

“A Note on Human Capital and the Feldstein-Horioka Puzzle”

Authors’ response to the comments of the referee

The referee raises three issues regarding our paper. The first two are more general and apply to the majority of the existing empirical literature on the Feldstein-Horioka (F-H) puzzle whereas the third one is specific to our paper.

First point: *High correlation between saving and investment is consistent with a high degree of capital mobility under complete capital markets.*

This is a valid theoretical argument initially brought forward by Baxter and Crucini (1993). As we mention in our paper the existing literature on the F-H puzzle can be divided into two groups: The first group tries to reconcile the high correlation between saving and investment found by F-H with the existence of full capital mobility [see Bayoumi (1990), Barro et al (1995), Baxter and Crucini (1993) and Coakley et al (1996)]. The second group tries to challenge the empirical finding of F-H itself (see Sinn (1992) and Caporale et al (2005)). Our paper belongs to the second group and therefore it does not attempt to add an alternative explanation to the literature of the first group.

Moreover, as Obstfeld and Rogoff (2000) have noted, the “explanations” offered for the F-H puzzle (including Baxter and Crucini (1993)) “tend to be clever but empirically inadequate and, more troublesome still, tend to fix one puzzle at the expense of creating others”. For example, if one wants to dispute the Feldstein and Horioka interpretation of the high ‘saving retention coefficient’, how can they at the same time explain the finding by Dekle (1996) that the ‘saving retention coefficient’ in a setting of known near perfect capital mobility (among Japanese regions) is insignificantly different from zero – a finding fully consistent with the Feldstein and Horioka explanation. In addition, the Feldstein and Horioka interpretation is perfectly consistent with the fall of the ‘saving retention coefficient’ among the European Union countries due to the process of monetary integration among them which culminated in the adoption of the Euro (Blanchard and Giavazzi (2002)).

Second point: *The F-H empirical finding as well as ours may reflect not controlling for “common factors”. If financial markets are integrated, then if we control for these common factors then saving and investment should not be correlated.*

The argument implies that we estimate a miss-specified model in which we do not take into account global factors such as global interest rates that drive investment and savings simultaneously in all countries. So the high correlation witnessed in the empirical literature may reflect the existence of such common factors. In order to account for such factors in the saving-investment regression, the referee suggests running investment and saving regressions on these common factors and to use the residuals of these regressions to measure the correlations between investment and saving. This may be a promising way to challenge the original empirical finding of F-H. The methodology suggested is clearly well founded from an econometric point of view and applies to a wide area of empirical economic research. However, in our view, the referee’s argument is valid only in the case where the common factor affects both investment and saving in the same direction. If the common factor is, as the referee suggests, the global interest rate, then it should affect savings positively and investment negatively as implied by both theory and empirical evidence. In that case the residuals are likely to be even negatively correlated and not taken into account this factor will produce low correlations quite opposite from what the referee suggests. Thus, the existence of ‘common factors’ cannot in our view explain the empirical finding of high correlation between saving and investment.

Third point: *It is not clear how human capital is measured. Is the same variable being added in both sides of the regression?*

We have to agree with the referee that regarding the data used in our paper our exposition is rather brief and probably not very clear. We looked for the best available data in order to construct a variable that approximates investment in human capital. To this purpose we included all expenditure for education that is not already included in the definition of investment. The most complete data set available is the widely used OECD Education at a Glance data set. It provides education expenditure by country, source and type of transaction for all levels of education. Thus, we construct our investment in human capital variable, I_h , as *total expenditure for education* (all sources and types of expenditure for all levels of education) minus *government direct expenditure for educational institutions designated for capital*. The reason for subtracting the latter

type of expenditures is that they are already included in total investment as part of public investment.

Our definition of investment that includes investment in human capital implies that private expenditure on education, I_{hpr} is part of investment since it is included in I_h . However, private expenditure on education is also included in the definition of consumption, C . Let us denote total consumption as private expenditure on education and the remaining components of total consumption, C_r : $C = C_r + I_{hpr}$. If I_{hpr} is excluded from C and included in investment, then the measurement of savings, S , should also be adjusted since $S = Y - C = Y - C_r - I_{hpr}$. Removing private expenditure on education from consumption implies that I_{hpr} should be added in S . This implies that, compared to the variables used by F-H, we add **total expenditure for education in the definition of investment** whereas, in order to avoid measuring I_{hpr} twice, we add **private expenditure for education in the definition of savings**.