2

Notes: Growth and inflation are based on IMF May 2003 staff projections.
Interest rates are six-month US dollar LIBOR from IMF, April 2003 WEO.

CHART 4

Prospects for Bank Profitability



Sources: Primark and HKMA staff calculations.

average bank profitability should recover by 2005 to a level equal to the average ROA achieved over the past 10 years (Table 5 and Chart 4).

V. CONCLUSIONS

A profitable banking sector is better able to withstand negative shocks and contribute to the stability of the financial system. This study attempts to quantify factors affecting the profitability of banks in Hong Kong. In terms of bank-specific factors, operational efficiency is the most important factor in explaining differences in profitability across the banks in our sample, implying that cost control remains a key task for bank management. In recent years, the pressures on banks' profitability from their more traditional lending business have intensified, causing them to diversify into non-interest income generating business to remain competitive.

In addition to bank-specific factors, macroeconomic developments have an important effect on banks' profitability post-Asian financial crisis. The deterioration in profitability in recent years is mainly attributable to changes in the macroeconomic environment in Hong Kong and, in particular, the persistent deflation in general prices. Looking forward, bank profitability should improve with the macroeconomic environment.

APPENDIX

RESULTS FROM PANEL REGRESSION

Dependent Variable: Operating Profit Before Tax/Total Assets
Sample Period: 1992 - 2002

	Regression Results			
	(1)		(2)	
Independent Variables	**Fixed Effects**	**Random Effects**	**Fixed Effects**	**Random Effects**
Constant	—	1.246	—	1.664**
	—	(0.803)	—	(0.244)
Bank Characteristics				
Equity capital/Total assets	0.001	-0.002	—	—
	(0.013)	(0.012)	—	—
Loans/Total assets	-0.007	0.004	—	—
	(0.009)	(0.006)	—	—
Customer deposits/Total assets	0.013	0.003	—	—
	(0.009)	(0.007)	—	—
Provisions/Total loans	-0.047*	-0.090*	-0.068**	-0.090**
	(0.027)	(0.023)	(0.024)	(0.023)
Non-interest expenses/Total assets	-0.752*	-0.671*	-0.757**	-0.655**
	(0.081)	(0.069)	(0.075)	(0.062)
Non-interest income/Gross income	0.035*	0.035*	0.034**	0.034**
	(0.011)	(0.010)	(0.010)	(0.009)
Taxes/Operating profit before tax	0.009	0.013*	—	0.013**
	(0.006)	(0.005)	—	(0.005)
Loans (in log)	—	—	—	—
	—	—	—	—
Customer deposits (in log)	—	—	—	—
	—	—	—	—
Mainland-owned bank dummy	—	—	—	—
	—	—	—	—
Local bank dummy	—	—	—	—
	—	—	—	—
Macroeconomic Indicators				
Real GDP growth rate	0.030*	0.038*	0.037**	0.042**
	(0.010)	(0.010)	(0.009)	(0.008)
CPI inflation	0.127*	0.085*	0.118**	0.109**
	(0.042)	(0.034)	(0.024)	(0.023)
Real interest rate	0.065*	0.051	0.080**	0.073**
	(0.034)	(0.033)	(0.023)	(0.023)
Asian syndicated loans arranged by	0.003	0.002	—	—
Hong Kong banks for use outside Hong Kong	(0.002)	(0.002)	—	—
Herfindahl-Hirschman index	-43.536	—	—	—
	(36.121)	—	—	—
Adjusted R-squared	0.837	0.844	0.836	0.848
DW statistics	1.924	1.972	1.926	1.996
Number of observations	134	134	134	134
Number of banks	14	14	14	14

(Continued on next page)

Dependent Variable: Operating Profit Before Tax/Total Assets
Sample Period: 1992 - 2002

	Regression Results				
	(3)		(4)		(5)
Independent Variables	**Fixed Effects**	**Random Effects**	**Fixed Effects**	**Random Effects**	**Common Intercept**
Constant	—	1.254*	—	1.270*	2.641**
	—	(0.705)	—	(0.766)	(0.360)
Bank Characteristics					
Equity capital/Total assets	—	—	—	—	—
	—	—	—	—	—
Loans/Total assets	—	—	—	—	—
	—	—	—	—	—
Customer deposits/Total assets	—	—	—	—	—
	—	—	—	—	—
Provisions/Total loans	-0.073**	-0.087**	-0.079**	-0.087**	-0.090**
	(0.024)	(0.023)	(0.025)	(0.023)	(0.026)
Non-interest expenses/Total assets	-0.791**	-0.670**	-0.788**	-0.668**	-0.650**
	(0.076)	(0.065)	(0.076)	(0.065)	(0.058)
Non-interest income/Gross income	0.037**	0.037**	0.035**	0.037**	0.018*
	(0.010)	(0.009)	(0.010)	(0.009)	(0.009)
Taxes/Operating profit before tax	—	—	—	—	—
	—	—	—	—	—
Loans (in log)	-0.291*	0.034	—	—	—
	(0.150)	(0.048)	—	—	—
Customer deposits (in log)	—	—	-0.331*	0.030	—
	—	—	(0.172)	(0.050)	—
Mainland-owned bank dummy	—	—	—	—	-0.797**
	—	—	—	—	(0.180)
Local bank dummy	—	—	—	—	-0.410**
	—	—	—	—	(0.146)
Macroeconomic Indicators					
Real GDP growth rate	0.031**	0.042**	0.032**	0.042**	0.040**
	(0.009)	(0.009)	(0.009)	(0.009)	(0.010)
CPI inflation	0.121**	0.122**	0.110**	0.124**	0.082**
	(0.024)	(0.024)	(0.024)	(0.023)	(0.025)
Real interest rate	0.099**	0.081**	0.092**	0.083**	0.044*
	(0.025)	(0.024)	(0.024)	(0.023)	(0.025)
Asian syndicated loans arranged by Hong Kong banks for use outside Hong Kong	—	—	—	—	—
	—	—	—	—	—
Herfindahl-Hirschman index	—	—	—	—	—
	—	—	—	—	—
Adjusted R-squared	0.840	0.845	0.840	0.845	0.763
DW statistics	1.925	1.967	1.913	1.971	1.239
Number of observations	134	134	134	134	134
Number of banks	14	14	14	14	14

Sources: Primark and HKMA staff calculations.
Notes: Numbers in bracket are standard errors.
Data from 14 individual banks' annual income and balance sheet statements are collected from Primark, a publicly available commercial database. The 14 banks' operations in Hong Kong accounted for about 45 percent of total assets and 48 percent of total loans of the banking sector at end-2000.
The Herfindahl-Hirschman index refers to the sum of the squared deposit market shares of retail banks in Hong Kong.
* Significant at the 10 percent level.
** Significant at the 1 percent level.

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