



Pooled Mean Group estimation on international capital mobility in African countries

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ABSTRACT

This paper investigates the relationship between the savings and investment rates for 37 African countries over the period 1970–2006, using the recently developed Pooled Mean Group cointegration technique. Our results show that in the long-run, capital was relatively mobile in African countries, while, in the short-run, coefficients are not significant. However, there are marked differences in ratio retentions between country groups. The savings retention coefficient is higher in civil law countries than in common law countries. Furthermore, our results show that the Feldstein–Horioka coefficient is relatively lower in non-CFA than in CFA countries. These results have some policy implications.

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1. Introduction

In their controversial paper, [Feldstein and Horioka \(1980, hereinafter FH\)](#), propose assessing capital mobility by measuring the correlation between savings and investment. They argue that savings and investment would be perfectly correlated in a closed economy but should be unrelated in an open economy because savings could seek out the highest global return. Using cross-section regressions across 16 OECD countries for the period from 1960 to 1974, FH find that the estimate of the correlation between savings and investment ranges from 0.87 to 0.91. They conclude that almost 90% of domestic savings remains within a country to finance domestic investment. Therefore, capital is not internationally mobile, in contradiction to the belief that the industrial countries had few barriers to capital movements. Subsequent empirical studies confirmed that the coefficient of savings retention is close to unity for a variety of OECD cross-sections, but similar studies conducted in developing countries suggested a lower correlation between savings and investment.¹ As the conventional wisdom embodied in most macroeconomic models is that capital mobility is high in an industrial open economy, the FH view posed an uncomfortable puzzle.

This circumstance raises problems for the FH interpretation² of the coefficient of savings as a measure of capital mobility. [Coakley et al. \(1996\)](#) provide a different interpretation, viewing the FH coefficient as a direct indication of a country's long-run current account solvency constraint. This constraint requires the balance of payments as a share of GDP to be stationary as the cumulated balance of payments or national debt cannot be allowed to explode. However, the balance of payments is the difference between savings and investment, which implies that savings and investment are cointegrated with a unit coefficient. It is this long-run, cointegrating relationship that the FH coefficient measures.

The pioneering work of FH has generated increasing empirical studies. The new focus in the FH literature is on solving for the structural break in the relationship of savings and investment. For example, [Rao et al. \(2010\)](#) used the system GMM panel data method of [Blundell and Bond \(1998\)](#) and the structural break test of [Mancini-Griffoli and Pauwels \(2006\)](#) to reassess

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¹ See [Wong \(1990\)](#), [Montiel \(1994\)](#), [Mamingi \(1997\)](#), [Coakley et al. \(1999\)](#), [Kim et al. \(2005\)](#) and [Adedeji and Thornton \(2008\)](#).

² The FH interpretation has been widely challenged in the literature.

the savings–investment relationships for 13 OECD countries from 1960 to 2007. They found that the FH puzzle exists in a weaker form with a much reduced savings retention coefficient. The Bretton Woods agreement, in particular, seems to have weakened the FH puzzle by significantly improving international capital mobility. Similar results have been found by Kumar and Rao (2011) on a sample of 13 OECD countries from 1960 to 2007.³ In the same vein, Byrne et al. (2009) used PANIC methodology that allows them to separate idiosyncratic correlation at the country level from correlation at the global level. In a major break with the existing literature, they reject the existence of a long-run relationship in the idiosyncratic components of savings and investment. They suggest that the low savings–investment estimate may be due to external shocks.

While there have been increasing empirical studies on OECD countries, there are a limited number of empirical attempts to verify the presence of capital mobility using the FH approach for African countries.

Studies by Payne and Kumazawa (2005) and De Wet and Van Eyden (2005) used three-panel estimated data, pooled ordinary least squares (OLS), fixed effects (FE), and random effects (RE) to examine the savings–investment relationships in sub-Saharan African countries over the period 1980–2000. The empirical evidence suggests the presence of capital mobility in Africa. Adedeji and Thornton (2007) performed an interesting study using panel cointegration.⁴ They applied data for six African countries, using panel cointegration techniques to test the FH approach. Their main result is that capital was relatively mobile in the African countries during 1970–2000, with estimated savings retention ratios of 0.73 (FMOLS), 0.45 (DOLS), 0.51 (DOLS with heterogeneity) and 0.39 (DOLS with cross-sectional dependence effects). Unfortunately, the study by Adedeji and Thornton (2007) is limited to six countries and does not examine various country groups in Africa with panel cointegration tests using a Pooled Mean Group (PMG) estimator. This paper attempts to fill this gap.

This paper attempts to estimate the FH coefficient using recently developed panel cointegration techniques in a large panel of African countries. This paper is distinct from other studies in two major respects.

First, it applies a new heterogeneous panel unit root test and uses the Pooled Mean Group (PMG) estimator proposed by Pesaran et al. (1999). The Pooled Mean Group is an intermediate estimator that allows the short-term parameters to differ between groups while imposing equality of the long-term coefficients between groups.⁵ According to Jansen (1998), the short-run coefficient represents the average contemporaneous co-movement of savings and investment in response to shocks, which have struck the economy in the past. Whether this correlation is positive, zero or negative depends on the size and nature of the shocks and the structure of the economy.⁶ Therefore, taking into account this specification may provide a better assessment of the long-run coefficient that reflects international capital mobility or solvency constraint.

Second, this study measures the international capital mobility of the African economies across the sample that considers relative homogeneous groups of countries in Africa (CFA franc zone and non-CFA franc zone countries and civil law and common law countries). Previous studies paid less attention to this aspect. Indeed, splitting the sample into different groups of countries in Africa is motivated for several reasons⁷:

(i) Africa is characterized by heterogeneous countries with different economic structures. Hence, there are a large number of potential monetary and exchange rate arrangements. Current arrangements are notable for their diversity, ranging from the common currency union (CFA franc zone and Rand zone) to freely floating exchange rates. In the optimum currency discussion, capital mobility is also a factor that can influence the desirability of fixing the exchange rate (Ingram, 1969). The main question is whether the existence of a monetary union in Africa (especially in the franc zone) leads to better capital mobility. Furthermore, the literature has abundantly highlighted that correlation between savings and investment is unitary under a fixed exchange rate regime. In contrast, in the flexible exchange rate regime, the association between savings and investment is less than unity (Özmen, 2007).

(ii) Recent economic studies suggest a strong link between finance and law (La Porta et al., 1998, 2008). The idea is that a variety of legal rules (e.g., those governing both investor protection and legal procedures) can influence the protection of outside investors and, hence, financial markets. In this regard, Shleifer and Wolfenzon (2002) show that in countries with better investor protection, a larger fraction of the invested capital comes from the external market, and a small fraction comes from internal funds (the funds of the entrepreneurs setting up). Hence, it is interesting to analyse the FH puzzle, taking into account the legal origins.

The outline of this paper is as follows. Section 2 briefly reviews a few relevant empirical studies on the savings and investment relationship in developing countries. Section 3 introduces the empirical methodology. The data and empirical results are presented and interpreted in Section 4. Section 5 concludes and presents some policy implications.

³ In this paper, no attempt is made to test for a structural break. We test rather the individual heterogeneity that is more relevant in African countries.

⁴ Murthy (2005) used the same approach and found a moderate degree of capital mobility among African countries.

⁵ Pesaran et al. (1999) argue that there are often good reasons to expect the same long-run equilibrium relationships across countries because of budget or solvency constraints, arbitrage conditions or common technologies influencing all groups in a similar way. The reasons for assuming that short-run dynamics and error variance should be the same tend to be less compelling.

⁶ Notice that the short-run correlation between savings and investment is an unrestricted coefficient.

⁷ The split of the sample is motivated by the need to have a homogeneous sample. Indeed, these countries usually have less formal judicial procedures. Hence, it is interesting to divide the sample into common law and civil law countries. Furthermore, capital mobility is important because it has implications for single currency debates. Indeed, the African central bank governors and the African Union have decided to adopt a single currency by 2021 in all African countries. In this regard, the main question is whether the existence of monetary union in Africa (especially for the franc zone) leads to better capital mobility.

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