



*40<sup>th</sup> Anniversary Celebrations  
4 Decades of Pride*

## **XXXVIth Annual Monetary Studies Conference**



### **Capital Market Development and Saving-Investment Correlation in the Caribbean**

**Dr. Sunday Osaretin Iyare  
Dr. Brian M. Francis  
Troy Lorde**

**Central Bank of Trinidad & Tobago  
Conference Facilities, 16th Floor  
November 1-4, 2004**

# **Capital Market Development and Saving-Investment Correlation in the Caribbean**

**Sunday Osaretin Iyare (Ph.D.)**  
**Senior Lecturer**  
**Department of Economics**  
**and**  
**Director of Solar Energy Management**  
**University of the West Indies**  
**Cave Hill Campus, P.O. Box 64**  
**Bridgetown, St. Michael, Barbados**

**and**

**Brian M. Francis (Ph.D.)**  
**Lecturer**  
**Department of Economics**  
**University of the West Indies**  
**Cave Hill Campus, P.O. Box 64**  
**Bridgetown, Barbados**

**and**

**Troy Lorde**  
**Assistant Lecturer**  
**Department of Economics**  
**University of the West Indies**  
**Cave Hill Campus, P.O. Box 64**  
**Bridgetown, Barbados**

**October 2004**

### **Abstract**

This paper examines saving-investment correlations in five Caribbean countries; namely, Grenada, Guyana, Jamaica, St. Vincent and the Grenadines, and Trinidad and Tobago, using annual time series data for the period 1977-1999. The paper utilises an empirical model which has its origin in the work of Feldstein and Horioka (1980). Our results, though tentative, suggest that countries with relatively developed primary equity markets have larger saving investment correlations.

## **Introduction**

In recent years, renewed efforts at capital market development in the Caribbean region have sparked debate about the importance of capital markets and challenges facing the region. Central issues in this debate have been the institutional infrastructure; the utilisation of evolving innovation information technology; the importance of adequate levels of domestic savings; the existence of wide disparities in interest rates, exchange rates, and inflation rates; and the acceptance of a credit culture. There is consensus that greater convergence in the above issues is important for the development of a truly regional capital market.

In this paper, we shall focus on saving-investment correlations in the Caribbean. Empirical studies of saving-investment correlations have shown the following results: Feldstein and Horioka (1980) found that the cross-section saving-investment correlation for OECD countries is high and concluded that the finding implies capital immobility; Dooley et al. (1987), Wong (1990), and Vamvakidis and Wacziarg (1998) show with data from developing countries that the estimated coefficient of saving on investment is lower or close to zero which has the implication of perfect capital mobility among developing countries; and Kasuga (2004) concluded that “countries with developed primary equity markets have larger saving-investment correlations....The influence of financial systems on the estimation can explain lower saving-investment correlations in developing countries, most of which have bank-based and/or relatively inefficient financial sector.”

In the present paper we offer further insights into the fundamental question that countries with developed primary equity markets have larger saving-investment correlation by using a sample of Caribbean countries. The sample consists of countries chosen from among three broadly classified groups: countries with relatively developed primary equity markets (Barbados,

Jamaica, and Trinidad and Tobago); countries with primary equity markets in their infant stages of development (The Bahamas, Belize, and Guyana); and countries without developed primary equity markets (The OECS countries of Antigua and Barbuda, Dominica, Grenada, Montserrat, St. Kitts and Nevis, St. Lucia, and St. Vincent and the Grenadines). Given the abundance of weaknesses associated with Feldstein and Horioka (1980) in particular, and other studies in general (documented in section 2), our paper is only an initial attempt at empirically investigating the saving-investment correlation within the context of Caribbean economies, and must therefore be seen in that light.

Notwithstanding the above observation, the present paper differs from most others in the literature in two fundamental ways. First, most previous empirical studies focused on developed and developing countries but few studies involved countries from the Caribbean. Second, most of the previous studies employed cross-sectional and panel data in their empirical analyses. This current paper uses annual time series data for individual countries selected arbitrarily from the three groups discussed earlier based on our perception of the level of development of their respective equity markets.

The plan of the paper is as follows. Section two provides a brief summary of the literature pertaining to the saving-investment correlations with specific emphasis on the limitations of previous studies. The third section discusses the specification of the econometrics model to be estimated for all the countries selected in the study. The fourth section presents the data and empirical results. Summary and conclusion are presented in the final section.

### **Summary of the Saving-Investment Correlation Literature**

A fairly large body of literature deals with the issue of the saving-investment correlation from both theoretical and empirical perspectives. Logically, to exhaustively survey this body of

literature in any single undertaking is virtually impossible. In fact, such an exercise is far beyond the scope of our study. Indeed, it would be meaningless to re-invent the wheel. Against this backdrop, the presentation in this section of our study borrows from Moosa (2004), Schneider (1999), and Vamvakidis and Wacziarg (1998). The discussions focus specifically on some of the empirical difficulties associated with previous studies. This, because a fairly reasonable exposition on the theoretical underpinnings of the saving-investment correlations can be found in the papers identified above. We consider this approach worthwhile since one must first understand the problems and limitations of other studies in order to determine the nature and extent of the contribution that can be made to the further development of the existing literature on the saving-investment correlation.

Some of the more important problems associated with previous studies on the saving-investment correlations, identified by Moosa (2004), Schneider (1999), and Vamvakidis and Wacziarg (1998) include: (1) missing variables and the use of averages; (2) biased estimates due to the endogeneity of savings, which arises from misspecification caused by omitted variables and/or simultaneous equation bias; (3) failure to account for differences across countries with respect to size, structure, and institutions; (4) inability to incorporate policy changes such as the removal of capital controls; and (5) the issue of nonstationarity of the variables in the model, which, if exists, could produce spurious correlation.

### **Specification of the Econometrics Model**

Following Kasuga (2004), we propose the following econometrics model to be estimated:

$$\left(\frac{I}{Y}\right)_i = \beta_0 + \beta_1 \left(\frac{S}{Y}\right)_i + \varepsilon_i \quad (1)$$

where  $(I/Y)_i$  is the ratio of gross domestic investment to GDP in country  $i$ , and  $(S/Y)_i$  is the corresponding ratio of gross domestic saving to GDP, and  $E_i$  is the error term. To correct for potential problems arising out of the possible endogeneity of domestic savings, the past saving rate is used as an instrument.

In terms of the working of the model, the theoretical argument follows from Kasuga (2004), who hypothesises that the coefficient of  $(S/Y)$  reflects the impact of an increase in net worth on investment. He bases his thesis on the idea that informational asymmetries give rise to financing constraints and then the rate of net worth to total capital for firms can affect investment. Mathematically, Kasuga (2004) represents his arguments with the following equations:

$$I = F(\Delta NW), \text{ where } \Delta NW = bS \quad (2)$$

with  $I$  representing domestic investment,  $S$  is domestic saving,  $\Delta NW$  is an increase in (aggregate) net worth, and  $b^M \in [0, 1]$  represents the propensity to spend on newly-issued stocks (out of domestic saving). Kasuga (2004) contends that this hypothesis can explain both high saving-investment correlations for countries with developed equity markets (OECD countries, for example) and lower correlations in countries with less developed equity markets (developing countries, for example).

In Kasuga's (2004) opinion, Equation 1 suggests that savings affect net worth and hence investment; the effect of saving on investment depends on  $b$ , which is determined by financial structure and the level of financial development. Furthermore, if domestic saving is more likely to be spent on newly issued stocks, the effect of saving becomes larger (if saving is spent on bonds or deposited in banks, then it does not affect  $\Delta NW$ ). Finally, Kasuga (2004) notes that

since  $b$  is unobservable, an index measuring financial development has to be employed in the empirical analysis.

### Data and Empirical Results

Annual time series data is utilised for all countries, covering the period 1977-1999. All of the data were obtained from the World Bank's World Development Indicators (CD-ROM, 2001). The results in Table 1 show marked differences in the savings-investment correlations in the countries studied, with positive, statistically significant, and higher coefficients in the countries with more developed equity markets.

Table 1: Estimated Coefficients without Equity Market

Country	OLS		IV	
	Coefficient	Standard Error	Coefficient	Standard Error
Grenada	0.277	0.200	0.116	0.145
St. Vincent and the Grenadines	-0.116*	0.060	-0.101	0.073
Guyana	0.496**	0.205	0.507**	0.208
Jamaica	0.776***	0.233	0.662***	0.222
Trinidad and Tobago	0.407**	0.163	0.486**	0.205

Note: \*, \*\*, and \*\*\* indicate statistical significance at the 10%, 5%, and 1% levels, respectively

These results are consistent with both OLS and IV. Interestingly, we find no evidence of a positive effect of saving for those countries with little or no equity markets. In fact, the saving-investment correlation is negative in St. Vincent and the Grenadines. But, are these differences due to the level of development of the respective equity markets? Put differently, do these observed differences in the estimated coefficients reflect the influence of  $b$  in Equation 2? To address this issue, we have included in the original model (Equation 1) two proxies to represent



the level of development of the equity market—portfolio bond investment, which consists of bond issues purchased by foreign investors and denominated in current U.S. dollars; and Stocks traded, which refers to the total value of shares traded as a percentage of GDP. Data for this latter variable were available only for Jamaica and Trinidad and Tobago over the period 1988-1999. The results from this exercise are contained in Table 2.

Table 2: Estimated Coefficients with Equity Market

Country	OLS		IV	
	Coefficient	Standard Error	Coefficient	Standard Error
Grenada	0.289	0.213	0.135	0.154
St. Vincent and the Grenadines	-0.111*	0.060	-0.094	0.073
Guyana	0.475**	0.219	0.480**	0.223
Jamaica (1)	0.740***	0.207	0.655***	0.193
Jamaica (2)	-0.178	0.324	-0.205	0.326
Trinidad and Tobago (1)	0.391***	0.167	0.483***	0.204
Trinidad and Tobago (2)	0.208	0.275	0.271	0.225

Notes: (a) \*, \*\*, and \*\*\* indicate statistical significance at the 10%, 5%, and 1% Levels, respectively

(b) 1 and 2 represents estimates using portfolio bond issue and stock index, respectively. The stock index estimates cover the period 1988-1999

Not surprisingly, the results from Table 1 do not capture the 'true' relationship between savings and investment since we have not controlled for other influences on I/Y. Notice, as we added the proxy for the level of development of the respective equity markets the coefficients for S/Y have not changed in sign for any of the countries, using both the OLS and IV methods. Furthermore, the coefficients for the countries with relatively more developed equity markets are still higher than those for countries with less developed equity markets. This suggests that

saving continues to have a positive effect on investment, having accounted for differences in the level of development of the respective countries' equity markets.

Furthermore, the estimated coefficients for the proxy used to capture the level of development of the equity market are all positive and statistically significant for Guyana, Jamaica, and Trinidad and Tobago. These results provide some empirical support for the hypothesis that  $b$  captures the impact of increases in net worth on investment. The estimated coefficients for Grenada, and St. Vincent and the Grenadines were negative, statistically insignificant, and relatively small.<sup>1</sup> These findings are consistent with the initial hypothesis since only equity issues have positive effects on investment.

### **Summary and Conclusion**

In this paper, we examined saving-investment correlations in five Caribbean countries; namely, Grenada, Guyana, Jamaica, St. Vincent and the Grenadines, and Trinidad and Tobago, using annual time series data for the period 1977-1999. Although these countries were chosen on an ad hoc basis, they do represent somewhat the three levels of development of the primary equity markets in the region. The empirical model employed has its foundations in the work of Feldstein and Horioka (1980).

Our results, though tentative, suggest that countries with relatively developed primary equity markets have larger saving investment correlations. The results indicate that, if domestic saving increases net worth, then, it in turn, will increase domestic investment. The impact of domestic saving on domestic investment depends, in part, on the level of development of the primary equity market in a country. These findings are consistent with those of Kasuga (2004).

---

<sup>1</sup>These coefficients were not reported in the table. They are available upon requests from the authors.

Finally, given the thrust of our initial effort, it is obvious that our paper suffers some of the same limitations documented in Section 2. Within this context, we propose to extend this study to address these shortcomings. In this regard, we intend to develop a methodological approach similar to that employed by Moosa (2004).

## References

- Dooley, M.; Frankel, J.; and Mathieson, D.J. "International capital mobility: what do saving-investment correlations tell us?" IMF Staff Papers. 34 (1987): 503-530.
- Feldstein, M. and Horioka, C. "Domestic saving and international capital flows." Economic Journal. 90 (1980): 314-329.
- Kasuga, Hidefumi. "Saving-investment correlations in developing countries." Economics Letters. 83 (2004): 371-376.
- Moosa, Imad A. "The Feldstein-Horioka Puzzle Revisited: Evidence from Some Arab Countries." <http://www.irti.org/alexConf/papers/S1P1.pdf> (21/10/04). (June 2004): 22 pages.
- Schneider, Benu. "Saving-Investment Correlations and Capital Mobility in Developing Countries with Special Reference to India." Indian Council for Research on International Economic Relations. Working Paper NO. 48. (July 1999): 63 pages.
- Vamvakidis, A. and Wacziarg, R. "Developing Countries and the Feldstien-Horioka Puzzle." IMF Working Paper. IMF, Washington, DC. (1998).
- Wong, D.Y. "What do savings-investment relationships tell us about capital mobility?" Journal of International Money and Finance. 9 (1990): 60-74.
- World Bank. CD-ROM World Development Indicators. Washington, D.C.: World Bank. 2001.