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The Feldstein–Horioka puzzle and capital mobility: The role of the recent financial crisis

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ARTICLE INFO

Article history:

Received 27 July 2015

Received in revised form 29 February 2016

Accepted 24 May 2016

Available online xxx

JEL classification:

C23

F21

F32

F38

Keywords:

Feldstein–Horioka puzzle

Capital mobility

Financial crisis

ABSTRACT

The Feldstein–Horioka (FH) puzzle has long been debated as it relates to the important topics of capital mobility and how to determine levels of investment. Adopting a recursive approach and panel techniques, this paper explores the impacts of the recent financial crisis on the validity of the puzzle. The OECD's saving–investment correlation dropped to a record low just before the 2008 crisis began, reflecting the perceived 'end' of the FH puzzle in some studies. But since the onset of the crisis, our results indicate that this correlation has increased, suggesting the puzzle's return. The puzzle for net capital-importing and net capital-exporting countries differs, with the relationship being more significant for the exporters compared to the importers, reflecting the asymmetry in terms of the degree of shocks across countries.

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1. Introduction

Capital mobility is central to open-economy macroeconomics following the removal of capital controls in many countries during the 1970s and 1980s. Feldstein and Horioka (1980) (FH) investigated this phenomenon and found an unexpectedly high correlation between domestic saving and investment rates. These results led Feldstein and Horioka (1980) to conclude that there was low capital mobility among OECD economies. The paper soon became a puzzle as it contradicts the traditional wisdom of relatively high capital mobility among developed countries.

The voluminous literature that has sprung up as a result reflects, in part, the important implications that the puzzle has on government policy. First, if capital mobility is low, much of the increase in saving would be reinvested domestically (Feldstein, 1983; Schmidt-Hebbel et al., 1996; Coakley et al., 1998). So governments might provide more incentives to encourage saving. Second, in the absence of measurement errors, the difference between domestic saving and investment mirrors the current account balance. A high saving–retention coefficient may therefore reflect governments' targeting of a current account balance (Obstfeld, 1986; Roubini, 1988; Summers, 1988; Coakley et al., 1996; Taylor, 2002). Third, since the onset of the recent financial crisis, there has been a repatriation of international capital back to domestic countries. This repatriation of finance may have affected the way in which saving and investment move across countries and, as a relatively new theme, this has not as yet become apparent in the literature.

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This paper aims to contribute to the literature by investigating the role of the 2008 financial crisis in the puzzle's development. Specifically, the paper asks the following questions: Is the FH puzzle still a puzzle? Did the recent financial crisis affect the puzzle's validity in the OECD and are the effects asymmetric across OECD countries? The last two questions have not as far as we know been attempted in the literature yet. This paper argues that the answer to all of the above is yes, and that the puzzle has returned post crisis. This has important policy implications. The rest of this paper is structured as follows. Section 2 reviews the literature. Section 3 sets out the methodology. Section 4 discusses the results and Section 5 concludes with a policy discussion.

2. Literature review

In a world of perfect capital mobility, saving should be invested to ensure the highest return, regardless of geographical location. Hence, there should be a low correlation between domestic saving and investment rates. [Feldstein and Horioka \(1980\)](#) challenged this post-war consensus by estimating the equation:

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

where I , S and Y respectively denote investment, saving, and GDP of country i .

In this cross-sectional model, β is the saving-retention coefficient. It measures how much domestic saving is retained for domestic investment. [Feldstein and Horioka \(1980\)](#) tested the model for OECD countries over the period 1960–74 and found that β was greater than 0.85 on average. This contradicts the post-World War II notion that capital mobility had improved among developed countries. Referred to in many subsequent studies as the FH puzzle, [Obstfeld and Rogoff \(2000, p.175\)](#) coined the seminal work “the mother of all puzzles”.

2.1. Empirical evidence for OECD countries

[Murphy \(1984\)](#) re-investigated the saving-retention coefficient using a sample of 17 OECD countries over 1960–80. Sample countries were divided into big and small groups according to their investment shares. Using a cross-sectional approach, small countries were found to display lower coefficients (0.57–0.59). The group as a whole nevertheless exhibited a strong saving–investment correlation. For [Murphy \(1984\)](#), the FH model is a joint test for both capital mobility and that countries are small relative to the group. His results questioned the robustness of [Feldstein and Horioka's \(1980\)](#) findings across all countries. [Feldstein and Bacchetta \(1991\)](#) extended the sample period to 1960–86 and expanded the sample to 23 OECD countries. While robust, the saving-retention coefficients showed signs of declining. Many other FH-related studies largely confirmed the presence of the puzzle among OECD countries ([Feldstein, 1983](#); [Obstfeld, 1995](#); [Armstrong et al., 1996](#); [Coakley et al., 1996](#); [Abbott and De Vita, 2003](#); [Schmidt, 2003](#); [Georgopoulos and Hejazi, 2005](#); [Narayan, 2005](#); [Fouquau et al., 2008](#)).

[Georgopoulos and Hejazi \(2005\)](#) formalised the assessment of the decline of β by adding a time interaction term to the pooled version of [Feldstein and Horioka's \(1980\)](#) model:

$$\left(\frac{I}{Y}\right)_{it} = \alpha + \beta \left(\frac{S}{Y}\right)_{it} + \delta \left[\left(\frac{S}{Y}\right)_{it} * t\right] + u_{it} \quad (2)$$

where t is a time period of 1 to 31 years (1970–2000).

Saving retention is thus measured by $(\beta + \delta t)$ instead of β in [Feldstein and Horioka's \(1980\)](#) sense. δ was found to be negative and highly significant, meaning capital mobility was indeed increasing over time. [Blanchard and Giavazzi \(2002\)](#) observed that there were enduring current account imbalances in Europe and re-tested [Feldstein and Horioka's \(1980\)](#) model using a sample of OECD, EU and euro-area countries. For euro-area sample countries, the saving-retention coefficient dropped from 0.41 over 1975–90 to 0.14 over 1991–2001. This followed the policy of encouraging the free movement of capital within the euro area. Whilst confirming the FH puzzle among OECD countries, [Blanchard and Giavazzi \(2002\)](#) claimed the end of the puzzle from the euro area's perspective. However, the puzzle's disappearance in the euro area was shown to be ephemeral by [Johnson and Lamdin \(2013\)](#). They took a sample of 17 euro-area and 10 other European countries. An event-driven approach indicated the euro crisis began in 2006. They then tested whether capital mobility had decreased as a result. The coefficient was found to be positive and significant, translating to a 12% increase compared to the β obtained in the base case scenario.

2.2. Alternative approaches to [Feldstein and Horioka \(1980\)](#)

An emerging consensus in the literature is that ignoring structural breaks in the saving and investment series tends to bias the saving-retention coefficient upwards ([Kejriwal, 2008](#); [Guzel and Ozdemir, 2011](#); [Ketenci, 2012, 2013](#)). For instance, [Ketenci \(2013\)](#) grouped his sample of OECD countries into EU15, countries in NAFTA agreements, and the G7. He established both saving and investment series to be $I(1)$ variables, which satisfied the pre-requisite for conducting [Hansen's \(1992\)](#) stability test. Next, taking the p -values from the *MeanF*, [Ketenci \(2013\)](#) was able to distinguish between stable and unstable

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