



The Feldstein–Horioka puzzle in groupings of OECD members: A panel approach



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ABSTRACT

This paper investigates the relationship between investment and savings in 26 OECD countries and demonstrates that the relationship changes when the countries under consideration in the selected panel vary. Accordingly, panel estimations using annual data for the period from 1970 to 2008 have been made for various groupings of developed countries, specifically the OECD as a whole, the EU15, NAFTA and the G7. Additionally, the paper examines changes in investment savings relationships when the presence of structural shifts in developed countries – where such exist – are taken into account. Recently developed panel techniques are employed to examine the investment savings relationship and estimate saving-retention coefficients. The empirical findings reveal that the Feldstein–Horioka puzzle exists only in the panel of G7 countries, wherein the saving-retention coefficient is estimated as 0.754 and 0.864 (for the full sample of G7 countries and for stable G7 countries, respectively). The estimated saving-retention coefficient for unstable G7 countries is 0.482, which indicates a higher level of capital mobility in unstable countries with respect to stable ones. This conclusion is further supported by the estimations for OECD countries and the EU15.

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1. Introduction

For the last three decades, many studies have been conducted in attempt to explain and solve the Feldstein–Horioka puzzle (FHP), which came out of the seminal work of Feldstein and Horioka in 1980. In their study they found that investment and savings ratios are highly correlated in developed countries, which is evidence of low capital mobility. These findings are contrary to the expectation of a low correlation between investment and savings, particularly given the sample of developed OECD countries. Since then, the literature has paid a good deal of attention to the FHP (consider, for example, literature surveys by Frankel (1992), Coakley et al. (1998), and Apergis and Tsoumas (2009)).

Studies on the FHP differ in terms of both methodology and econometric technique, where cross-sectional data (see Feldstein and Horioka, 1980; Murphy, 1984; Penati and Dooley, 1984; Dooley et al., 1987; Coakley et al., 1998; Herwartz and Xu, 2010), time-series data (see Miller, 1988; Argimon and Roldan, 1994; Jansen, 1996; Coakley and Kulasi, 1997; Caporale et al., 2005), as well as panel data (see Corbin, 2001; Ho, 2002; Fouquau et al., 2008; Kollias et al., 2008; Georgopoulos and Hejazi, 2009; Vasudeva Murthy, 2009; Rao et al., in press; Herwartz and Xu, 2010) have been employed.

The conclusions of empirical studies using panel data vary according to the econometric technique applied. In a study of 23 OECD countries, for example, Fouquau et al. (2008) employed a smooth transition regression model, wherein the

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saving-retention coefficient broken down by five factors that have the most significant effects on a country's capital mobility, deemed to be economic growth, demography, degree of openness, country size and current account balance. The results of the study indicate a strong heterogeneity in the capital mobility of developed countries. Moreover, it was found that the estimated coefficients for the OECD sample generally fall between the years 1960 and 2000.

Kollias et al. (2008), on the other hand, employed a bounds testing procedure to detect cointegration in a cross-sectional sample of 15 European Union members for the period from 1962 to 2002. At the same time, the authors applied panel data techniques to test for individual and temporal effects. The results suggest that the country specific parameter is random while the time specific parameter is fixed. The savings retention coefficient fell between 0.148 and 0.157, indicating high capital mobility for the sample.

Banerjee and Zanghieri (2003) examined 14 European Union members over the period 1970–2002. They employed the Johansen country-by-country cointegration test and the Pedroni panel cointegration test. The results generally support the integration hypothesis in the data series. At the same time, the authors importantly emphasize that the results are dependent on the grouping of countries and the possibility of cross-unit cointegration.

Most empirical studies with panel data have concentrated on large samples of OECD countries in line with the work of Feldstein and Horioka (1980) (for example, Ho, 2002; Fouquau et al., 2008; Adedeji and Thornton, 2008). Another group of studies has narrowed its focus to European Union countries (Banerjee and Zanghieri, 2003; Telatar et al., 2007; Kollias et al., 2008) or to even smaller samples of OECD countries (Georgopoulos and Hejazi, 2009; Rao et al., in press; Narayan and Narayan, 2010). Another type of study compares groups of developed vis-à-vis developing countries (Sinha and Sinha, 2004; Adedeji and Thornton, 2008; Herwartz and Xu, 2010). Indeed, Sinha and Sinha (2004) found evidence for capital mobility in only 16 of the 123 countries considered in their study, and most of those 16 were developing countries. Taking into account that macroeconomic series such as investment and savings are sensitive to domestic and worldwide economic and political changes, it is important to analyze saving-retention coefficients in the presence of structural breaks, if such exist. However, there are relatively few studies of OECD members with respect to the FHP that take into account the existence of structural shifts. Ozmen and Parmaksız (2003), Telatar et al. (2007), Mastroiannis (2007) and Kejriwal (2008) do consider the possibility of structural breaks in individual countries and in cross-sectional samples, but very few studies consider structural changes in the panel data of developed countries (for examples see Iorio and Fachin, 2007; Telatar et al., 2007; Rao et al., in press).

The results of analyses of the FHP vary depending on the econometric technique, the inclusion of structural changes, the selected samples of countries, and the time periods under consideration. Because there is a marked absence of homogeneity in the studies, it is difficult to draw a general conclusion from the literature.

This study makes a comparative analysis of the OECD sample with selected subsets of OECD countries. In particular, four groups are considered: OECD as a whole, the EU15, NAFTA and the G7. European Union member countries have more homogenous investment savings relations (see Blanchard and Giavazzi, 2002), while at the same time, members of narrow groups such as NAFTA or the G7 are more likely to have homogeneous investment policies when compared to a wider group such as the OECD. The purpose of this study is to examine investment savings associations and to find out how they change among different groups of developed countries in the presence of structural breaks – where such exist – or in the absence of structural changes when such breaks are not evident. The study further compares the results of panel cointegration tests with and without the inclusion of structural breaks, where relevant. The variation in the results is investigated when developed countries are divided into more homogenous groups and when existing structural breaks are included in analysis.

The data sample includes 26 OECD member countries, but excludes Chile, the Czech Republic, Hungary, Poland and the Slovak Republic because they lack homogenous data for the full period of time under consideration. The annual data for the period – from 1970 to 2008 – are taken from the official statistical site of the OECD. The remainder of this paper is organized as follows: the next section presents the applied methodological approach, the third section reports the empirical results and, the last section details the conclusions.

2. Methodology

This study investigates the degree of capital mobility of OECD members compared to different subsets of developed countries all the while taking into account identified structural breaks. In order to estimate the level of capital mobility in OECD countries, Feldstein and Horioka (1980) used the following equation:

$$\left(\frac{I}{Y}\right)_i = \alpha + \beta \left(\frac{S}{Y}\right)_i + e_i \quad (1)$$

where I is gross domestic investment, S is gross domestic savings and Y is the gross domestic product of the country under consideration, i . Coefficient β – known as the saving-retention coefficient – measures the degree of capital mobility. If a country possesses perfect capital mobility, the value of β should approach 0. As the value of β approaches 1, it suggests the immobility of the country's capital. The results of Feldstein and Horioka's analysis showed that the value of β for 21 open OECD economies varied from 0.871 to 0.909, demonstrating a relative immobility of international capital in the countries considered. Such controversial results set off widespread debate in the economic literature, and while numerous studies have corroborated the results, at the same time, contradictory results exist in the literature along, with an array of possible

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