International Review of Economics and Finance 33 (2014) 1–11

Contents lists available at ScienceDirect

International Review of Economics and Finance

journal homepage: www.elsevier.com/locate/iref

Re-examining the Feldstein–Horioka and Sachs' views of capital mobility: A heterogeneous panel setup

Mark J. Holmes [a,*], Jesús Otero [b]

[a] Department of Economics, Waikato University, New Zealand
[b] Facultad de Economía, Universidad del Rosario, Colombia

ARTICLE INFO

Article history:
Received 7 October 2013
Received in revised form 7 March 2014
Accepted 10 March 2014
Available online 17 March 2014

JEL classification:
F3
F4
F6

Keywords:
Feldstein–Horioka
Capital mobility
Current account
Heterogeneous panel

ABSTRACT

We re-examine two complementary views of international capital mobility using data for 25 OECD countries over the period 1970–2011. Estimation of the original Feldstein–Horioka and Sachs' equations provides mixed evidence of capital mobility, though we do not detect a significant bias towards finding in favour of capital immobility in using time-averaged data. However, potential bias in cross-sectional estimation motivates us to examine the data as a heterogeneous panel which allows us to control for the effects of cross-sectional dependence and endogeneity. In addressing the Feldstein–Horioka puzzle, application of the CCEMG estimator of Pesaran (2006) to the Feldstein–Horioka and Sachs' equations points towards greater (though not perfect) capital mobility than hitherto found.

1. Introduction

Recent events surrounding the global financial crisis and its aftermath have highlighted the profound macro- and microeconomic implications of high international capital mobility. Measuring capital mobility, however, has proved to be problematic. On the one hand, one might follow Frankel (1992) and others by using covered interest parity as an appropriate indicator of the degree of financial integration and therefore capital mobility across national boundaries. An alternative way forward is to consider a more indirect approach that concentrates on the effects of capital mobility on macroeconomic aggregates such as the relationship between domestic savings and investment (Feldstein & Horioka, 1980). Here it is argued that in a world with a perfect mobility of capital, domestic savings would search for the highest returns in the world capital markets independent of domestic investment demand and, in the same way, world capital markets would satisfy domestic investment needs independent of the supply of local savings (Taylor, 1996). Domestic savings would react to the international rates of return and so investment would be funded from the world capital market through a current account deficit. If, however, capital were perfectly immobile, then one would expect domestic savings and investment to be characterised by a correlation coefficient of unity.[1]

* Corresponding author at: Department of Economics, University of Waikato, Private Bag 3105, Hamilton 3240, New Zealand. Tel.: +64 7 838 4454.
E-mail addresses: holmesmj@waikato.ac.nz (M.J. Holmes), jesus.otero@urosario.edu.co (J. Otero).

[1] Commencing with the work of Obstfeld (1994), it has been argued that conditional on consumers exploiting all risk-sharing opportunities, financial integration produces benefits in terms of consumption risk sharing and smoothing, as domestic consumption growth becomes less correlated with domestic income growth, but more correlated with world consumption growth. See, for example, Suzuki (2014), who provides recent empirical estimates of the extent to which domestic consumption and income are delinked because of financial integration.

http://dx.doi.org/10.1016/j.iref.2014.03.002
1059-0560/

Obtaining a correlation of savings and investment close to one in their cross-section analyses for industrialised OECD countries for the 1960–1974 period, led Feldstein and Horioka (1980) to reject the capital mobility assumption. The presence of a high correlation between domestic savings and investment despite the easing of capital controls has constituted a puzzle that has been the focus of an extensive literature. Such studies have employed cross-section and/or time series data in an attempt to reconcile Feldstein and Horioka's (F–H) results with the capital mobility hypothesis; see, *inter alia*, survey articles by authors such as Lapp (1996), Coakley, Smith, and Smith (1998) and Apergis and Tsoumas (2009) and references therein. Following Rao, Tamazian, and Kumar (2010), Ketenci (2013) and others, it seems reasonable to draw on the findings of a limited number of key studies drawn from a large literature. The original F–H findings were initially confirmed by Feldstein (1983) and Feldstein and Bacchetta (1991), who extended the sample period to include the post-Bretton Woods agreement. Among the studies using cross-sectional or panel methods focussed on OECD countries, Tesar (1991) estimates the *savings retention coefficient* or proportion of incremental savings that is invested domestically to be of the order of 0.85, and Coakley, Fuertes, and Spagnolo (2001) confirm that capital mobility exists in the long-run at least with a savings retention coefficient of 0.32. Further work by Giannone and Lenza (2010) employing a Factor Augmented Panel Regression technique sees a slightly higher savings retention coefficient of the order of 0.35 over various sub-samples embodied by a 1970–2007 study period, while Kollias, Mylonidis, and Paleologou (2008) find much lower panel-based regression coefficients of around 0.15. Katsimi and Moutos (2009) apply OLS methods to broader definitions of savings and investment (that account for the accumulation of human capital) and obtain a savings retention coefficient which is about 0.5. Fouquau, Hurlin, and Rabaud (2009) use a Panel Smooth Threshold Regression Model and provide estimates of the savings retention coefficient of around 0.65 for the period 1960–2000. Di Iorio and Fachin (2007) utilise panel tests allowing for cointegration between savings and investment in the long run with a structural break. Their country specific estimates of the savings retention coefficient range from 0.59 to 1.03 based on a fully modified OLS for the study period 1960–2002. Lastly, a recent evidence by Ketenci (2013) employing panel dynamic OLS estimates a savings retention coefficient of 0.27 in the case of the OECD over the study period 1970–2008.

In this paper, we approach the F–H puzzle by taking the view that it can be adequately addressed through a heterogeneous panel estimation that accommodates the presence of cross-sectional dependence. By doing this, we are able to provide a more realistic assessment of the extent of capital mobility which turns out to be greater than hitherto thought. It seems reasonable to argue that countries will differ in the correlation between domestic savings and investment. Furthermore, it is plausible that savings and investment across counties will have a tendency to move together over time. The relationship between domestic savings and investment may be driven by common factors such as productivity shocks. The failure to take on board these latter considerations can give rise to size distortion and erroneous inference drawn from the estimated domestic savings–investment correlations. In order to address these important economic considerations, we examine the F–H hypothesis through the application of estimators from the heterogeneous panel literature, including the Pesaran (2006) cross correlated effects mean group (CCEMG) estimator. A key advantage associated with the CCEMG estimator is that in assessing the relationship between domestic savings and investment, endogeneity can be accommodated when it arises from the common factors driving both the dependent and independent variables. Coakley, Fuertes, and Spagnolo (2004) first apply this estimator to examine the F–H puzzle using a panel data set of 12 OECD countries over 1980Q1–2001Q4. Payne and Kumazawa (2006) then extend the analysis by Coakley et al. (2004) to a panel of 47 developing countries over the period 1980–2003. Their estimates of the slope coefficient in the investment–savings equations are lower than those based on traditional cross-sectional estimations, indicating higher capital mobility.

We contribute to the previous literature by using data on 25 OECD countries over the period 1970–2011, and applying the CCEMG estimator not only to the F–H equation, but also we provide a first application of this estimator to the Sachs (1981) equations, which consider the relationship between the current account and savings and investment ratios. This latter approach takes into account the role of savings and investment in current account dynamics. Indeed, if the complete absence of capital mobility means that domestic savings and investments move closely in tandem, then the current account should be unaffected by fluctuations in domestic savings or investments. We believe that the simultaneous examination of the empirical approaches of F–H and Sachs provide a more complete view of the international mobility of capital. The former is based on the consideration of two domestic variables for a given country, whereas the latter involves analysing the behaviour of the external deficit of that country with respect to the rest of the world. The choice of the sample period can be justified on the grounds that the previous four decades have seen on major institutional changes that have considerably eased the mobility of capital, especially among developed countries. This should be reflected in a lower correlation between domestic savings and investment. Using our sample of 25 OECD countries, this is indeed the case when we conduct a year-by-year estimation of the investment–savings relationship as opposed to estimation using time-averaged data. In contrast to the previous cross-sectional estimates, we do not detect a significant upward bias in the savings and investment correlation involving time-averaged data. In turn, the Sachs equations point to the insignificance of investment in driving the current account. This implies that investment and savings are correlated, which is in turn consistent with the absence of capital mobility. However, when examining the data within a heterogeneous panel framework with cross-sectional dependence, both savings and investment turn out to be factors that help explain the behaviour of the current account pointing to stronger capital mobility.

The structure of this paper is as follows. Section 2 describes the data used in the analysis. Section 3 presents the results of the empirical analysis and discusses their economic implications. Section 4 concludes.

2. Data

The data set, obtained from the OECD iLibrary (as downloaded on 23 January 2013), consists of 42 annual observations from 1970 to 2011 on investment, gross savings and the current account (where the latter is calculated as the difference between gross