

## **EFFECTS OF FINANCIAL FACTORS ON INVESTMENT IN EMERGING ECONOMIES: AN EMPIRICAL ANALYSIS**

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### **ABSTRACT**

*This paper examines the effects of financial factors on investment in a cross-sectional sample of 22 emerging market economies for the period 1995-2004. Our findings reveal a positive relationship between financial indicators (credit to private sector, total liquid liabilities and credit by banks) and gross investment. In case of private investment, only the credit to private sector indicator displayed a positive relationship. Our results also confirm existing theoretical and empirical evidence on the role of several non-financial factors on investment. The findings provide strong support for the argument that financial development enhances domestic investment in emerging market economies. We conclude that emerging market economies can make significant gains in growth and development by setting policies that rightly target financial sector development.*

**Keywords:** *emerging market economies, financial factors, gross and private investment*

**JEL Classifications:** *E22, E62, F21, G24*

### **I. INTRODUCTION**

The financial sector is now regarded as a fundamental component of modern market led economies and its contribution to economic growth and development has been sufficiently documented. A common message that can be discerned from the literature focusing on finance-growth links is that, the financial sector generally has beneficial effects on development of the real sector. However, at the same time, the validity of this largely common view has been scrutinized both theoretically (McKinnon, 1973; Shaw, 1973; Galbis, 1977; Greenwood and Smith, 1997 and Levine, 1997) and empirically (Patrick, 1966; Fritz, 1984; Jung, 1986; Odedokun, 1996; Choe and Musa, 1999; and Ndikumana, 2000). In additions, to these works, Gertler (1998) and Thakor (1996) provide a good survey of the theoretical literature on finance growth link while Levine (1997) provides a thorough review of both theoretical and empirical studies.

Despite the theoretical and empirical tests, the role and importance of financial system in a country's growth and development process has conflicting views from some of the pioneers in economics. For example, Hicks (1969) argued that the financial system played a critical role

in pushing industrialization in England through the mobilization of capital for immense works. On the other hand, Lucas (1988) has noted that economists badly overstress the role of financial factors in economic growth. Such views lead one to realize that there is still an acute need for further research so as to get a sharper feel and understanding of the development of financial markets and institutions and its critical role in the growth process.

Prominent economists have in recent times, signaled the need for a better understanding of the financial sector. For example, Stiglitz (1989) argued that “there seems to be an almost universal under-appreciation of the importance of the role played by financial institutions in our society”. Levine (1997) in his review of the finance-growth nexus concluded that “there is not sufficient understanding of long-run growth until the evolution and functioning of the financial systems are understood and that much more research on financial development is needed.” The importance of financial sector in a country’s development process has further been emphasized in recent times. For example, in a collection of essays that explores the future of development economics against the background of the past half century of development thought and practice, Gerald Meier has argued that “it will be especially important to achieve a better understanding of the evolution of financial institutions in the process of a country’s development,” (Meier, 2001, p. 32).

Given the above views expressed by prominent economists and pioneering researchers, we attempt in this article to provide additional evidence into the financial sector’s role on investment and growth in emerging economies. However, our study has a slightly different focus in contrast to existing literature. Existing theoretical and empirically oriented studies have largely focused on the relationship between the development of financial intermediaries and economic growth, for example, Fry (1988), Levine (1993), Levine and Zervos (1998), Saint-Paul (1992), King and Levine (1993) and Lee (1996).

As noted by Levine (1997) in his theoretical framework, one of the primary roles of the financial system is to *mobilize savings* (Figure 1 in Levine, 1997) that can be invested. Through investment, capital gets accumulated and finally contributes to growth. It is this investment component that we consider to be important. Our focus follows the theoretical reasoning of Levine (1997) who argues that the financial sector facilitates the channeling of resources from savers (Figure 1 in Levine, 1997), to investment activities with positive returns and increases the availability of investment funds which in turn eases possible liquidity constraints. Thus, our specific focus here is to look at the relationship between financial factors and investment. Given the close connection between the level of investment and the rate of growth as documented in several studies (Kormendi and Meguire, 1985; Khan and Reinhart, 1990; Barro, 1991; among many others), we consider it worthwhile to examine the financial factors that influence domestic investment.

The objective of this paper is to provide some empirical evidence on the financial determinants of level of domestic investment in a cross-sectional sample of 22 emerging market economies for the period 1995-2004. To test the effect of financial factors on investment, we use four financial indicators: credit provided by banks, credit to the private sector, total liquid liabilities and claims on government.

We chose emerging market economies as our case study for several reasons. First, studies that address the link between financial factors and investment are rare in the emerging market

economies literature. Second, since 1995 many countries in the emerging market category have moved towards a market led economy and opened up their financial sectors. The gradual deregulation of financial markets in emerging markets has enabled both intermediaries and capital markets to grow. Third, data availability post 1995 for several of the emerging market economies leads us to make at least a modest start in investigating the importance of financial factors in domestic investment.

The rest of the paper is organized as follows. Section two presents some data on investment and financial sector development in emerging market economies. A discussion of variable choice and theoretical justification is presented in section three. Section four describes the data and estimation method while section five presents the empirical results. Concluding remarks are presented in section six.

## II. SOME PATTERNS IN INVESTMENT AND FINANCIAL DEVELOPMENT

Table 1 presents macroeconomic data on emerging market growth and investment trends in early and late 1990s. In terms of output growth, almost all emerging market economies in our sample recorded positive growths with average growth rate of more than three percent. Nine of the twenty-two countries recorded increases in their GDP growth rates during the 2000-04 period compared to 1995-99 period. While positive real growths were maintained,

**Table 1**  
**Macroeconomic Indicators**

Country	Real GDP growth rate (%)		Gross domestic investment (% of GDP)		Inflation–GDP deflator (%)	
	95-99	00-04	95-99	00-04	90-94	95-99
Argentina	6.8	2.3	19.5	18.8	505.1	0.8
Brazil	1.5	2.2	19.4	19.7	1667.2	19.4
Chile	7.3	5.5	22.7	24.2	17.5	6
China	10.8	8.8	31.5	34.8	10.4	5.2
Colombia	4.3	1.4	17.8	19.6	26.6	18.3
Egypt	3.6	5.4	20.2	17.9	14.1	7
Hong Kong	5.3	2.2	27.5	30.3	9.3	4
India	4.8	6.5	22.2	22.8	10.2	8.9
Indonesia	8.0	1.6	27.0	26.4	8.6	20.5
Israel	6.5	4.0	22.5	21.8	14.3	8.2
Hungary	-3.2	3.3	19.8	22.2	25.5	18.8
Malaysia	9.3	5.1	37	35.6	3.8	3.9
Mexico	3.9	2.8	18.8	19.1	16.3	24.5
Philippines	1.9	3.6	22.3	22	11.1	7.9
Poland	1.1	5.7	17.7	22.7	149.5	16.4
Singapore	9.4	5.9	33.3	36.1	2.9	1.0
Korea, Republic	7.6	4.9	37.1	33.3	7.0	4.4
Peru	2.8	3.8	17.7	23.3	1607.4	8.4
South Africa	0.2	2.3	16.4	15.9	12.5	7.3
Thailand	9.0	1.4	40.1	31.7	4.8	5.1
Turkey	3.7	3.9	24.3	24.3	73.7	80.7
Venezuela	4	0.6	18.2	16.9	41.0	53.8
Average	4.1	3.5	24.4	24.5	201.7	17.2

Source: Author's calculations from World Development Indicators CD ROM, 2005 (The World Bank, 2005)

many of the countries experienced dramatic reduction in their inflation, with several economies aiming towards maintaining price stability, particularly in the latter part of 1990s. For example, nineteen of the twenty-two countries, saw their inflation rates fall in the 2000-04 period compared to the 1995-99 period. Throughout the 1990s, average gross domestic investment was stable around twenty-four percent of GDP. The point to note is that average domestic investment across the emerging market economies was maintained at an almost constant level with no significant increases. However, twelve of the twenty-two countries showed increases in investment in the 2000-04 period compared to 1995-99 period.

Table 2 captures the trend of selected financial indicators for the subject emerging market economies. The supply of credit to private sector, availability of total liquid liabilities and credit by the banking sector, increased in several of the emerging market economies during 1990s. For example, seventeen of the twenty-two countries registered increases in credit to the private sector and total liquid liabilities during the 2000-04 period compared to the 1995-99 period. In fifteen countries, credit by the banking sector increased in the 2000-04 period compared to the 1995-99 period. Such patterns captured by the financial indicators confirm the fast pace of development of the financial sector in these emerging market economies. These trends are also a reflection of financial liberalization as well as outward oriented financial policies that several of the emerging market economies have implemented.

**Table 2**  
**Financial Indicators**

Country	Credit to private sector (% of GDP)		Total liquid liabilities (% of GDP)		Credit by banking sector (% of GDP)		Claims on government (% of GDP)	
	95-99	00-04	95-99	00-04	95-99	00-04	95-99	00-04
Argentina	16.4	20.0	15.3	26.0	26.1	30.9	10.0	10.9
Brazil	59.6	35.0	50.1	30.5	106.5	46.1	57.7	17.7
Chile	49.0	54.4	40.3	46.2	64.8	66.6	15.8	4.8
China	90.5	88.4	92.0	124.4	93.5	109.6	3.0	5.1
Colombia	31.1	34.6	31.6	34.2	35.0	40.9	2.0	4.5
Egypt	28.7	37.0	87.9	82.9	90.3	89.3	59.6	39.0
Hong Kong	146.0	155.2	171.4	189	137.5	152.7	-8.5	-12.4
India	24.6	23.0	45.0	48.0	50.1	46.6	24.1	21.5
Indonesia	47.9	53.5	42.3	54.0	47.1	56.1	-1.3	6.0
Israel	61.1	69.7	70.1	86.5	91.9	83.2	28.6	8.0
Hungary	34.5	22.3	47.5	43.3	98.7	66.9	64.8	44
Malaysia	93.5	124.4	88.8	123.5	98.6	148.6	2.4	-0.03
Mexico	27.4	29.3	27.1	30.2	39.7	34.0	4.6	4.5
Philippines	27.4	45.1	42.5	63.3	36.9	73.3	7.6	17.4
Poland	9.5	11.9	33.5	37.8	33.1	35.2	23.5	17.8
Singapore	98.5	106.8	122.4	116.7	74.6	87.5	-23.9	-27.0
Korea, Republic	64.9	64.7	61.5	83.5	65.7	80.5	0.08	0.01
Peru	11.6	16.4	20.0	28.0	13.8	19.4	2.0	-4.0
South Africa	109.5	119.3	42.2	42.9	120.9	142.7	2.0	2.8
Thailand	101.9	139.8	79.6	98.7	104.0	149.3	0.02	-0.01
Turkey	17.2	18.5	26.8	38.8	23.8	38.2	6.7	15.3
Venezuela	23.0	11.8	38.5	23.1	34.0	21.5	8.0	4.2
Average	51.3	56.2	57.0	64.3	66.1	71.6	13.4	8.6

Source: Author's calculations from World Development Indicators CD ROM, 2005 (The World Bank, 2005)

### **III. VARIABLE CHOICE AND THEORETICAL JUSTIFICATION**

One of the earliest formal theoretical frameworks that relates to investigation of the role of the financial sector in economic development process was set by McKinnon (1973). He contended that a positive causation runs from the financial sector to economic development. At the same time, the work of Shaw (1973) was also consistent with the view expressed by McKinnon (1973). Later, Galbis (1977) provided a more rigorous formal framework of likely effects of financial liberalization on economic growth. In recent times, a theoretical functional approach to understanding the role of financial systems in economic growth has been thoroughly unfolded by Levine (1997). In his theoretical model of finance-growth relationship (Figure 1, Levine, 1997), specific market frictions motivate the emergence of financial contracts, markets and intermediaries and that these financial arrangements provide five financial functions that affect savings and allocations decisions in ways that influence economic growth. In our analysis here, we take a step back and focus on the discussion of theoretical issues within a finance-investment nexus rather than finance growth-nexus.

The role of credit as a factor determining a country's investment level has been a subject of academic inquiry for a while. The earliest attempt was by Keynes (1937) whose exposure of credit and its links with a states investment was followed by the works of Gurley and Shaw (1955). These authors linked nations economic growth directly to financial sector and its growth and development. Shaw (1973) together with the work of McKinnon (1973) extended this line of work further and presented a theoretical as well as an empirical focus of the links between monetary factors and a country's levels of investment. One of the prominent outcomes of these author's work was the McKinnon-Shaw hypothesis: that in the low-income countries, a positive association is possible between investment and real money balances.

The McKinnon-Shaw model has been the basis of several studies that focused on monetary variables and investment link. In recent times, researchers have expanded the McKinnon-Shaw theoretical developments much further. For example, Greenwood and Smith (1997) have argued that financial sector has an important role in facilitating investment capital to areas where returns are high. Works by Gertler (1988), Pagano (1993) and Levine (1997) provides further interesting insights. These authors contend that financial intermediaries have a special vital functions within the financial sector: alleviating information problems, reducing liquidity risk, reducing monitoring costs and channeling credit to certain class of borrowers that cannot access non-intermediated forms of credit.

There is a rich literature on the above subject. Rather than providing another review, in this section, we focus on the theoretical arguments related to our chosen variables. See for example, Gertler (1988, Thakor (1996), and Levine (1997) for a comprehensive review of the theoretical and empirical literature dealing with the links between financial indicators and growth.

#### **Growth Rate of Output**

The theoretical argument from a neoclassical perspective is that the growth rate of real output is positively associated with investment as it indicates the changes in aggregate demand for output that investors seek to meet. Several researchers have provided empirical support of this notion, for example, Wai and Wong (1982); Greene and Villanueva (1991); and Fielding

(1993 and 1997). Domestic as well as foreign investment is essentially attracted by robust domestic *economic growth*, indicating that the economic conditions are right for production. This, therefore, acts as a positive signal for investors. A growing economy also offers greater opportunities for investors to realize economies of scale. The stability of a host country's economic environment plays an important role in its policy formulation. Sustained economic growth indicates the extent to which economic policies, rules of conduct and institutions of the host economy favors production. An economy with infrastructure that favors production encourages individuals to engage in creation and transaction of goods and services that lead to increased investment and output growth. Likewise, an economy whose economic policies and rules change frequently could signal an unstable economic environment. Such negative signal could deter potential investors.

### **Interest Rate**

Investment is negatively related to interest rate. Higher interest rate reduces the attractiveness of new investment projects, which do not have high enough returns. The theoretical argument from a neoclassical perspective is that high interest rates (lending) increase the user cost of capital and so reduces investment. However, in contradiction, the McKinnon-Shaw hypothesis establishes a positive relationship between interest rate and investment but interest rate in question is the deposit interest rate. Higher interest rates on deposits will attract more real balances, which allow them to finance more investment. On the other hand, low or negative real interest rates discourage savings, which reduce the amount of funds available for investment. Although these arguments are perfectly valid, in modern market economies, it is the investment with borrowed funds that is likely to have a significant impact. For example, businesses make investments in physical capital, such as, machines, as long as they expect to earn more from the physical capital than the interest cost of a loan to finance the investment. When interest rate is high, few investments in physical capital will earn more than the cost of borrowed funds, so planned investment lending is low. When the interest rate is low, many investments in physical capital will earn more than the interest cost of the borrowed funds. Therefore, when interest rates are lower, business firms are more likely to undertake an investment in physical capital, and planned investment spending will be higher. Thus, the neoclassical argument makes more sense in market economies and so our choice of interest rate (lending) fits in well with emerging market economies where investments are large and funded by borrowed funds.

### **Availability of Liquid Liabilities (M3)**

The effects of money on economic activities within a neo-classical growth model were first shown by Tobin (1965). Theoretically, the role of money is simply regarded as passive: it is simply to finance a certain level of transaction of goods or services.

The theoretical Keynesian argument is that an expanded supply of money in circulation increases the availability of loanable funds. This can aid economic growth as more liquidity in the banking sector encourages borrowing, which then gets invested. A supply of loanable funds in excess of demand leads to lower interest rates. Because private investment is assumed to be inversely related to prevailing interest rates, businesses will expand their investments as interest rates fall and credit becomes more available. More investment in turn raises aggregate demand,

leading to a higher level of economic activity. However, increasing monetization requires the promotion of banking and credit institutions, which in turn helps promote investment as well as savings and growth.

### **Credit by Banking Sector**

A country's financial system is an integral component of the general economic system. Thus, the role of organized financial intermediaries is important, as they are able to mobilize private savings and efficiently allocate them to their most productive uses. The banking sector is a critical ingredient in the promotion of long-term investment and economic growth. Banks supply medium and long-term funds that are needed for the creation or expansion of the industrial base. Financing by banks has strong advantages in monitoring firms in early stages of industrialization, but the supply of bank credit depends crucially on the quality of the legal system (Levine, 1998). The bank lending channel is based on the view that banks play a special role in the financial system because they are especially well suited to deal with certain types of borrowers, especially small firms (Mishkin, 1995). A contractionary monetary policy that decreases bank reserves and deposits will have an impact through its effects on borrowers (Mishkin, 1995).

### **Credit to Private Sector**

Availability of credit to private sector is thought to positively influence private investment as well as overall gross domestic investment. Many emerging markets were more open in the 1990s. During this period most emerging economies embarked on wholesale privatization of state owned industries, liberalization of financial markets as well as lifting of restraints on marketing and distribution. This shift in economic development policies signaled recognition by concerned governments of the importance of the private sector. Access to private capital through efficient financial markets appears to be an important determinant of investment and growth in developing economies.

### **Government Consumption**

Government consumption is one of the variables whose correlation with overall growth is identified as fragile by Levine and Renelt (1992). On the other hand, Easterly and Rebelo (1993), find that the share of public investment in transport and communication is robustly correlated with growth. Infrastructure spending appears to raise the social return on ongoing investment, rather than spurring further efforts (Temple, 1999). In the case of investment, government consumption can "crowd out" domestic investment by raising interest rates, reducing the pool of loanable funds in the market and by increasing distortionary taxation on investment activities. It is also possible for government consumption to "crowd in" domestic investment. Borrowing from the domestic financial system is another way government can reduce investment. Collier and Gunning (1999) noted that regulated credit markets and institutional environments that favor governments establish borrowing privileges for the government as well as government entities. This in turn reduces access to credit by private investors. Poor management practices can make governments bad debtors as they fail to meet their debt obligations.

### **Inflation Rates**

According to the Solow growth accounting formula, high rates of inflation reduce productivity growth if they reduced investment in physical and human capital or if they reduced the rate of technological change. High and unstable inflation rates affect investment by increasing the degree of uncertainty about countries macroeconomic fundamentals. As a result firms have no incentive in pursuing long-term and illiquid investment projects. Financial intermediaries also react to high inflation by avoiding long-term lending. Investment projects that are likely to have deeper impact on the economy are usually large and long-term duration. If funding is unavailable for such projects, investment would be adversely affected.

Inflation can influence growth by changing the distribution of income in a manner that raises the rate of savings and investment in the economy. Ghatak (1995, p.104) notes that there are two main ways in which this can occur: unanticipated inflation (resulting in a shift of income between wage earners and profit earners) and operations of inflation tax (shift in distribution of income towards the government). If investors display higher propensities to save and invest than do wage earners, the ratio of overall savings and investment in the economy will rise and growth will be favorably affected.

Research by McKinnon (1973) and Shaw (1973) focus on ways inflation can have an adverse effect on the level and quality of capital formation. Two of their aspects deserve attention: First is the effect of inflation on intermediation activities of the banking system. The banking system forms an important intermediary function by collecting deposits from individuals and making loans for productive investment. Anything, which reduces the volume of real bank deposits, will tend to reduce those types of investment, which are too large to be financed by individuals from their own resources. The second is the willingness of people to accumulate money holdings prior to buying capital goods. Savings may be held in currency or bank deposits. It is known that inflation acts as a deterrent to holding money, particularly for long periods of time.

High inflation increases the uncertainty of future returns from investment. A higher rate of inflation than expected would reduce the real cost of borrowing, and a lower rate of inflation than expected would increase the real cost of borrowing. Thus, by increasing uncertainty, high inflation could reduce investment; the resulting lower growth in the capital-to-labor ratio would thus reduce productivity growth (Taylor, 1996).

### **IV. DATA AND METHODOLOGY**

All the data were sourced from the 2001 issue of the World Bank's World Development Indicators CD ROM. The time period covered was 1995-2004 for estimation of gross investment equations. In this category, the sample of emerging market economies totaled 22 and included Argentina, Brazil, Chile, China, Colombia, Egypt, Hong Kong, India, Indonesia, Israel, Hungary, Malaysia, Mexico, Philippines, Poland, Singapore, Korea Republic, Peru, South Africa, Thailand, Turkey and Venezuela. Estimation of the effects of financial factors on private investment included 16 countries for the 1995-2004 periods. These countries were Argentina, Brazil, Chile, China, Colombia, Egypt, India, Indonesia, Malaysia, Philippines, Poland, Korea Republic, Peru, South Africa, Thailand, and Venezuela. The estimable equations are represented by equations (1) to (4) followed by variable measures.



$$ginv_{it} = \alpha_0 + \alpha_1 ginv_{it-1} + \alpha_2 gdp_{it-1} + \alpha_3 in_{it-1} + \alpha_4 irl_{it-1} + \alpha_5 gc_{it-1} + \alpha_6 cps_{it-1} + \varepsilon_{it} \quad (1)$$

$$ginv_{it} = \beta_0 + \beta_1 ginv_{it-1} + \beta_2 gdp_{it-1} + \beta_3 in_{it-1} + \beta_4 irl_{it-1} + \beta_5 gc_{it-1} + \beta_6 m3_{it-1} + \varepsilon_{it} \quad (2)$$

$$ginv_{it} = \chi_0 + \chi_1 ginv_{it-1} + \chi_2 gdp_{it-1} + \chi_3 in_{it-1} + \chi_4 irl_{it-1} + \chi_5 gc_{it-1} + \chi_6 cbs_{it-1} + \varepsilon_{it} \quad (3)$$

$$ginv_{it} = \delta_0 + \delta_1 ginv_{it-1} + \delta_2 gdp_{it-1} + \delta_3 in_{it-1} + \delta_4 irl_{it-1} + \delta_5 gc_{it-1} + \delta_6 cg_{it-1} + \varepsilon_{it} \quad (4)$$

where:

*ginv* = gross capital formation as a percent of GDP.

*gdp* = GDP growth rate in percent.

*in* = GDP deflator inflation (percent).

*irl* = interest rate lending (percent).

*cg* = claims on government as a percent of GDP.

*gc* = general government consumption as a percent of GDP.

*cps* = credit to private sector as a percent of GDP.

*m3* = liquid liabilities (M3 as a percent of GDP).

*cbs* = credit by banking sector as a percent of GDP.

$\varepsilon$  = random error term.

*i* = country.

*t* = time period.

We also replicate equations (1) to (4) with private fixed investment (*pinv*), measured as a percent of gross domestic fixed investment, as our second dependent variable.

To test the effects of financial factors on gross and private investment, we used four different indicators. These indicators are credit to private sector as a percent of GDP, total liquid liabilities (M3) as a percent of GDP, credit by the banking sector as a percent of GDP, and claims on government as a percent of GDP. We also control for selected non-financial variables (*GDP*, *INF*, *IRL*, and *GC*) so as to minimize model miss-specification.

All sample data is pooled for all equations. Although, pooling has its own limitations as a result of fundamental variations in country structures, the sample countries selected here have a range of similar characteristics when it comes to financial indicators and investment as revealed by data in section 2. It is worth mentioning that due to the nature of the data (a combination of the cross-section and time series data), it is likely that the regression disturbances would be heteroskedastic, as well as autoregressive. For this reason, a variation of the generalized least square is the chosen method used in the present case. Assuming that the error terms follow a first order autoregressive scheme, a full cross-sectionally correlated and time-wise autoregressive model is estimated (see Kmenta, 1986).

We estimate several equations. First we investigate the effects of financial factors on gross investment. Following this, we test the effect of financial factors on private investment. Our empirical estimations included several equations with successive additions of financial indicator variables, holding lagged investment and growth common across all equations. We also include some control variables so as to dampen any possible problems of omission of relevant variables.

**Table 3**  
**Effects of Financial Factors on Gross Investment**

<i>Variables</i>	<i>Hypothesized sign</i>	<i>Equation 1</i>	<i>Equation 2</i>	<i>Equation 3</i>	<i>Equation 4</i>
<i>Constant</i>	(+)	7.573 (8.129)*	7.131 (7.686)*	6.689 (7.190)*	8.442 (7.910)*
<i>ginv<sub>t-1</sub></i>	(+)	0.621 (13.740)*	0.644 (14.240)*	0.672 (15.630)*	0.642 (14.810)*
<i>gdp<sub>t-1</sub></i>	(+)	0.182 (3.788)*	0.162 (3.514)*	0.166 (3.450)*	0.148 (2.915)*
<i>cps<sub>t-1</sub></i>	(+)	0.016 (3.013)*	...	...	...
<i>m3<sub>t-1</sub></i>	(+)	...	0.014 (2.700)*	...	...
<i>cbs<sub>t-1</sub></i>	(+)	...	...	0.00825 (1.635)***	...
<i>cg<sub>t-1</sub></i>	(+)	...	..	...	-3.523 (3.118)*
<i>N</i>		220	220	220	220
<i>Buse R<sup>2</sup></i>		0.66	0.67	0.65	0.65
<i>F</i>		138.93	143.94	133.08	132.92
<i>Durbin-h</i>		0.69	0.51	0.25	0.66

*Note:* t-statistics are in parentheses.

\*, \*\*, and \*\*\* indicates statistically significant at the 1, 5 and 10% levels respectively.

## V. DISCUSSION OF RESULTS

Before providing a discussion of results, we wish to point out the overall robustness of results in Tables 3 to 6. The robustness and adequacy of all equations were gauged against some diagnostic statistics turned out to be satisfactory for models utilizing cross-sectional data. These included Engle's conditional test on residuals that did not reveal any serious heteroscedasticity problems, no evidence of autocorrelation in the residuals as revealed by the Durbin-h test and the Jarque Bera test for normality revealed little evidence to suggest rejecting the null hypotheses. Given the use of pooled data, the results are considered to be highly satisfactory. First, the F-Statistics is established as statistically significant across several equations. This led to a conclusion that there exists a strong statistical relationship between the predictor variables and the criterion variable at alpha 0.05 level. Second, The goodness of fit, as measured by the *Buse R<sup>2</sup>* can be considered to be highly satisfactory, in particular, taking into account the fact that a low explanatory power is common in pooled cross-section time-series regressions.

A major problem encountered was the inter-related effects among a number of financial indicators. To rectify this we tested each of the financial indicators separately. Our correlation matrix of coefficients confirmed absence of overlapping effects once tested individually. Several of the coefficients are statistically significant at the 1- percent level. A number of estimated

coefficients are statistically significant for all country categories. The signs of the regression coefficients have several implications as discussed below.

**Table 4**  
**Effects of Financial and Macroeconomic Factors on Gross Investment**

<i>Variables</i>	<i>Hypothesized sign</i>	<i>Equation 1</i>	<i>Equation 2</i>	<i>Equation 3</i>	<i>Equation 4</i>
<i>Constant</i>	(+)	9.581 (8.046)*	9.194 (7.735)*	9.086 (7.749)*	9.727 (7.652)*
<i>ginv<sub>t-1</sub></i>	(+)	0.589 (12.780)*	0.613 (13.360)*	0.626 (14.310)*	0.615 (14.160)*
<i>gdp<sub>t-1</sub></i>	(+)	0.181 (3.757)*	0.176 (3.645)*	0.178 (3.724)*	0.148 (2.816)*
<i>in<sub>t-1</sub></i>	(-)	-0.0100 (1.645)***	-0.010 -1.599	-0.012 (2.071)**	-0.0125 (1.822)**
<i>irl<sub>t-1</sub></i>	(-)	-0.0031 (0.970)	-0.003 (0.967)	-0.0029 (0.908)	-0.0039 (1.155)
<i>gc<sub>t-1</sub></i>	(-)	-0.063 (1.764)***	-0.06 (1.701)***	-0.073 (2.107)**	-0.0022 -0.015
<i>cps<sub>t-1</sub></i>	(+)	0.0159 (2.857)**	...	...	...
<i>m3<sub>t-1</sub></i>	(+)	...	0.012 (2.123)**	...	...
<i>cbs<sub>t-1</sub></i>	(+)	...	...	0.102 (1.938)**	...
<i>cg<sub>t-1</sub></i>	(+)	...	...	..	-4.164 (3.389)*
<i>N</i>		220	220	220	220
<i>Buse R<sup>2</sup></i>		0.68	0.67	0.68	0.66
<i>F</i>		75.25	72.67	74.3	69.65
<i>Durbin-h</i>		0.88	0.56	0.41	1.08

*Note:* t-statistics are in parentheses.

\*, \*\*, and \*\*\* indicates statistically significant at the 1, 5 and 10 % levels respectively.

The results in Tables 3 and 6 provide evidence on the direct effects of the four main financial variables on gross investment and private investment respectively. With regard to gross investment (Tables 3 and 4), three of the financial variables have the theoretically expected positive signs on their coefficients and statistically significant. The results of credit to private sector, total liquid liabilities and credit by banking confirm their positive influence on emerging markets gross investment. The results of these variables strongly confirm that an increase in credit to private sector, an increase in total liquid liabilities and an increase in credit by the banking sector certainly leads to higher gross domestic investment.

Tables 5 and 6 present results of the effects of the financial factors on private investment. Only credit to private sector is found to have the expected positive sign on its coefficient. However, the coefficient of credit to the private sector variable is statistically insignificant suggesting a weak effect only. Although, the result of this variable is weak, it does suggest that the financial system in the sample of emerging market economies is liquid and credit to the private sector is certainly suitable for higher private investment.

**Table 5**  
**Effects of Financial Factors on Private Investment**

<i>Variables</i>	<i>Hypothesized sign</i>	<i>Equation 1</i>	<i>Equation 2</i>	<i>Equation 3</i>	<i>Equation 4</i>
<i>Constant</i>	(+)	38.111 (10.520)*	41.51 (10.830)*	38.956 (10.470)*	38.584 (11.560)*
<i>pinv<sub>t-1</sub></i>	(+)	0.456 (9.596)*	0.436 (9.164)*	0.461 (9.938)*	0.445 (9.604)*
<i>gdp<sub>t-1</sub></i>	(+)	0.027 (0.264)	0.0823 (0.783)	0.033 (0.316)	0.0612 (0.633)
<i>cps<sub>t-1</sub></i>	(+)	0.0034 (0.229)	...	...	...
<i>m3<sub>t-1</sub></i>	(+)	...	-0.03 (1.435)	...	...
<i>cbs<sub>t-1</sub></i>	(+)	...	...	-0.011 (0.807)	...
<i>cg<sub>t-1</sub></i>	(+)	...	...	...	-5.262 (2.125)*
<i>N</i>		144	144	144	144
<i>Buse R<sup>2</sup></i>		0.40	0.40	0.41	0.42
<i>F</i>		30.78	31.16	32.89	34.31
<i>Dubin-h</i>		2.6	2.14	2.4	2.08

*Note:* t-statistics are in parentheses.

\*, \*\*, and \*\*\* indicates statistically significant at the 1, 5 and 10 % levels respectively.

Theoretically, we would have expected a stronger effect of financial variables on private investment as several studies have noted the positive influence of the private sector in growth and development. The findings here, however, suggest that it is the gross investment that is most dependent on financial development in the emerging market economies. This result obtained here suggests it is consistent with our sample countries. Several of countries in our sample moved towards a market led economy in recent times. Our sample data is also for a short period, that is, post 1995. This is also the time most economies opened up. In several countries, the financial markets are still underdeveloped as compared to the financial markets of high-income countries. Banks are largely the sources of internal finance. So the results obtained are not surprising.

Our choice of variable measures also plays a crucial effect in terms of the results obtained. Data limitations have led us to use highly aggregate measures. Disaggregated data may have produced better results. For example, with the opening up of several economies and flow of consumer goods would have meant diversion of financial resources towards both private and public consumption, thus limiting spending on investment goods. Therefore, it is quite likely that part of credit by the banking sector would have been used to finance consumption.

**Table 6**  
**Effects of Financial and Macroeconomic Factors on Private Investment**

<i>Variables</i>	<i>Hypothesized sign</i>	<i>Equation 1</i>	<i>Equation 2</i>	<i>Equation 3</i>	<i>Equation 4</i>
<i>Constant</i>	(+)	34.609 (8.450)*	38.644 (8.609)*	35.154 (8.521)*	34.334 (8.418)*
<i>pinv<sub>t-1</sub></i>	(+)	0.463 (0.567)	0.439 (9.156)*	0.462 (9.612)*	0.476 -0.773
<i>gdp<sub>t-1</sub></i>	(+)	0.060 (0.567)	0.079 (0.764)	0.067 (0.638)	0.0818 (0.773)
<i>in<sub>t-1</sub></i>	(-)	-0.023 (0.889)	-0.0308 (1.189)	-0.023 (0.891)	-0.022 (0.773)
<i>irl<sub>t-1</sub></i>	(-)	-0.0010 (0.226)	-0.00185 (0.397)	-0.0017 (0.386)	-0.0017 (0.391)
<i>gc<sub>t-1</sub></i>	(-)	0.248 (1.809)***	0.16 (1.148)	0.279 (2.028)**	0.177 (1.312)
<i>cps<sub>t-1</sub></i>	(+)	-0.317 (0.00032)	...	...	...
<i>m3<sub>t-1</sub></i>	(+)	...	-0.019 (0.903)	...	...
<i>cbs<sub>t-1</sub></i>	(+)	...	...	-0.0108 (0.766)	...
<i>cg<sub>t-1</sub></i>	(+)	...	...	...	-4.06 (1.588)
<i>N</i>		144	144	144	144
<i>Buse R<sup>2</sup></i>		0.41	0.39	0.42	0.44
<i>F</i>		15.63	14.99	16.27	18.06
<i>Durbin-h</i>		2.69	2.28	2.53	2.16

Note: t-statistics are in parentheses.

\*, \*\*, and \*\*\* indicates statistically significant at the 1, 5 and 10 % levels respectively.

The results obtained by the claims on government variable also deserve emphasis. In all equations tested, both for gross and private investment, the coefficient carries a negative and statistically significant coefficient. The results confirm heavy government borrowings. The negative effect of government borrowing on investment suggests that government borrowing may be used to finance government consumption rather than investment.

Tables 3 to 6 also control for several non-financial factors. Of essential factors are past investment and growth, both of which are found to exert positive influence. The coefficient of lagged investment indicate its stronger effect as confirmed by its the statistical significance across several equations in Tables 3-6. The results overall confirm that higher investments and growth today induces higher investment in future. Inflation is found to be negatively related to investment. This reduces investment as it induces some degree of uncertainty on macroeconomic fundamentals, erodes the purchasing power and raises the cost of capital. As predicted by theory, there is evidence of the negative effect of government consumption on gross investment. It can be said with high degree of certainty that government consumption may be “crowding out” gross domestic investment by reducing the pool of funds in the markets. However, evidence of negative effect of government consumption on private investment is absent. In all equations, interest rate is found to carry a negative sign on its coefficient but statistically insignificant. Results of the interest rate variable, although not so robust, nevertheless confirm the neoclassical theoretical argument that high interest rates (lending) increase the user cost of capital and reduces investment.

## **VI. CONCLUDING REMARKS**

The central focus of this paper is to examine the effects of financial factors on gross and private investment in emerging market economies in the post 1995 period. The relationship between financial factors and investment was tested using four financial indicators: credit to private sector, total liquid liabilities of the financial system, credit by banks and claims on government.

A positive relationship between financial development and gross investment was confirmed by three financial indicators: credit to private sector, total liquid liabilities and credit by banks. In case of private investment, it is the credit to private sector that confirmed a positive relationship. Overall the results for financial factors are much stronger for gross investment than private investment. The results obtained here provides sufficient confirmation that in the emerging market economies, high levels of financial development contributes to higher levels of gross investment.

The role of several non-financial factors on investment is confirmed. Past investment and growth induces higher investment in future. High inflation, interest rate lending and government are found to be negatively related to investment, all consistent with existing theoretical arguments.

The results here add another dimension to the existing literature that addresses the relationship between financial sector, investment and growth. The results of this study clearly indicate that financial sector facilitates overall investment and growth. For the emerging market economies, the evidence here indicates that development of the financial sector will certainly encourage higher investment. Emerging market economies can gain by setting policies that rightly target development of the financial sector as well as putting macroeconomic fundamentals right.

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