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The Impacts of Financial Development on Growth and Sources of Growth at the Vietnamese Provincial Level

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Abstract

This paper examines the role of financial development in growth and sources of growth in Vietnam by using provincial data. The results show that financial development impacts positively on the efficiency of using savings, on the quantity and the quality of investment, on productivity, and hence on growth. In addition, there is an indirect impact of financial development on growth through increasing the quantity of foreign direct investment rather than the quality.

Keywords: Financial development, growth, Vietnam

1. Introduction

The advance in the studies regarding the relationship between financial development and growth has come from pioneering researchers such as Goldsmith (1969) to recent authors like Levine (1999), and Liu and Hsu (2006). In general, most researchers support the role of financial development in growth and sources of growth.

Goldsmith (1969) suggested a positive correlation between financial development and economic growth. However, the study had a number of limitations. Firstly, the research studied just a limited number of countries. Secondly, it did not systematically control other factors affecting economic growth. In addition, it did not identify the direction of causality. Thirdly, the measure of financial development in that paper could be an inappropriate proxy for the functioning of the financial system (King and Levine, 1993; Levine, 1997). Finally, the results of both the theoretical background and the empirical evidence were still primary and rough (Eschenback, 2004).

King and Levine (1993) overcame the shortcomings of Goldsmith (1969) by using the data of 77 countries during the period 1960-1989 and constructing additional measures of financial development[1] to show the strong positive relationship through three growth indicators[2]. They stated that financial development was a good predictor of subsequent rates of economic growth, capital accumulation and productivity growth. Although these results resolved the limitations of Goldsmith (1969), some problems reamained. Firstly, the study did not formally analyse the causal relationship. Secondly, it focused on only one segment of the financial system, namely banks, even though it improved the measure of financial development (Levine and Zervos, 1998).

As an improvement to the previous study, Levine and Zervos (1998) employed cross-section data of 42 countries from 1976 to1993. They constructed numerous measures of stock market development[3] for their analysis of the relationship between financial development and economic growth. The results showed the following points. Firstly, initial levels of stock market liquidity and banking development were positively and significantly correlated with economic growth. Secondly, there were no tensions between the market based and the bank based systems. Thirdly, the impacts of stock markets and banks on growth contributed through productivity growth rather than capital accumulation. Finally, the relationship between the stock market size[4] and capital accumulation, productivity and economic growth was not significantly correlated. However, the critique of Arestis and Demetriades (1997) for King and Levine (1993)'s work did not end. Arestis and Demetriades (1997) stated that the use of cross-section data to estimate growth equations might have limited evidence for showing the direction of causality.

In response to this critique, Levine (1998, 1999), Levine et al. (2000) used measures of legal origin as instrumental variables procedures and Generalized Method of Moments dynamic panel techniques to present strong positive relationships and causal relationships between financial development and economic growth. In addition, Levine and Zervos (1998) continued to receive critiques from Drifill (2003) and Manning (2002). They pointed out that the implications of Levine and Zervos (1998) for the impact of financial development on economic growth was questionable since a number of results pivot including outliers and regional dummy financial variables, which were insignificant for Asian Tigers. They also stated that using the longitudinal scope of panel data was limited since Levine et al. (2000) used a panel consisting of only five-year averages. This was not a large sample and may have led to estimation bias (Trew, 2006).

There are two concerning issues in the existing literature. Firstly, some channels of transmission from financial development to growth, such as efficiency of investment, have been mentioned in theories but have not been analysed using econometric techniques. Neither has anyone mentioned the efficiency of using savings in the literature. Secondly, previous research, such as Hasan and Mingming (2006), has considered the role of international finance in growth, but has not analysed the role of financial development in foreign direct investment (FDI). In addition, a number of researchers have different views. For instance, Loayza and Ranciere (2001) found that the financial system could cause economic recessions because financial crises

would often lead to economic slowdowns. Financial development played a positive role in the Taiwanese economy while it expressed a negative role in the Korean and Japanese economies (Liu and Hsu, 2006). Therefore, this paper attempts to clarify the role of financial development in growth by looking at the Vietnamese provincial panel data evidence for 61 provinces during the period 1997-2004.

Published empirical studies about this relationship in Vietnam have the following major problems. Although there have been a series of studies about the role of finance in economic growth in Vietnam, there have not been papers which analyse systematically using econometric tools at each level of the whole country or province. Previous authors, such as Hien (1994), Hideto (1997), Harvie and Hoa (1997), Duc (1998) and Ruth (2002), mainly employed qualitative methods to analyse the relationship. A small number of authors such as Duong and Izumida (2002) studied this relationship at the microfinance level, carrying out a micro-econometric analysis of a household survey. This study was conducted for just three provinces, Ninh Binh, Quang Ngai and An Giang with only a very small sample of 300 households surveyed. This might lead to a biased conclusion since the sample might not represent the whole country. Therefore, it is necessary to clarify the relationship in the case of Vietnam by looking at some additional channels of transmission from financial development to economic growth, constructing and using some new measures. Within this context, this paper builds an indicator to measure the efficiency of using savings, ISOR.[5]

This paper also addresses the indirect impact of financial development on growth through three main channels: the efficiency of using savings, the quantity and the quality of investment, and productivity. In addition, the progress of information technology, and the quantity and the quality of FDI are the indirect influences of financial development on growth, are considered in this paper.

The findings suggest that an increase in the level of financial development accelerates the efficiency of using savings, the total productivity, capital and efficiency of investment, leading to growth in Vietnam. Financial development also has an indirect effect on the efficiency of investment by improving the information technology which helps to decrease the problem of asymmetric information. In addition, the channel of transmission from financial development to growth is mainly through accelerating the quantity of FDI rather than the quality.

This paper presents a qualitative assessment of the impacts of financial development on growth and sources of growth in Vietnam in section 2. Section 3 show how to model the impact of financial development on growth, and then employs the data collected to run the model to give the estimated results and discussion. I conclude this paper in section 4.

2. Overview of the impact of financial development on growth and sources of growth in Vietnam

2.1. The impacts on growth

Financial intermediation has played a key role in the Vietnamese economy[6]. The financial sector has been increasing its contribution to GDP. The share of the financial sector in GDP increased from 0.8% in 1986 to 2.4% in 1996. The growth rates of the financial sector were high during the period 1986-1996. Moreover, by using the simple relationship, any improvement in financial development has had strong influence on economic growth in

Table 1: Fund Mobilization by the Banking System in the Period 1991 -2005

(Unit: %)

Year	Growth rate	As compared with GDP	As compared with gross savings
1991	100	18.1	119.9
1992	195	15	88.2
1993	113.8	13.8	55.4
1994	159.4	17.7	69.4
1995	166.7	23	84.9
1996	120.7	25	89.6
1997	128.1	28	103.7
1998	137	21	88
1999	163	30	133
2000	144	39	131
2001	124	44	142
2002	116	48	143
2003	127	52	151
2004	125	65	182
2005	132	77	210

Note: The rate of growth is calculated in nominal terms, which equals the nom inal value of the current year mobilized funds divided by the nominal value of the previous year mobilized funds; gross savings equals national savings plus foreign savings and equals gross investment.

Source: World Bank (1996), Vietnam Economic Times, N o.1, 1998 and Reviews 1997, No.12 945) , IMF (2002, 2006).

1998-2005[7].

Intuitively, financial development could influence economic growth in Vietnam because it would improve the mobility of savings, and investment in terms of both the quality and the quantity and productivity. This will be analysed in the following sections.

2.2 The impact on savings mobilization

Savings mobilization increased very quickly since financial liberalization in 1988 (see Table 1). It increased annually by 47.3% over the period 1992-1997 and 33.5% over the period 1998-2005 on average. Funds mobilized as a percentage of GDP also increased sharply from 18.1% in 1991 to 77% in 2005. Funds channelled to the banking system were almost lower than the gross savings of the economy in the period 1991-1998, but larger than those in 1999-2005.

In general, the economy had not mobilized all savings over the period 1991-1998. For example, only 40% of savings were mobilized in 1995. The remainder of savings were stored in the form of gold, precious metals, real estate and foreign currencies[8], due to the low level of financial development. Specifically, state owned commercial banks issued bonds to mobilize funds. These banks mobilized 3,806 billion dong in this manner (Hideto, 1997 and Vietnam Economic Review No.12, p.22, 1997). However, these mobilized funds were short term since bonds issued were short-run in

Table 2: Long Term Loans and Foreign Currency Loan in the Period 1989 -1996

Unit: billion VND

Year	1989	1990	1991	1992	1993	1994	1995	1996
Long run loan	850	1,390	1,553	2,530	5,730	7,719	13,661	15,618
% of total loan	21.35	24.34	15.45	16.76	24.72	27.96	32.99	30.79
Growth rate (%)		63.53	11.73	62.91	126.48	34.71	76.98	14.33
Short run loan	3,132	4,320	8,489	12,563	17,450	19,902	27,742	35,101
% of total loan	78.65	75.66	84.55	83.24	75.28	72.04	67.00	69.21
Growth rate (%)		37.93	96.50	47.99	38.89	14.05	39.39	26.53
Total loans	3,982	5,710	10,051	15,093	23,180	27,621	41,403	50,719
Growth rate (%)		43.39	76.02	50.16	53.58	19.16	49.89	22.50
Foreign currency loan	661	842	1,715	3,543	4,869	5,493		
% of total loan	16.60	14.74	17.06	23.47	21.01	19.89		
Growth rate (%)		27.38	103.68	106.59	37.43	12.82		

Note: The data in 1994 is at the end of September 1994.
Source: OECF (1996), Mori (1997) and calculated from their data.

mature. This is due to the lack of a secondary market or the underdeveloped financial system. Fortunately, the financial sector has improved since then. The stock market has operated since 2000. Tools for mobilizing funds have been increasing. The financial market has been more open and hence there is a higher level of financial development, leading to an improvement in savings mobilization.

2.3 The impact on investment

2.3.1. The impacts on the quantity of investment

Both short term and long term loans increased sharply from 1989 to 1996 as shown in Table 2. The rate of growth in long term loans went up more than that of short term loans in spite of the dominance of the latter. The share of foreign currency loans was fairly big and increased over this period. This was good for economic growth. However, the high ratio of foreign currency loans is a result of the low level of domestic savings. Many businessmen borrowed from abroad through deferred payment on purchases of foreign goods, typically in the Minhphung/Epco case. This kind of borrowing led to difficulties for the banking system because these borrowers could default, and hence threatened growth.

The share of long term loans was very low in the banking system during 1989-1996 (see Table 2). The ratio of long term loans/total loans was 21.35% in 1989 and 30.79% in 1996 meanwhile that ratio of short term loans was 78.65% in 1986 and 69.21% in 1996. This was one of the obstacles for long term investment and, hence, for growth between 1989 and 1996. The low level of financial development leading to asymmetric information is the best explanation for this.

All banks depend on their evaluation of collateral rather than the prediction of the borrowers' ability to repay when assessing loans. Specifically, all banks require firms to have collateral when they borrow because banks found it hard to evaluate borrowers. Banks evaluated the value of collateral assets at a discounted level (around 50%) and lent only 80% of the discounted value of collateral assets (Viet, 1997). This was a waste of capital since banks faced an excess of funds (in mid-1996, around 2,800 billion VND) while firms were short of funds. If Vietnam had had a good

Table 3: Credit Operation during the Period 2002 -2005

Year	Unit	2002	2003	2004	2005
Total liabilities	Billion VND	456,288	577,514	711,494	890,596
Total funds mobilized	Billion VND	293,587	364,249	444,096	561,025
Total loans	Billion VND	281,450	364,407	460,597	554,363
Non-performing loans	Billion VND	20,355	17,545	13,122	17,618
Growth rate in funds mobilized	%	22.76	24.07	21.92	27.43
Growth rate in loans		30.39	27.96	26.20	20.09
- State owned enterprises	%	21.00	25.80	26.00	21.50
- Non-state enterprises		38.14	35.37	32.82	37.13
Loans to state owned enterprises as a percentage of total loans	%	65.52	54.2	45.9	43.3
Loans/liabilities	%	61.61	62.69	64.74	62.16
Long term loans/Total loans	%	43.50	44.60	43.30	42.30
Non-performing loans/Total loan s	%	7.23	4.80	2.84	3.17
Market share of loans by banking institutions					
- State owned banks	%	78.08	78.62	74.36	70.96
- Joint venture banks, foreign banks		8.57	8.13	8.91	9.44
- Joint stock banks		9.00	11.00	12.00	15.00

Source: SBVN (2006)

financial market, especially a stock market, this problem would have been resolved since banks would have been able to diversify risks and investment opportunities by buying financial assets exempt from accelerating inflation. In turn, firms would have also been able to borrow by issuing bonds or shares to finance their investments. Therefore, long-term loans would have increased more easily and hence growth would have improved.

Table 3 shows that the loan structures have been improved. The growth rate of loans was fairly high (26.2% per annum) between 2002 and 2005. The ratio of long-term loans/total loans has improved resulting from the operation of the stock market from 2000. This ratio occupied more than 42 percent in total loans. The loan growth rate has been higher in the private sector than in the state sector. Loans to state-owned enterprises as a percentage of total loans decreased from 65.5% in 2002 to 43.3% in 2005. This shows that the serious problem of moral hazard in the state sector has declined gradually. There is a good trend in the financial sector. Competition has been become stronger in the banking system. Market share of state-owned banks has been reduced from 78.1% in 2002 to 70.9% in 2005 while that of private banks has increased, especially joint stock banks. Joint venture banks and foreign banks have increased their market share from 8.6% in 2002 to 9.4% in 2005. Joint stock banks have also increased their market share from 9% in 2002 to 15% in 2005. This means that the better level of financial development has improved fund allocations and hence growth during the period 2002-2005.

2.3.2. The impact on the quality of investment

The smaller ISOR and ICOR[9] give more efficiency to mobilize and use capital, since

Table 4: ICOR and ISOR of Vietnam, 1989 -2005

Year	Investment/GDP	GDP growth	ICOR	Savings/GDP	ISOR
1989	11.2	8.0	1.4		
1990	12.9	5.1	2.5		
1991	17.6	6.0	2.9		
1992	21.0	8.6	2.4		
1993	27.0	8.1	3.3		
1994	30.9	8.8	3.5		
1995	35.1	9.5	3.7	119	1.3
1996	37.2	9.3	4.0	15.9	1.7
1997	27.6	8.8	3.1	19.8	2.3
1998	28.7	5.8	4.9	19.1	3.3
1999	19.0	4.8	3.9	26.5	5.5
2000	29.6	6.7	4.4	31.7	4.7
2001	31.2	6.8	4.6	33.2	4.9
2002	33.2	7.04	4.7	32.0	4.5
2003	34.6	7.3	4.7	29.7	4.1
2004	35.5	7.7	4.6	31.7	4.1
2005	36.6	8.4	4.4	32.2	3.8
Average 1989-1999		7.5	3.2		2.8
Average 2000-2005		7.3	4.5		4.35

Note: ICOR = (Investment/GDP)/GDP growth; ISOR = (Savings/GDP)/GDP growth. These indicators are calculated by the author.

Source: World Bank (1994, 1995, 1997b, 1998a, 1998b, 1999b), IMF (2003)
IMF (2006) and the Vietnamese government website: http://www.chinhphu.vn

the economy needs less savings or investment in order to obtain the same percentage of growth. Normally, a higher level of financial development creates a lower ISOR and ICOR. CIE (1997) suggested that the better efficiency of the financial sector in Vietnam strongly improved the competitiveness of Vietnam's industry and commercial enterprises. The financial sector helped the successful restructuring of the industrial sector and others in the Vietnamese economy. Thus, this promoted growth.

Table 4 shows that the Vietnamese economy has been one of the fastest growing countries in the South East Asia since it carried out its renovation policy with low ICOR and ISOR. The average rate of growth has been more than 7.5% in the period 1989-1999 and 7.3% in the period 2000-2005. The average ICOR and ISOR was 3.0 during the period 1989-1999 and 4.4 during the period 2000-2005. Meanwhile ICOR was 4.3, 5.8, 4.4, 4.3 and 3.9 in Thailand, Philippines, Korea, Malaysia and Indonesia respectively between 1978 and 1996[10]. This is because the better level of financial development has helped Vietnam to release constraints on self-finance for investment, eliminating credit rationing to the state budget and enterprises. In addition, the development of the financial sector in Vietnam has improved the ability of the private sector and households to access loans from the banking system. The low ICOR and ISOR

means that Vietnam has reached a high rate of growth originating from a more intensive use of existing production capacity as much as from the creation of new production capacity (Jansen, 1997).

However, both ICOR and ISOR have increased over the period (see Table 4). The Asian financial crisis was the worst time for mobilizing and using capital since ISOR was 5.5 in 1999 and ICOR was 4.9 in 1998, highest in the period 1989-2005. The efficiency of investment and productivity have been improved but there are still problems because of the low level of financial development and monopoly (Leung, 1996). The financial sector has remained rudimentary so that information collected has been limited. This led to wrong forecasts for future actions in the years, 1996 to 1998. Over-investment between 1996 and 1998 in real estate, steel, sugar, cement and construction materials is evidence of this poor forecasting as it caused a big surplus in the market resulting in deflation for the economy from 1999 to 2000.

Another problem was that bad loans in the banking system were very high during the period 1996-2001[11]. This is because Vietnam has a serious problem of asymmetric information in which lenders have found it very hard to evaluate borrowers' financial situations and the efficiency of their investing projects due to bad accounting and auditing system. In addition, state owned banks have been sometimes forced to lend to poorly performing state owned enterprises. Thus, the problem of moral hazard has been serious in the state sector. Furthermore, corruption in the banking system such as in the Namdinh Textile Union, Tamexco and Minh phung/Epco cases, also contributed to the large number of bad loans. Normally, borrowers have to pay a kickback of 6.5% to bank brokers in order to borrow from banks. The more borrowers pay, the higher the chance of getting loans. Thus, bankers have given loans to bad borrowers in many cases. Finally, crop failures forced farmers to delay loan payments (World Bank, 1997). Fortunately, there has been a reduction in bad loans since 2002. The ratio of non-performing loans to total loans went down (3.17%) in 2005 (see Table 3). This is perhaps the reason why the efficiency of loans has been improved.

3. Modelling the impact of financial development on growth and sources of growth in Vietnam

3.1. Model for estimation

Most studies (Romer, 1986; Roubini and Sala-i-Martin, 1992; King and Levine, 1993) used the model structure of the AK type to analyse the impact of financial development on growth and sources of growth. Based on these studies, the following estimation model is built to estimate the relationship in the case of Vietnam.

$$Y_i = \alpha + \beta X_i + e_i$$

where Y_i includes the growth rate; the incremental savings output ratio (ISOR); rate of capital growth; the growth rate of the incremental investment output ratio (ICOR); the information technology measured by the number of telephones per person; and productivity growth for province i. X_i includes the indicator of financial development, namely the credit to the economy as a percentage of GDP and the number of financial companies per million population; the indicator to measure the openness of the economy, the rate of export plus imports to GDP; initial real GDP per capita; education; government consumption; inflation; and FDI. The error term is e_i.

This model has the following four differences from models used in the existing literature. Firstly, it captures the role of international finance in economic development. Secondly, including FDI in the model helps to identify which channel, the quantity or the quality of FDI or both, financial development has a more indirect influence on economic growth. Thirdly, it identifies two additional channels, savings and investment, through which financial development can influence the efficiency of savings and the efficiency of investment. Finally, the influence of information technology is another channel through which financial development can affect the efficiency of investment since better information technology can help reduce the problem of asymmetry. This is because lenders are able to know more about borrowers. More importantly, it captures the characteristics of the Vietnamese economy more appropriately. This is because the contribution of FDI to economic growth is very meaningful. FDI had a significant role in domestic savings, gross national investment, foreign exchange earnings, and national budget and hence economic growth (Mai, 2000). FDI was positively related to technological spillover effects and thus productivity (Thuy, 2007).

3.2. Data and proxies

This paper studies the relationship between financial development and growth using data from 61 Vietnamese provinces over the period 1997-2004. The dataset is constructed from a variety of sources: the General Statistical Office of Vietnam, newspapers, internet and reports from the State Bank of Vietnam. However, data for 2004 are available only in a few provinces. There are many missing values. Outliers and missing values are removed from the sample in each regression.

Productivity is derived from a simple production function as follows: $Y = AK^{\alpha}L^{1-\alpha}$.

Dividing both sides by $K^{\alpha}L^{1-\alpha}$ yields:

$$\text{productivity} = \frac{Y}{K^{\alpha}L^{1-\alpha}}.$$

King and Levine (1993) took the values of between 0.2 and 0.4 for their experiment and found that there were no important influences in their results. Hence, they chose their results with equal to 0.3. Following King and Levine (1993) and Beck et al. (2000), it is assumed that is 0.3.

ICOR and ISOR[12] are used as measures of savings and investment efficiency in which they are calculated by the savings and investment/GDP ratio divided by the annual rate of GDP growth. Smaller ICOR and ISOR factors, hence, indicate more efficient investment and savings. The indicator, ISOR, is built to see the efficiency of using savings for growth.

Because of the problem of data availability, provincial savings is calculated as follows:

$$\text{Provincial savings} = \frac{\textit{National savings}}{\textit{National GDP}} \text{ provincial GDP}$$

The number of telephones per population is used to proxy for information technology.

3.3. Estimation results and discussion

To deal with the problem of endogeneity, regional dummies, education, population, labour, lags of inflation and openness are employed as instrumental variables.

The estimated results in tables between 5 and 10 show that financial development not only has a direct impact but also indirect impact on growth. Financial development con-

tributes to growth through accelerating efficiency of using savings, the level and quality of investment, technology, and productivity.

3.3.1. The impacts on growth

Consistent with Levine (1997, 1999), the results reported in Table 5 show that coefficients of financial development are statistically significant. All coefficients have positive signs. This means that the relationship between financial development and growth is positive. Moreover, the positive impact of FDI on growth is clear since the coefficient of FDI is positively significant in equation 3. This confirms that FDI is an important determinant of growth.

It would be interesting to disentangle the impacts of financial development on volume and quality of FDI in these results. Since financial development can capture its indirect impact on growth through encouraging FDI, if the coefficient of financial development increases so much when FDI is included in the regression equation, then it can be concluded that the main channel of transmission from financial development to growth is the volume of FDI. In order to do this, equations 1 and 3 are used. The coefficient of financial development increases enormously (100%) if FDI is included in the model. Thus, it is concluded that the impact of financial development on growth is mainly through increasing the quantity of FDI.

Inflation is positively significant at 1 percent. It appears that inflation encourages

Table 5: The effects of financial development on growth
(Number of financial companies per million population)

	Panel data				**Panel data (GLS)**	
	1 (RE)	2 (IV-RE)	3 (RE)	4 (IV-RE)	5	6
Constant	-23.339***	-37.108**	-22.717**	-26.168*	-22.249***	-22.540***
	(0.003)	(0.012)	(0.016)	(0.074)	(0.000)	(0.007)
Number of financial companies	0.021	0.223**	0.042**	0.166*	0.031**	0.053***
	(0.239)	(0.032)	(0.042)	(0.090)	(0.021)	(0.001)
Initial real GDP per capita	1.024**	1.756**	0.851	1.057	0.794**	0.646
	(0.033)	(0.022)	(0.124)	(0.155)	(0.018)	(0.00150)
Schooling	0.672***	0.034	0.195*	0.008	0.513***	0.207**
	(0.001)	(0.765)	(0.067)	(0.943)	(0.001)	(0.038)
Government expenditure	0.013	0.036**	0.013	0.025	0.011	0.008
	(0.162)	(0.030)	(0.212)	(0.104)	(0.131)	(0.369)
Inflation	0.133***	0.145***	0.152***	0.152***	0.159***	0.179***
	(0.000)	(0.003)	(0.000)	(0.005)	(0.000)	(0.000)
Openness	0.126	0.171	0.070	0.146	0.250***	0.215*
	(0.352)	(0.302)	(0.627)	(0.352)	(0.000)	(0.053)
FDI			0.0003*	0.0002		0.0001
			(0.072)	(0.286)		(0.311)
Hausman test (p-value)	0.1653		0.3693			
Wald test for heteroscadasticity (p-value)						
Sargan test (p-value)		0.5193		0.4133		
Serial correlation test (p-value)		0.9099		0.6761		
Overall R_square	0.2144		0.2477			
Observations	219	218	160	159	219	160

Note: *** is significant at 1 percent, ** is significant at 5 percent and * is significant at 10 percent.
P-values are in brackets.

growth during the period 2000-2004. This may be because the Vietnamese economy had suffered deflation and very low inflation[13] after the Asian financial crisis in late 1997, due to weak demand. Therefore, inflation promoted growth during that time. The negative correlation between inflation and growth could reflect simply that inflation has been a proxy of financial repression (Gregorio, 1995). Based on this argument, inflation has been a proxy for financial liberalization in the case of Vietnam. That is reasonable since Vietnam has been carrying out its financial liberalization since 1988.

3.3.2. The impact on efficiency of using savings

It has been argued that financial development has a positive effect on the efficiency of using savings. This is because financial development gives good investment advice and information, and provides a variety of financial services to savers. I tested this hypothesis and found that financial development indicator was significant at 5% and has the expected sign in Table 6. This leads to the conclusion that financial development increases efficien-

Table 6: The effects of financial development on saving efficiency (ISOR)
(Number of financial companies per million population)

	Panel data				Panel data (GLS)	
	1 (FE)	2 (IV-FE)	3 (FE)	4 (IV-FE)	5	6
Constant	0.105***	0.106***	0.102***	0.053	0.185***	0.167***
	(0.000)	(0.000)	(0.000)	(0.126)	(0.000)	(0.000)
Number of financial companies	-0.001***	-0.005**	-0.001***	-0.004**	-0.0001*	-0.0002**
	(0.000)	(0.039)	(0.000)	(0.025)	(0.061)	(0.033)
Initial real GDP per capita					-0.005***	-0.005**
					(0.002)	(0.026)
Schooling	-0.011***	-0.011**	-0.012***	-0.010**	-0.001	-0.001
	(0.000)	(0.024)	(0.004)	(0.036)	(0.208)	(0.365)
Government expenditure	1.05E-05	0.0002	-0.00002	0.0001	-0.0001***	-0.0001**
	(0.886)	(0.294)	(0.845)	(0.642)	(0.002)	(0.015)
Inflation	-0.0003	-0.0003	-0.0002	0.0002	-0.001***	-0.0004*
	(0.157)	(0.443)	(0.424)	(0.549)	(0.006)	(0.071)
Openness	-0.001	-0.001	-0.001	-0.001	-0.001***	-0.001**
	(0.407)	(0.818)	(0.401)	(0.593)	(0.009)	(0.044)
FDI			-6.81E-08	5.63e-07		-2.14E-07
			(0.921)	(0.523)		(0.749)
Hausman test (p -value)	0.0002		0.0019			
Wald test for heteroscadasticity (p -value)	0.0000		0.0000			
Sargan test (p -value)		0.5475		0.1161		
Serial correlation test (p-value)		0.4967		0.5351		
Overall R_square	0.0238		0.0316			
Observations	245	245	184	187	245	184

Note: *** is significant at 1 percent, ** is significant at 5 percent and * is significant at 10 percent. P-values are in brackets . Turnover of financial companies/ provincial GDP is used as a measure of financial development in IV-FE.

cy of using savings for economic growth in Vietnam.

3.3.3. The impacts on investment

Financial development and FDI fosters capital growth since these coefficients are positively significant (see Table 7). While FDI shows a slight impact on capital growth, financial development presents a very strong influence on capital growth. This confirms the strong positive effects of financial development on capital growth. This reflects how Vietnam has been successfully encouraging foreign investment, especially FDI, since the late 1980s. FDI has contributed to capital growth during the period 1995-2006 and played an important role in growth (Nguyen, 2006).

It is not surprising that financial development strongly improves the efficiency of investment since the estimated coefficient is negatively significant (see Table 8). However, government expenditure and education caused deterioration in the efficiency of investment during the

Table 7: The effects of financial development on capital growth
(Credit to the economy as a percentage of GDP)

	Panel data				Panel data (GLS)	
	1 (FE)	2 (IV-FE)	3 (FE)	4 (IV-FE)	5	6
Constant	56.090* (0.058)	56.415* (0.057)	60.287* (0.066)	63.891* (0.084)	157.423** (0.042)	213.289** (0.013)
Credit to the economy	1.199*** (0.000)	1.401 (0.357)	1.0201*** (0.003)	3.541** (0.021)	0. 610*** (0.000)	0. 727*** (0.001)
Initial real GDP per capita					-7.692 (0.113)	-11.016** (0.039)
Schooling	1.561 (0.612)	1.448 (0.650)	3.344 (0.0.362)	1.399 (0.745)	0. 545 (0.619)	0.380 (0.781)
Government expenditure	-0.204 (0.369)	-0.227 (0.424)	- 0.307 (0.253)	-0.447 (0.154)	- 0.080 (0.447)	0.048 (0.680)
Inflation	-0.476** (0.025)	-0.481** (0.025)	-0.657*** (0.001)	-0.697*** (0.002)	-0.293 (0.132)	-0.392** (0.033)
Openness	-0.483 (0.916)	-0.360 (0.938)	1.236 (0.767)	3.085 (0.523)	0. 758 (0.661)	1.182 (0.462)
FDI			0.002** (0.027)	0.001 (0.205)		0.002** (0.050)
Hausman test (p -value)	0.0197		0.0901			
Wald test for heteroscadasticity (p - value)	0.000		0.000			
Sargan test (p -value)		0.9468		0.6350		
Serial correlation test (p - value)		0.0009		0.1927		
R_square	0.0420		0.0500			
Observations	392	392	262	262	392	262

Note: *** is significant at 1 percent, ** is sign ificant at 5 percent and * is significant at 10 percent. P - values are in brackets.

Table 8: The effects of financial development on ICOR growth
(Number of financial companies per million population)

	Panel data				Panel data (GLS)	
	1 (Pooled OLS)	2 (2SLS)	3 (Pooled OLS)	4 (2SLS)	5	6
Constant	-288.812***	-229.635**	-265.530**	-221.012*	-288.812***	-270.320**
	(0.001)	(0.011)	(0.018)	(0.068)	(0.001)	(0.013)
Number of financial companies	-0.426**	-0.980***	-0.378*	-0.782**	-0.426**	-0.362*
	(0.016)	(0.003)	(0.077)	(0.045)	(0.013)	(0.081)
Initial real GDP per capita	16.049***	14.069***	13.869**	12.146*	16.049***	13.547**
	(0.000)	(0.010)	(0.012)	(0.086)	(0.000)	(0.011)
Schooling	0.631	4.684**	0.897	6.166**	0.631	0.718
	(0.429)	(0.040)	(0.351)	(0.032)	(0.421)	(0.447)
Government expenditure	0.264**	0.236**	0.236*	0.224*	0.264**	0.230*
	(0.018)	(0.017)	(0.094)	(0.084)	(0.016)	(0.092)
Inflation	0.360	0.083	0.427	0.217	0.360	541
	(0.533)	(0.884)	(0.527)	(0.756)	(0.526)	(0.413)
Openness	-1.413	-1.620	-1.906	-1.277	-1.413	-1.142
	(0.267)	(0.131)	(0.181)	(0.296)	(0.258)	(0.446)
FDI			0.001	-0.0004		-0.0003
			(0.472)	(0.713)		(0.858)
Hausman test (p-value)	0.8292		0.3096			
Wald test for heteroscadasticity (p-value)	0.9691		0.5085			
Sargan test (p-value)		0.7464		0.6975		
Serial correlation test (p-value)		0.0539		0.3596		
R_square	0.116		0.108			
Observations	224	224	167	167	224	167

Note: *** is significant at 1 percent, ** is significant at 5 percent and * is significant at 10 percent. P-values are in brackets.

period 2000-2004. This is because the economy had weak demand in the period and the government had a lot of credit programs in order to increase the demand. The source of credit was very cheap with easy borrowing conditions, which provided abundant credit without carefully appraising the efficiency of investment.[14] In addition, corruption could have led to the inefficiency of investment.

The use of loan/GDP as another measure of financial development shows that the estimated coefficient of FDI is positively significant. This means that there has been inefficiency with using the FDI in the Vietnamese economy. The reason is that the government has introduced a policy of import substitution and thus has maintained the very high rate of protection. All protected industries have become inefficient and provided low returns to the economy. They have not been competitive in the world market. For instance, fifteen FDI automobile assembly ventures were approved and eight moved on to operation. However, the market in Vietnam is too small for the automobile assembly to have high returns. These investments have been inefficient and wasteful of FDI (World Bank, 1999).

3.3.4. The impacts on information technology

The evidence from Table 9 shows the best estimation results with expected signs and significant coefficients. All coefficients are positively significant at 1 percent except FDI and inflation. Both tables indicate that a 1 percent increase in the level of financial development can improve information technology by around 0.0005 percent, other things being equal. The positive correlation between financial development and information technology supports the hypothesis that financial development can positively affect the efficiency of investment, hence growth, by reducing the problem of asymmetric information. This also reflects that the financial system has been faced with a problem of providing timely and accurate data for risk management. This is because the financial system had not been able to control the integrity of data due to the underdeveloped and substandard information technology systems. Thus, growth in information technology has largely contributed to the

Table 9: The effects of financial development on information technology
(Credit to the economy as a percentage of GDP)

	Panel data				**Panel data (GLS)**	
	1 (FE)	2 (IV-FE)	3 (FE)	4 (IV-FE)	5	6
Constant	-0.482***	-0.391	-0.642***	-0.447**	-0.672***	-0.692***
	(0.000)	(0.278)	(0.000)	(0.032)	(0.000)	(0.000)
Credit to the economy	0.0002	0.012***	0.001**	0.012***	0.0004***	0.0005***
	(0.147)	(0.009)	(0.044	(0.006)	(0.002)	(0.008)
Initial real GDP per capita					0.039***	0.039***
					(0.000)	(0.000)
Schooling	0.044***	0.034	0.057****	0.042**	0.010***	0.012***
	(0.000)	(0.291)	(0.000)	(0.039)	(0.000)	(0.000)
Government expenditure	0.0004***	-0.001	0.001***	-0.001	0.001***	0.001***
	(0.000)	(0.119)	(0.002)	(0.217)	(0.000)	(0.000)
Inflation	-0.00004	-0.0002	0.00002	-0.0001	-6.31E-08	5.82E-06
	(0.689)	(0.655)	(0.847)	(0.803)	(1.000)	(0.965)
Openness	0.013***	0.001	0.014***	-0.002	0.010***	0.009***
	(0.000)	(0.928)	(0.000)	(0.854)	(0.000)	(0.000)
FDI			-1.38E-06	5.94e-08		7.58E-07
			(0.120)	(0.983)		(0.405)
Hausman test (p-value)	0.0002		0.0000			
Wald test for heteroscadasticity (p-value)	0.0000		0.0000			
Sargan test (p-value)		0.1629		0.8319		
Serial correlation test (p-value)		0.000		0.0012		
R_square	0.1573		0.1118			
Observations	389	389	257	257	389	257

Note: *** is significant at 1 percent, ** is significant at 5 percent and * is significant at 10 percent. P-values are in brackets.

Table 10: The effects of financial development on productivity growth
(Number of financial companies per million population)

	Panel data				Panel data (GLS)	
	1 (Pooled OLS)	2 (2SLS)	3 (Pooled OLS)	4 (2SLS)	5	6
Constant	27.241*	22.357	32.651**	28.628*	27.241**	32.65**
	(0.051)	(0.101)	(0.041)	(0.063)	(0.045)	(0.034)
Number of financial companies	0.058*	0.141***	0.076**	0.149***	0.058**	0.076**
	(0.052)	(0.008)	(0.025)	(0.008)	(0.046)	(0.020)
Initial real GDP per capita	-2.087***	-1.724***	-2.641***	-2.191***	-2.087***	-2.641***
	(0.004)	(0.009)	(0.002)	(0.003)	(0.003)	(0.001)
Schooling	0.435	0.260	0.942	0.862*	0.435	0.942**
	(0.200)	(0.497)	(0.021)	(0.075)	(0.191)	(0.017)
Government expenditure	-0.006	0.004	0.001	0.012	-0.06	0.001
	(0.710)	(0.816)	(0.946)	(0.564)	(0.705)	(0.944)
Inflation	0.054	0.041	0.065	0.030	0.054	0.065
	(0.582)	(0.696)	(0.528)	(0.792)	(0.574)	(0.516)
Openness	0.638***	0.619***	0.475*	0.460**	0.638***	0.475*
	(0.007)	(0.004)	(0.071)	(0.041)	(0.005)	(0.061)
FDI			0.0003	0.0003		0.0003
			(0.330)	(0.312)		(0.316)
Hausman test (p -value)	0.4872		0.9870			
Wald test for heteroscadasticity (p-value)	0.5298		0.9729			
Hansen test (p -value)		0.9042		0.3163		
Serial correlation test (p-value)		0.0840		0.2318		
R_square	0.112		0.199			
Observations	197	196	155	196	197	155

Note: *** is significant at 1 percent, ** is significant at 5 percent and * is significant at 10 percent . P-values are in brackets.

efficiency of the financial system, leading to improvement in the efficiency of using funds mobilized for investment.

3.3.5. The impacts on productivity

The coefficient of financial development is very significant as shown in Table 10. Alternative measures of financial development used show similar results. This indicates that financial development has a positive impact on productivity growth. This is because economic agents in Vietnam are financially constrained. An increase in loans to these agents could lead to an improvement in productivity since these agents would be able to have investment for advanced technology and skilled labour.

4. Conclusion

The methods of pooled OLS, fixed and random effects, IV-regressions, and GLS in panel data are used to examine the impact of financial development on growth in Vietnam through four main channels: savings, productivity, investment, and efficiency of invest-

ment. In all estimations, it is found that financial development has strong positive effects on growth, the efficiency of using savings, the total productivity, the capital accumulation and the efficiency of investment in the case of Vietnam. Financial development has a positive role in improving the efficiency of investment through increasing the level of information technology, which can reduce the level of asymmetric information. Unlike the previous studies, I analyse an additional factor of international finance affecting growth and find that the role of international finance is also important to growth. International finance plays a positive role in growth through improving productivity, the efficiency of using savings and capital accumulation. The indirect impact of financial development on growth is mainly through increasing the quantity of FDI. This is perhaps the reason why there is no evidence showing the role of international finance in the efficiency of investment.■

Notes:

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1. There are additional measures of financial development in King and Levine (1993): DEPTH: Liquid liabilities of the financial system divided by GDP; Bank: bank credit divided by bank credit plus central bank domestic assets; PRIVY: credit to private sector divided by GDP.

2. Real per capita GDP growth, real per capita capital growth and productivity growth.

3. Turnover ratio, for instance, measured by total value of shares traded divided by the value of shares listed on stock exchanges.

4. Market capitalization/GDP.

5. ISOR is the incremental investment output ratio.

6. Based on data calculated from World Bank (1997).

7. The quarterly data from GSO is employed to show the simple relationship between financial development and growth.

8. Vietnam Economic Time No.1, 1998.

9. ISOR is the incremental saving output ratio. ICOR is the incremental investment output ratio. See table 4 in the appendix for more detal.

10. Data for South East Asian Countries calculated from Corsetti (1998).

11. Non-performing loan/total loans in Vietnam: 1996: 9.3%, 1997: 12.4%, 1998: 12%, 1999: 12.1%, 2000: 9.7%, 2001: 8.5% (IMF, 2002, 2003).

12. ICOR = Incremental capital output ratio. ISOR = Incremental saving output ratio.

13. The inflation rate in Vietnam: 1998: 8.6%; 1999: -0.2%; 2000: -0.5%; 2001: 0.7%; 2002: 4.0%; 2003: 2.9%; 2004: 9.5% (IMF, 2002 and 2006).

14. Consistent with Rioja and Valev (2002)'s argument.

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