

## Measuring Capital Mobility: A Review of the Feldstein-Horioka Approach

### Author's Details:

<sup>(1)</sup>Yao HONGXING-Jiansu University, Zhenjiang 212013-PR China <sup>(2)</sup>KOUNDE Geraude Fortune M. Jiansu University, Zhenjiang 212013-PR China <sup>(3)</sup>Philip Agyei PEPRAH-School of Finance and Economics, Jiansu University Zhenjiang 212013 PR China

### Abstract

*In this paper, we present the approach of Feldstein-Horioka on the mobility of capital and analyze the developments that it has evoked over the years. Though it was developed long ago, the F-H theory has remained very open to different critical approaches that have evolved since Karl Popper's non-naive methodological thinking: the criticism, in parallel with the attempts of consolidation ("immunization") of K Popper. Over the years, these consolidation efforts led this approach to incorporate new econometric methodologies and to partially change its purpose, taking into consideration some external sustainability and other recent factors.*

**Keywords:** *Feldstein-Horioka, Capital Mobility, Savings, Investment, External Constraints*

### Introduction

Economists often use the term puzzle to refer to awkward empirical facts that refuse to comply with their established theoretical frameworks. The equity premium puzzle of Mehra and Prescott (1985) is a well-known example. Feldstein-Horioka's approach continues to be considered as one of the most important puzzles in economics. This thesis has generated many writings, in which corrections and extensions have been suggested, as well as reactions that criticize or reject the interest of this thesis. We believe that these studies are perfect examples of scientific practice as Karl Popper has partially described. In response to the difficulties of non-refutation, consolidation attempts (of "immunization" in the sense of Karl Popper) were constructed. And from the whole discussion about whether to refute or exclude the refutation, new problems and new analysis proposals were created. The F-H thesis was initially presented as a simple measure of the international mobility of capital. In this survey, we review the responses to the puzzle posed by Feldstein and Horioka (1980). FH argued that, under perfect capital mobility, there is no necessary association between national saving and investment since saving can globally seek out the highest returns. The implication is that an exogenous increase in investment in any country can be financed by a perfectly elastic supply of global funds. By contrast, zero capital mobility implies a one-to-one relationship between saving and investment, since saving has to be invested domestically. In this case, we have a world of segmented capital markets in which each country's interest rate is determined domestically, and domestic monetary and fiscal policies are relatively effective.

In our first section, we will present some empirical theories to reinforce the assumption on the importance of financial integration for the growth of an economy. But also we will show that this integration can cause a problem of external sustainability as a result of imbalances between investments and savings. In section two, we will present the original relationship of Feldstein-Horioka to measure the international mobility of capital and the theoretical assumptions of this relationship. In section three, we will then explore the many attempts by authors to "immunize" the somewhat surprising results that we obtain in many cases with the F-H approach. In section four we will discuss the possible lack of significance in the F-H approach. Since this thesis is finally presented only in the form of a linear relationship between investment and saving, we will expose in section five the problems of indigenisation that Occurs. Section six focuses on relations between national savings and external savings can create a context that prevents the empirical confirmation of the F-H thesis. The non-mobility implied by this thesis may be only the consequence of the external sustainability of the economy as proved by the co-integration analysis between investment and savings, this will be discussed in section seven, and finally, we will present our conclusions.

### 1- Capital mobility and growth

An economy is said to be integrated internationally if capital flows can enter and leave the country freely and if domestic financial assets are good substitutes for the financial assets of other countries. This brings out two important concepts: the degree of openness and the degree of integration of the country, the international mobility of capital being only the first step towards integration (Artus 1992). The actual and financial integration in the underdeveloped economy has the consequence of aggravating the negative external balances. And a country whose growth is faster than that of the others will, in principle, have an imbalance in its larger balance (Obstfeld and Rogoff 2005).

The development of the banking and financial sector, as a first consequence of the increased competition, will produce a considerable diversification of financial instruments, which may increase savings. But, at the same time, the liquidity restrictions of individuals will be reduced, and optimistic expectations of future income will lead to the reduction of current savings. Let us not forget that integration into the world economy from the point of view of real trade will lead to increasing the elasticity of substitution of domestic goods by foreign goods and increasing consumption per unit of income. The reduction in the real interest rate will be greater than the nominal rate reduction as a result of the Balassa-Samuelson effect. This, in turn, helps to increase consumption and reduce current savings.

The evolution of the real exchange rate may be another explanation for the negative values of the balance of the trade balance. This assumption is more likely in the case where monetary policy has favored the rise of the real exchange rate to combat inflation. As financial integration develops, the country risk will decrease, and the financial system will be able to access lower costs for external savings, which will reduce competition for the capture of national savings. The development of risk protection practices will also contribute to the reduction of national savings (Russell, Evans, et al. 2002).

One of the factors that can counteract this negative evolution of the current account of the countries in growth is the increase of the activity rate which will have to increase the level of the local savings. We must, therefore, expect a reduction in the balance of the current account which may lead to the external non-sustainability of the economy. Irrespective of this latter result, economists believe in the creation of considerable profits regarding the rate of internal investment and the rate of growth of the economy (Agénor, Izquierdo, et al. 2003) as a result of the mobility of capital. So, the question for developed and underdeveloped economies is how to measure the international mobility of capital (Edison, Levine, et al. 2002).

#### Supporting Evidence of Capital Account Liberalization on Growth

Wang (1990), develops a model in which international capital movements from the developed North to the developing South transfer's technology and shows that liberalization of the capital account leads to greater foreign direct investment leading to greater competition in which domestic firms try to be efficient. In the process, domestic savings are more efficiently used. The rate of technological change is an increasing function of the amount of foreign capital operating in the South and of the extent to which technology in the advanced country exceeds it in the less developed country. It is shown that when the South shifts from autarky to free capital mobility, its steady state growth rate of per capita income also increases.

Obstfeld and Rogoff (2005), presents a simple model of global portfolio diversification that links growth and financial openness. The setup is a stylized development of the idea developed by Grossman and Helpman (1991). The model asserts that ongoing growth depends upon investments that supply specialized and hence inherently risky production inputs. Because risky technologies in the model have higher expected returns than safe ones, international asset trade, which allows each country to hold a globally diversified portfolio of risky investments, encourages all countries to shift from low return safe investments towards high return risky investments. Provided risky returns are imperfectly correlated across countries and provided some risk free assets are initially held, a small rise in diversification opportunities always raises expected growth as well as national welfare. The key here is that financial liberalization can enhance growth even in the absence of net capital inflow.

Quinn (1997), is one of the most comprehensive studies to identify a positive result between capital account liberalization and growth. He uses a multivariate regression framework to determine the political and economic variables with which a change in international financial regulation is robustly associated. Quinn's study covers

58 countries over the period 1960 to 1989, and although his results suggest a significant effect of the change in capital account liberalization on growth, it is difficult to distinguish the impact of current account and capital account liberalisation separately

Edwards (2001), examines whether the relationship between capital mobility and growth is different for emerging and advanced economies and tests the impact of capital mobility on economic growth, where growth is estimated in terms of GDP growth and total factor productivity (TFP) growth. Klein (2003), offers robust empirical evidence that capital account openness contributes in an important way to economic growth for middle-income countries. He concludes that there is a need to carefully manage and sequence liberalisation, with appropriate controls, regulatory apparatus, and macroeconomic framework.

#### Studies not supporting the Hypothesis that Liberalisation Promotes Growth

In a widely cited study, Rodrik (1998) has cast doubts on the effects of capital account liberalisation on growth. In a sample that includes almost 100 countries, developing as well as developed, he finds no significant effect of capital account liberalisation, on the percentage change in real per capita income over the period 1975 to 1989 in growth regressions that also include initial per capita incomes, initial secondary-school enrolment rate, an index of the quality of government institutions and regional dummy variables. He also finds no relationship between capital account liberalisation and investment-to-income, nor between capital account liberalisation and inflation.

These results are broadly consistent with those of Kraay (1998) who undertakes a more comprehensive examination of the effect of capital account liberalisation on investment, growth, and inflation. The study includes data from 117 countries over the period 1985-1997 and uses three different measures of financial market development and policy environment. His regressions take the form of cross sections, with one observation per country, where the dependent variable is the growth in output between 1985 and 1997. He uses both OLS and the instrumental variable approach, in which the capital account liberalisation variables are instrumented by their own past values.

## 2- F-H regressions and capital mobility

Feldstein and Horioka (1980), propose assessing the degree of capital mobility by measuring the correlation between savings and investment. They estimate the following cross-sectional regression:

$$ITY_{it} = \alpha_i + \beta_i STY_{it} + \varepsilon_{it}$$

Where,  $ITY$  = ratio of investment to income,  $STY$  = ratio of savings to income,  $\beta$  = saving retention coefficient,  $i$  and  $t$  are country and time subscripts and  $\varepsilon_{it} \sim N(0, \sigma)$  for all  $i$  and  $t$

For a small, open economy where capital is perfectly mobile internationally,  $\beta$  should be close to zero. If  $\beta$  equals zero, then there is no relationship between savings and investment. Feldstein (1991), suppose that if  $\beta$  is large; however, capital is considered immobile internationally. For example, if  $\beta$  equals one, then all additional savings go to finance domestic investment. Using the average cross-sectional data across 16 OECD countries for the period from 1960 to 1974, Feldstein (1991) find the estimated coefficient of  $\beta$  ranging from 0.87 to 0.91. They conclude that some 90% of domestic savings remains within a country to finance domestic investment. Therefore, capital is not internationally mobile, in contradiction with the belief that industrialized countries have few barriers to capital movement. The high correlation between savings and investment is known as the Feldstein–Horioka puzzle. (Feldstein and Horioka 1980) finding that national savings and domestic investment are strongly positively correlated has generated many studies in this area. We will perform selective surveys on the savings and investment relationship using panel data.

The literature on this subject has ever since evolved, testing the FH hypothesis using three main approaches. The first is the price conditioning; measuring debt, and equity flows (interest parities and the co-movement of stock market returns). It measures the adjustment process of prices, interest rates and exchange rates across countries. The rationale is the fact that with integrations these variables adjust quickly to equilibrate any form of arbitraging opportunities that may exist in a country. This category includes; the real interest parity approach,

uncovered interest parity, covered interest parity and the co-movement of stock market returns. The literature on this aspect can be found in the work of De Brouwer (1997), Frankel (1992), Lothian and Wu (2011), Fu, Li et al. (2016). Non-debt price measure which tries to predict the co-movement of the stock market return can be found in the works of Azman-Saini, Azali et al. (2002), el Alaoui, Dewandaru et al. (2015) and Thenmozhi and Srinivasan (2016)

The second approach consists of examining the current account identity, regressing the change in current account balance rate on the change in investment rate (studies such as Feldstein and Horioka (1980), Coakley, Kulasi et al. (1998), Gil-Alana, André et al. (2016) and Behera (2015).

The third approach by analyzing the endogenous policy response such as the impact of macroeconomic policies, institutions, other structural factors, Özmen and Parmaksız (2003), Bangake and Eggoh (2012). Most of the studies validate the FH findings suggesting low capital mobility and some of the explanations to this unresolved puzzle ascribes to factors such as differences in the policy environment, information & technology, demography, etc.

We will present here four definitions of international capital mobility to understand the content of the precursor equation: (i) the definition of F-H tells us that changes in domestic savings will not affect investment ; (ii) the real interest rate parity tells us that mobility will bring about the equalization of real rates between countries; (iii) the unhedged interest rate parity establishes that the capital flows will result in equalization of the expected rates of return of the bonds of each country, taking into account the foreign exchange risk exposure for each from them; (iv) the interest rate parity tells us that mobility will create a single interest rate measured against a common currency.

With these propositions, we can organize the hierarchy of the requirements of each of them. Definition (iii) requires (iv) with a zero price for currency risk. In turn (ii) demands (iii) with zero expectations on the actual devaluation of the currency. Finally, definition (i) requires the verification of (ii) and that any other variable, other than the real interest rate, which can determine the investment, has no influence on national saving. As a result, it is clear that the definition of F-H is the most demanding. Taking into account the existence of the exchange rate risk and its cost (the cost of this risk) and also the expectations of the real loss of the value of the currency, we will certainly observe considerable differences, between countries, in the real interest rates. And in this case, we must expect that the retention coefficient of F-H (beta) may have values far from unity.

From a more formal point of view, we can say that the condition of perfect mobility of F-H, ( $\beta=0$ ) requires four conditions (Eijffinger, Huizinga, et al. 1998), which are the following:

(i)  $I_{i,t+k} = -\varphi \cdot E_t(r_{i,t+k}) + \mu_i$  ; investment is linearly dependent on expectations on the country's real interest rate;

(ii)  $Cov\left(\frac{S_{i,t+k}}{Y_{i,t+k}}\right) = 0$  ; the stochastic term  $\mu_i$  which summarizes all the factors that influence the investment beyond the real interest rate, should not be correlated with the ratio of savings;

(iii)  $Cov\left[E_t(\dot{r}_{i,t+k}), \frac{S_{i,t+k}}{Y_{i,t+k}}\right] = 0$ ; the savings ratio must have no relation with the expected external real interest rate, Obstfeld and Rogoff (2005) ; and finally :

(iv)  $Cov\left[E_t(r_{i,t+k} - \dot{r}_{i,t+k}), \frac{S_{i,t+k}}{Y_{i,t+k}}\right] = 0$ ; the difference in the parity of the real interest rate is not correlated with the savings ratio.

The conditions required by F-H for a perfect integration are really leonine. It is therefore natural that different ideas about the integration of economies can be arrived at when using other methods. International mobility studies using purchasing power parity, or interest rate parity conditions, conclude that capital is mobile (Cooray and Sinha 2007). Also, the so-called "consumption smoothing" approach is less demanding from the point of view of the assumptions and, if one uses the equalization of the real interest rates as integration measure, we conclude in favor of the financial integration because of the increase in the speed of this integration (Goldberg, Lothian, et al. 2003).

From a methodological point of view, F-H's thesis is extremely powerful; it corresponds, theoretically, to what is desirable because it exposes itself to its refutation. In principle, it does not protect itself or hide, from a possible refutation. The problem, which is also frequent in economics, is that its possible refutation led to the creation of auxiliary conditions to protect it, for the "inevitable immunization."

### **3- Immunization theories of the Feldstein and Horioka approach**

The "immunization" procedure for the F-H puzzle is no different from the common "immunization" procedures in economics. Most of the models that have worked on the F-H hypothesis have followed two paths: that of attempting to reconcile their results with the accepted fact of the mobility of capital and that of proposing new methods more appropriate to the problem in question (Blanchard and Giavazzi 2002).

With regard to the conciliation of the results, the use of the FH equation and the study of the retention coefficient led the authors to confirm two ideas: the international mobility of capital was very high during the period of the classical gold standard; it was much lower during the validity period of the Bretton Woods agreements, and there was a growing trend after the abandonment of that regime (Coakley, Kulasi, et al. 1998); at the same time, the mobility of capital for less developed countries is always higher than that for the most developed (Gil-Alana, André et al. 2016). However, such generally accepted results do not mean that there are no other studies that obtain other results that contradict them. For example, (Payne and Mohammadi 2006) show that, in the case of Europe, the value of  $\beta$  increased between 1979 and 1993 compared to 1960-78; Cyrille (2010) in a study applied to underdeveloped countries in Africa came to the conclusion of the absence of mobility, and (Coakley, Kulasi et al. 1998) argue that a lower retention rate for some underdeveloped countries may be the result of economic policies in response to weaker external imbalances in these countries than in more developed countries.

Concerning the new methods, we must quote the studies that criticize the use of the more traditional methods and express the opinion that the non-stationary approaches, applied to the temporal or panel data, are good tools for the study of the puzzle of F-H. Prior to this proposal, many authors obtained good results confirming the mobility hypothesis using fixed-effect panel data processing models. And just about the usual unit root tests for panel data, and then co-integration tests, there's also a literature that warns us about the possible presence of cross-unit cointegration. in our economic variables (Banerjee, Marcellino, et al. 2005) that can lead us to fallacious results.

### **4- Possible lack of significance in the F-H approach**

According to Pomfret (1997), the F-H test is a reasonable measure of capital immobility, not the mobility of capital. The null value of  $\beta$ , ( $\beta = 0$ ), is a sufficient condition but not a necessary condition for the perfect mobility of capital. And the value of  $\beta$  equal to 1 does not necessarily imply the immobility of capital (Singh 2016).

More radical is the position of Mishkin (1986): if there is no structural model that can explain investment in terms of savings, any econometric correction of such a relationship will lead to results that can only be incomprehensible.

Regarding the application of non-stationary techniques to temporal data, Jansen (1997) says that cointegration destroys the informative content of the F-H analysis. A radical position is that of Levy (2003) who writes "that there is nothing extraordinary in the results of F-H. The neo-classical model of growth provides that, in equilibrium, investment and savings will be proportional to the product. It would be strange. Moreover, that one does not meet a strong correlation between I and S". We call this opinion apparently radical because, to have econometrically robust results, we must have long periods, and in this case, we must necessarily expect a  $\beta$  equal to 1.

### **5- The indigenisation of savings and investment**

The very high correlation between investment and saving, which is at the center of "Puzzle," may only be the result of exogenous factors that affect these two variables. This may be the case of population growth (Obstfeld and Rogoff 2005), the existence of productivity shocks or of another type, the presence of non-tradable consumer goods, and this may be the most important factor. More importantly, government policy responses to external imbalances.

Transaction costs, imperfections in the goods and labor market and the presence of a home bias may also lead to a retention coefficient of unity. To solve some of these problems, annual averages can be used to eliminate the cycle, add other variables to the regression, or use instrumental variables. But this problem of endogeneity is not easy to solve, as (de 2007) has well illustrated: from the empirical point of view, if we do not include the omitted variables, we will have a problem of false correlation; if we include them, we will have destroyed the value of the F-H test from a theoretical point of view. Thus, in "cross-section" studies, as we have already said, if we retain sufficiently long periods, the value of beta will be tangentially equal to unity.

### 6- Complementarity or substitutability between national savings and external savings

In the relations between national savings and foreign savings, two possibilities must be considered: their complementarity and their substitutability.

Assuming that national savings and international savings are complementary. An economy will become more attractive for external capital if its level of internal savings is high. The latter will function as collateral from the point of view of foreign investors. This case is interesting not because the value of  $\beta$  will be close to unity, but because it must stabilize within a certain interval to be determined. Mobility will increase, and the value of  $\beta$  will continue to remain more or less constant. The other possibility, more in line with the principles of the theory, is the general case of substitutability (Sachsida and Caetano 2000). Let's admit the behavioral equation of F-H:

$$\frac{I}{Y} = \alpha + \beta \cdot \frac{S_d}{Y} \quad \text{with the identity of investment and savings:}$$

$$\frac{I}{Y} = \frac{S_d}{Y} + \frac{S_x}{Y} \quad \text{Where « d » and « x » refer to the national or foreign nature of savings. By substitution, we obtain: } \frac{S_x}{Y} = \alpha + \gamma \cdot \frac{S_d}{Y}, \text{ with } \gamma = \beta - 1$$

If the two types of savings are not correlated,  $\gamma = 0 \Rightarrow \beta = 1$ . The reading of the absence of capital mobility is no more than the result of a zero correlation between the two types of savings.

### 7- On the lack of mobility and external sustainability

Coakley, Kulasi, et al. (1998) support the thesis that F-H does not measure mobility, but external sustainability. A coefficient close to unity is no more than the result of the intertemporal budget constraint. A very simple development, based on the accounting identity of the macro-economic equality between global supply and demand, makes it possible to explain this argumentation.

From the definition:  $Y = C + I + G + (X - M)$

$$\text{And } \frac{S-I}{Y} = \frac{(X-M)}{Y}.$$

The stationarity of  $\frac{X-M}{Y}$  is enough to prove external solvency. This stationarity means that series  $\frac{I}{Y}$  and  $\frac{S}{Y}$  are integrated of order 1 and co-integrated with the co-integration vector (1, -1). In this case, we can accept a long-term relationship between investment and saving, but we cannot deduce any result with respect to the international mobility of capital from the value of the coefficient  $\beta$  long period ( $\beta=1$ ).

The econometrics of the non-stationary variables solved the problem of estimation, but it led to new questions. Corbin (2004) proposes that, if co-integration is not rejected, the adjustment coefficients in the ECM model represent the intensity of the mobility of the capital. But in this case, we can also ask the question of government interventions, in a short period, to push the economy towards its long-term equilibrium. So will the analysis be in relation to mobility or the effectiveness of interventions? This question can never be answered in a simple way (Kumar, Sen, et al. 2014). In addition, the problem of size must also be raised, and let us not

forget that, with the increase in the number of observations, the probability of stationarity of the BC balance increases. Ruptures in series also raise particular problems (Özmen and Parmaksız 2003).

This econometric methodology still raises two types of questions. The first, of a more practical nature, is that we cannot compare the studies of the F-H equation made with this new methodology with, say, the studies done with the old methodology (Behera 2015). The other question concerns the inadequacy of a large number of estimates that are made to illustrate the relationship of F-H. The estimates made in first differences (Feldstein 1991) are not correct if the variables are co-integrated. Just as, moreover, we must not study the relation by an ECM equation where the external solvency is imposed, because we constrain the interdependence of the variables used.

Taylor (1996) and (Banerjee, Marcellino, et al. 2005) propose the equation  $\Delta I_t = \alpha + \beta \cdot \Delta S_t + \gamma \cdot (S_t - I_t)$  to test the presence of co-integration.

Why isolate this equation from a system that wanted to be multivariate? Why impose the constraint of zero coefficients for delays in the growth rate of the investment? For these authors,  $\gamma$  measure the degree of mobility. Jansen (2000) proposes  $\beta$  to measure short-term mobility and  $\gamma$  long-term mobility. For Banerjee and Zanghieri (2003), the first coefficient is more or less constant and the second is reduced considerably when we study fourteen EU countries from 1960 to 2002. Beyond an over-simplification, the interpretation of coefficients is not clear.

## Conclusion

In this paper we have reviewed the way economists have responded to the FH puzzle, using Stigler's generic comments to introduce their lines of attack. In the process, we have examined a large number of competing interpretations of the FH coefficient. It will be apparent that the general tone of contributions is largely but by no means unanimously negative toward the FH interpretation of low capital mobility. This famous "puzzle" of F-H continues today to get the interest of many economists. This theory began as a simple measure of the international mobility of capital whose theoretical foundations are extremely demanding. Its resistance to refutation has led economists to situations of "confirmation" of cases already known to them, but also to new discoveries on methods appropriate to the measurement of the international mobility of capital. As a result, (Feyerabend 1993) "methodological anarchism" dominated the story of this "puzzle." The empirical confrontation led to consolidate ("immunize" in the sense of Popper) the thesis with the adoption of auxiliary conditions. We have also seen the possibility of meaninglessness so that it can achieve its goal: to measure the mobility of capital. The complexity of the problem of endogeneity can lead to the destruction of the thesis. The relationships of complementarity and substitutability have important consequences for the importance of measuring mobility. The intertemporal sustainability of the external accounts leads to a new reading of the coefficients of the F-H relation, from both long term and the short term perspective

## References

- i. Agénor, P.-R., et al. (2003). *The integrated macroeconomic model for poverty analysis: a quantitative macroeconomic framework for the analysis of poverty reduction strategies*, The World Bank.
- ii. Artus, P. (1992). "Passage à l'union économique et monétaire en Europe: effets sur la croissance et les politiques budgétaires." *Économie & prévision* **106**(5): 123-137.
- iii. Azman-Saini, W., et al. (2002). "Financial integration and the ASEAN-5 equity markets." *Applied Economics* **34**(18): 2283-2288.
- iv. Banerjee, A., et al. (2005). "Testing for PPP: Should we use panel methods?" *Empirical Economics* **30**(1): 77-91.
- v. Bangake, C. and J. C. Eggoh (2012). "Pooled mean group estimation on international capital mobility in African countries." *Research in Economics* **66**(1): 7-17.

- vi. Behera, S. R. (2015). "International Capital Mobility and Saving-Investment Relationship in the Newly Industrialized Countries." *International Review of Applied Economics* 29(3): 287-308.
- vii. Blanchard, O. and F. Giavazzi (2002). "Current account deficits in the euro area: the end of the Feldstein-Horioka puzzle?" *Brookings papers on economic activity* 2002(2): 147-209.
- viii. Coakley, J., et al. (1998). "The Feldstein–Horioka puzzle and capital mobility: a review." *International Journal of Finance & Economics* 3(2): 169-188.
- ix. Cooray, A. and D. Sinha (2007). "The Feldstein–Horioka model re-visited for African countries." *Applied Economics* 39(12): 1501-1510.
- x. Cyrille, S. M. (2010). "Saving-investment correlation and capital mobility in Sub-Saharan African countries: A reappraisal through inward and outward capital flows' correlation." *International Journal of Economics and Finance* 2(2): 97-106.
- xi. De Brouwer, G. (1997). *Interest parity conditions as indicators of financial integration in East Asia*, Australia-Japan Research Centre.
- xii. de, S. (2007). "Teza Feldstein-Horioka-jedna mera međunarodnog kretanja kapitala." *Panoeconomicus* 54(1): 53-67.
- xiii. Edison, H. J., et al. (2002). "International financial integration and economic growth." *Journal of International Money and Finance* 21(6): 749-776.
- xiv. Edwards, S. (2001). *Capital mobility and economic performance: are emerging economies different?*, National bureau of economic research.
- xv. Eijffinger, S. C., et al. (1998). "Short-term and long-term government debt and nonresident interest withholding taxes." *Journal of Public Economics* 68(3): 309-334.
- xvi. el Alaoui, A. O., et al. (2015). "Linkages and co-movement between international stock market returns: Case of Dow Jones Islamic Dubai Financial Market index." *Journal of International Financial Markets, Institutions and Money* 36: 53-70.
- xvii. Feldstein, M. (1991). *Domestic saving and international capital movements in the long run and the short run*. International Volatility and Economic Growth: The First Ten Years of The International Seminar on Macroeconomics, Elsevier Science Publishers BV.
- xviii. Feldstein, M. and C. Horioka (1980). "National saving and international capital flows." *Economic Journal* 90: 314-329.
- xix. Feyerabend, P. (1993). *Against method*, Verso.
- xx. Frankel, J. A. (1992). "Measuring international capital mobility: a review." *The American Economic Review* 82(2): 197-202.
- xxi. Fu, Y., et al. (2016). "Real interest rate parity in Asian countries: evidence from the quantile unit root test." *Applied Economics Letters* 23(12): 844-848.
- xxii. Gil-Alana, L. A., et al. (2016). "The Feldstein–Horioka puzzle in South Africa: A fractional cointegration approach." *The Journal of International Trade & Economic Development* 25(7): 978-991.
- xxiii. Goldberg, L. G., et al. (2003). "Has international financial integration increased?" *Open economies review* 14(3): 299-317.
- xxiv. Grossman, G. M. and E. Helpman (1991). *Innovation and growth in the global economy*, MIT press.

- xxv. Klein, M. W. (2003). *Capital account openness and the varieties of growth experience*, National Bureau of Economic Research.
- xxvi. Kraay, A. (1998). *In search of the macroeconomic effects of capital account liberalization*, unpublished.
- xxvii. Kumar, S., et al. (2014). "Does economic integration stimulate capital mobility? An analysis of four regional economic communities in Africa." *Journal of International Financial Markets, Institutions and Money* 29: 33-50.
- xxviii. Lothian, J. R. and L. Wu (2011). "Uncovered interest-rate parity over the past two centuries." *Journal of International Money and Finance* 30(3): 448-473.
- xxix. Mehra, R. and E. C. Prescott (1985). "The equity premium: A puzzle." *Journal of monetary Economics* 15(2): 145-161.
- xxx. Obstfeld, M. and K. S. Rogoff (2005). "Global current account imbalances and exchange rate adjustments." *Brookings papers on economic activity* 2005(1): 67-146.
- xxxi. Özmen, E. and K. Parmaksız (2003). "Policy regime change and the Feldstein–Horioka puzzle: the UK evidence." *Journal of Policy Modeling* 25(2): 137-149.
- xxxii. Payne, J. E. and H. Mohammadi (2006). "Capital mobility and savings-investment correlations: panel data evidence from transition economies." *Applied Economics Letters* 13(10): 611-613.
- xxxiii. Pomfret, R. (1997). *International Capital Mobility and the Feldstein-Horioka Paradox: Evidence from Settler Economies in the Gold Standard Era*. University of Adelaide Seminar Paper.
- xxxiv. Quinn, D. (1997). "The correlates of change in international financial regulation." *American Political science review* 91(3): 531-551.
- xxxv. Rodrik, D. (1998). "Who needs capital-account convertibility?" *Essays in international finance*: 55-65.
- xxxvi. Russell, B., et al. (2002). "The impact of inflation and uncertainty on the optimum markup set by firms."
- xxxvii. Sachsida, A. and M. A.-R. Caetano (2000). "The Feldstein–Horioka puzzle revisited." *Economics Letters* 68(1): 85-88.
- xxxviii. Singh, T. (2016). "Rhetorics of saving–investment correlations and the international mobility of capital: A survey." *The Journal of International Trade & Economic Development* 25(5): 636-690.
- xxxix. Thenmozhi, M. and N. Srinivasan (2016). "Co-movement of oil price, exchange rate and stock index of major oil importing countries: A wavelet coherence approach." *The Journal of Developing Areas* 50(5): 85-102.
- xl. Wang, J.-Y. (1990). "Growth, technology transfer, and the long-run theory of international capital movements." *Journal of international Economics* 29(3-4): 255-271.