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M. A. Taslim

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Department of Economics
University of New England
Armidale
New South Wales 2351
Australia

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M. A. Taslim

Department of Economics

University of New England

Armidale NSW 2351

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Saving-Investment Correlation and International Capital Mobility

I.

The extent to which capital is internationally mobile has important implications for domestic monetary and fiscal policies. As such the matter has received much attention in recent years. It was widely believed that the breakdown of the conferral Woods system of international payments, the floating of major currencies of the industrial world and the reduction or elimination of barriers to international flow of capital had created a world that closely approximated the theoretical ideal of perfect capital mobility as envisioned by authors like Mundell (1962) and Fleming (1962). This belief was, however, shaken by the findings of Feldstein and Horioka (1980, henceforth FH). They claimed that despite the apparent show of high mobility, capital was still largely immobile across international borders. Their empirical demonstration of this claim was based on the following arguments. If capital was really greatly mobile, then an increase in saving of a country should be distributed among a large number of countries such that there would be little correlation between saving and investment of any country.[1] Hence, a regression of an investment variable on a saving variable should give an estimate of the coefficient of the saving variable close to zero. But their regression analysis (of OECD data for the period 1960-74) consistently yielded a coefficient which they thought was insignificantly different from unity implying that domestic investment was still largely financed by domestic saving. Since this should not have been the case if capital were perfectly mobile across borders they cliamed that capital was largely immobile across international borders. In the subsequent analysis Feldstein (1983) and Feldstein and Bacchetta (1991) extended the empirical analysis to 1979 and 1986 respectively, but the qualitative results did not change much.

These findings and the claim of FH, which were at odds with the actual massive flows of capital between nations, led to a flurry of research activities. Much of it confirmed the empirical findings of FH. But, unlike them, the later researchers did not regard such findings to be a contradiction of the hypothesis of perfect mobility of capital. On the contrary, their efforts consisted of attempts to explain why there might be strong co-movement of saving and investment regardless of the

[1] It was recognised that this need not be the case if a country was large in comparison to other countries.

mobility of capital. It is interesting that there was little direct demonstration of the actual extent of capital mobility; many authors appeared to have taken perfect mobility to be an axiomatic truth and proceeded to analyse why the saving coefficient should be high despite this fact. One obvious answer to the conundrum was that both saving and investment were influenced, in the same direction, by other factors that were not included in the regression equations. These include: (a) systematic government policy intervention that perpetrate strong co-movement of saving and investment (Westpahl 1983, Summers 1988, Bayoumi 1990 and Koksela and Viren 1991), (b) population and economic growth both of which influence the two variables in a similar way (Obstfeld 1986) and (c) country size was also thought to be conducive to the alleged spurious relation (Murphy 1984, Obstfeld 1986).[2]

Although these authors advanced reasons why saving and investment ratios tended to be roughly equal despite considerable mobility of capital, none had challenged the notion that such an equality implied a lack of *ex post* movement of capital across international boundaries. In contrast, this paper takes the view that a near unitary coefficient of the saving ratio in the regression equation of FH and others is quite consistent with large cross border flows of capital. It discusses several examples of unitary coefficient of the saving variable despite free flows of capital. When the coefficient can assume a value close to one both if capital is highly mobile and if it is largely immobile, the usefulness of the coefficient as a suitable indicator of capital mobility is circumscribed.

II.

First consider a hypothetical extreme case of a world where capital is perfectly immobile between countries. In such a world, the saving coefficient in FH equation must be equal to one (except for reporting errors). Now consider another extreme situation where each country invests its entire saving in other countries. However, the structure of rates of return is such that each country receives about the same amount in investment from overseas investors. Saving and investment are,

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2 For an excellent discussion see Tesar (!991).

therefore, equal in each country, and consequently, the coefficient of saving ratio is again equal to unity, and yet, there is perfect mobility of capital by FH definition.

One might be tempted to argue that the above happens only because saving and investment have been defined in gross terms. There is actually no net movement of saving and investment, and consequently, there are no net capital flows. Although this quibble is quite beside the point as all the studies referred to above used mostly a gross definition of saving and investment, the argument applies, albeit in a restricted way, even when net concepts are used within a framework actually adopted by the aforementioned studies. For example, consider a situation where each country invests all its saving overseas in some years. In these years it does not receive any foreign investment such that total investment, gross or net, is zero.[3] In other years during the study period, an influx of net foreign investment offsets the lack of investment in the previous years. Now if we take the average saving investment ratio of the entire period, as done in all studies mentioned earlier, then the ratio would be approximately equal to one and by FH definition we shall be forced into conceding that capital is perfectly immobile, while it is the mobility of capital both ways that has given rise to this situation.

The situation is not just a theoretical curiosum as may seem to be the case at first blush, it is actually most likely to be the case in real life. Few countries can afford to run large deficits or surpluses for a prolonged period of time without some corrective measures of government or market origin coming into play to reverse the trend. Thus while each country may run either deficits or surpluses in the short term, over a longer span of time saving and investment are likely to be roughly equal. Using average ratios over a fairly long period (FH used 15 year averages) may obliterate whatever movement of capital actually occurs, such that the estimated saving coefficient turns out to be unity. The use of data averaged over a long period of time may help in avoiding the problems of cyclical variations, but it creates a worse problem as discussed above.[4]

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[3] For simplicity let us assume away the problems related to depreciation.

[4] Several countries like Austria, Finland and the USA have near identical saving and investment ratios when averaged over the fifteen year period, but there are considerable divergences between the two ratios from year to year. Recently

One could further argue in this vein that the use of yearly data may also mask or reduce the actual movement of capital across borders. A country may attract a great deal of international capital at the beginning of the year when the domestic interest rate is high relative to the world rate, but experience an outflow of capital of similar magnitude at the end of the year when the interest rate falls below the world rate. The balance of payments table would record only a small (or zero) current (capital) account deficit and the national accounts table would indicate a near equality between saving and investment. We would again be forced by FH criterion to concede that capital is internationally immobile despite the fact that a large amount of capital has moved into and out of the country during the year.[5]

Interdependence of countries of the world means that business cycles of individual countries tend to be synchronised. When the USA is riding a business boom, other countries share in the good fortune and move upward along their business cycles. When the USA experiences a downturn, other countries also follow suit. A Simple application of the life cycle hypothesis of Modigliani and associates would predict that the saving ratio would be high during booms and low during downturns. Thus, when the saving ratio of a country rises, other countries are also experiencing a similar rise. In her recent study Tesar (1991) finds that the correlation between saving rates among six of the largest OECD countries varied from a low of 0.597 to a high of 0.948.[6] The correlation between investment rates among the same countries ranged from 0.439 to 0.872. There seems little doubt that saving and investment rates tend to be strongly correlated. Therefore, it seems possible that when a country invests much of its incremental saving overseas, it also receives much foreign investment at the same time. If these amounts are roughly equal, national accounts data would show incremental saving and investment to be equal. Consequently, the coefficient of saving ratio

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Sinn (1992) has used a similar argument to comprehensively demonstrate why the saving coefficient estimated for averaged data cannot be used as a suitable index of capital mobility.

[5] According to the official balance of payments records, there was virtually no private capital movement in and out of Australia during the fiscal year 1992-93. The net capital account surplus was only A$ 33 million. But monthly statistics reveal that more than A$ 19 billion flowed into and out of Australia during the same year. Even this is an understatement of the gross flows as monthly figures are reported on a net basis. (See Reserve Bank of Australia *Bulletin,* December 1993.

[6] These countries are France, Germany, Italy, Japan , United Kingdom and United States.

would be close to unity. And yet it is the mobility of capital both ways that leads to the unitary coefficient.

Much of the controversy in the literature is due mainly to the extreme definition of perfect capital mobility employed by FH. In their world capital is perfectly mobile if (nearly) all saving of a country finances overseas investment and all domestic investment is financed by foreign saving. While no analyst would take issue with their contention that most of domestic investment is financed by domestic saving, few would agree with their concept of perfect capital mobility. The latter is usually regarded as describing a situation where cross border movement of capital equalises its (market determined) net rate of return in all countries. This is a much broader definition of capital mobility, and is consistent with both zero and massive movement of capital among countries. If for some reasons net returns to capital are equal between countries, there would be little incentive for capital to move to another country. But it would be illogical to interpret this *ex post* lack of movement of capital as an indication of a lack of *ex ante* mobility of capital. The latter refers to the *freedom* of capital to move across national boundaries with minimum transaction costs.

In this regard, the concept of perfect mobility of capital is analogous to perfect flow of water between two or more receptacles joined together (say, by a pipe). There will be an immediate flow of water between the receptacles if the water levels are not the same. But if the levels are the same to start with, there will be no actual flow of water between the receptacles. One cannot observe any actual flow of water unless there is a level differential. Conversely, one could also say that it is the perfect flow of water between receptacles that equalises their levels. Only when a barrier is erected to obstruct the free flow, a level differential could emerge. Similarly, only when there are impediments, whether observed or not, to free flow of capital, net return to capital could differ between countries. The equality of net return is, therefore, a much better index of capital mobility,[7] and it was so regarded by the pioneers of such analysis.[8]

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[7] It is possible that the net return could be equal between countries by sheer coincidence. While possible, it is extremely unlikely that such an equality would be maintained for any length of time.

[8] A leading current exponent of this view is Frankel (1991).

Next consider a world with one very large country (the USA) and several small countries (such as Norway, Luxemburg and New Zealand). Suppose the large country has a relatively low saving (S/Y) and investment (I/Y) ratios, and runs a small deficit ($I > S$). The small countries have relatively large saving ratios and run surpluses ($S > I$). However, the surpluses of the small countries have to be fairly large relative to their incomes in order to balance the large country deficit (a one per cent deficit of the USA is much larger than the entire GNP of a country like New Zealand). A hypothetical scatter diagram of saving and investment ratios are shown in Figure 1.a. An OLS regression line fitted to the points are also shown. Evidently it has a slope less than one. Now, let the situation be reversed without any change in the underlying capital market conditions: the large country is now assumed to have relatively large saving and investment ratios and runs a

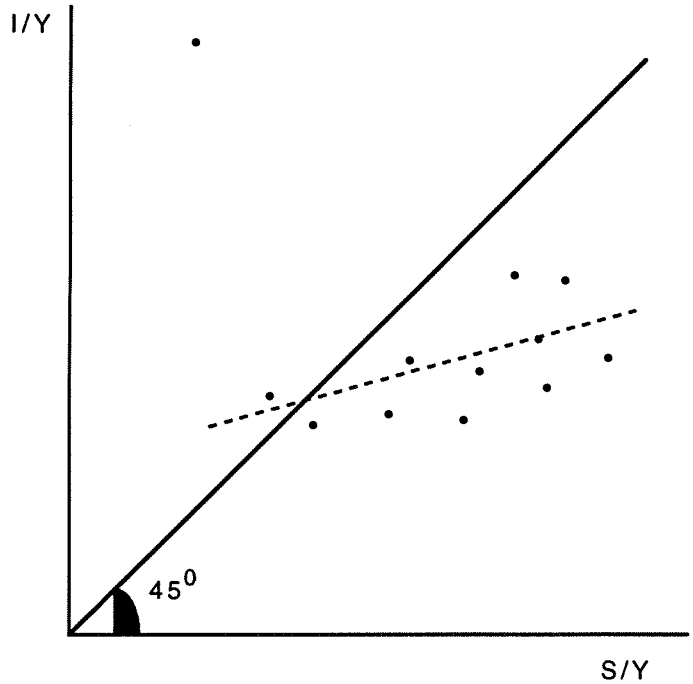

Figure 1.a.

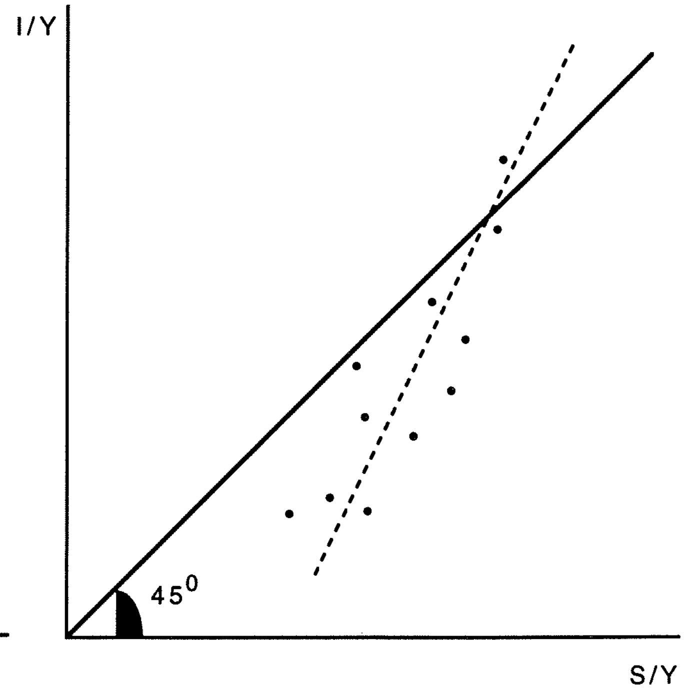

Figure 1.b.

small surplus while the rest have deficits. Such a situation is shown in Figure 1.b. The regression line now has a slope greater than one. There has been no change in the degree of capital mobility between these countries and yet we get a very different estimate of the slope coefficient.

One can actually go much further and claim that in principle, it is possible for the saving coefficient to assume any value between $-\infty$ and $+\infty$ in a world of perfect capital mobility. The OLS estimate of β is given by:

$$\hat{\beta} = \frac{\Sigma(s_i - \bar{s})(k_i - \bar{k})}{\Sigma(s_i - \bar{s})^2}$$

Where $\bar{s}$ and $\bar{k}$ are the mean saving and investment ratios respectively. Suppose a sample of countries is selected such that the saving ratio varies little across the sample, but there is wide variation in the investment ratio. In such a case the estimated coefficient would tend to be very large in absolute value. On the other hand, if the saving ratio varies a great deal across the sample but the investment ratio does not, the estimated coefficient $\hat{\beta}$ would tend to be very small in absolute value. Thus the value of β depends on the configuration of the saving and investment ratios even in a world where capital is perfectly mobile across international borders rendering it a rather poor index of the degree of international capital mobility.

In a world with substantial mobility of capital and countries of roughly equal size, the saving and investment ratios may be randomly distributed. However, the surpluses of one group (those below the 45° line) must exactly match the deficits of the others (those above the 45° line) if all countries are included in the sample.[9] A hypothetical scatter of these ratios from a cross-section study is shown in Figure 2. Many countries run very large surpluses or deficits. But a regression line fitted to these points could easily have a slope very close to one. If one were to accept the FH definition, then (s)he would also accept that capital is largely immobile. And yet this would be far from the truth. A regression line is a measure of average or central tendency. Since the surpluses must exactly match deficits when all countries of the world are included and disregarding errors and omissions (which in practice could be substantial), it is quite likely that the estimated line would tend to have a slope close to one.[10]

[9] If the sample contains only countries which have mostly deficits or surpluses, there could be large biases in the estimated coefficients.

[10] One reason that the slope may be different from unity is the very fact that a regression line is derived by minimising the sum of squares of deviations. A country running a five per cent deficit gets much more weight then five countries each running a one per cent surplus.

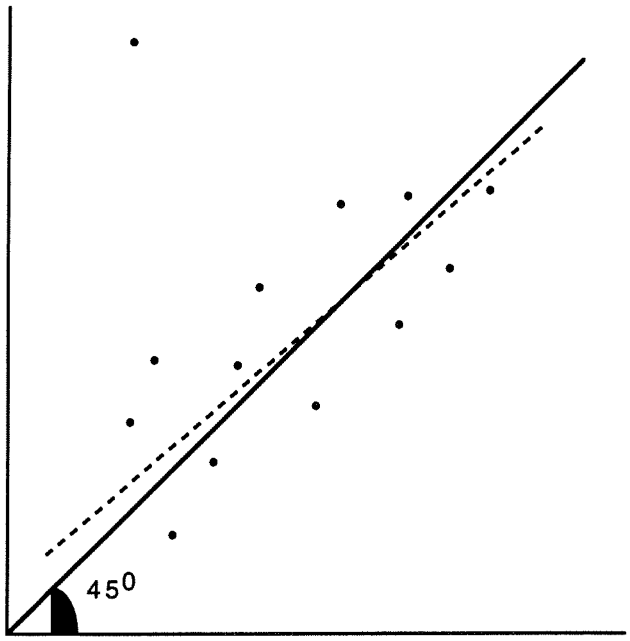

Figure 2#

The discussion and examples cited above strongly suggest that the saving coefficient in FH-type investment equation does not provide an unambiguous indication of the degree of capital mobility between countries. Much caution is needed to make any claim about the degree of mobility of capital based on the estimated value of the saving coefficient.

III.

The saving-investment correlation methodology suggested by FH is not based explicitly on a theoretical structure. However, a regression equation is meaningful only when it is backed up by an appropriate theory. But there is no theory, and FH have not provided any either, that states that investment is *explained* or *determined* by saving. Investment depends on a set of variables (**z**) like interest rate, current and expected profit etc. while saving is determined by another set of variables (**x**) like income and interest rate. A nation's saving provides means for gross accumulation, and hence, the association between saving and investment is a financing one. A simple ratio between the two shows the extent to which domestic investment is *potentially* financed by domestic saving. It may be remembered from earlier discussion that the ratio does not at all indicate the extent to which domestic saving actually finances domestic investment. What we then have is a simultaneous equations relationship:

$$I = I(z)$$

$$S = S(x)$$

and the financing relationship:

(1) $S - I \equiv CAB$, or in ratio form ,

(2) $I/Y \equiv S/Y - CAB/Y$[11]

The current account balance term *CAB* could also be function of some variables like the interest rate, exchange rate etc. One could perhaps test the financial relationship by setting up an equation of the form:

(3) $$\frac{I}{Y} = \alpha + \gamma\frac{S}{Y} + \beta\frac{CAB}{Y} + \varepsilon$$

Where ε is a white noise term. If there were no measurement errors, we should have: $E(\alpha) = 0$, $E(\beta) = -1$ and $E(\gamma) = 1$. Since, there are usually substantial measurement errors and omissions in overseas transactions and estimates of saving, the actual value of β and γ may diverge from unity.

FH and others used a truncated version of the above equation for their tests:

(4) $$\frac{I}{Y} = \alpha' + \gamma'\frac{S}{Y} + \mathrm{e}$$

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[11] There is a lack of clarity regarding the precise meaning of saving and investment ratios. Inspite of the fact that that these ratios can be defined in several alternative ways, many authors do not care to mention what ratios they are working with (see Wong 1990 for example). Although one could run a regression of any investment ratio on any saving ratio or vice versa as all such regression are equally without a theory, the financing equation (3) holds only when these ratios are defined in a certain manner. The investment ratio in (3) refers to the ratio of gross domestic investment and some measure of total output such as GDP or GNP. The saving ratio is the ratio of gross *national* saving and the same measure of output. Feldstein (1983) incorreectly states the financing equation when he interprets saving as gross domestic saving (p. 134). When one uses gross domestic saving in the financing equation the current account term must be replaced by net exports as GDS≡GDI+NX. Otherwise the estimated coefficients would be biased and inconsistent.

Where e is an error term. This is clearly a misspecification of the financing equation. One could still get an unbiased estimate of α and γ from the FH equation provided *CAB/Y* were orthogonal to *S/Y*. This does not appear to be the case with OECD data. The correlation between S/Y and *CAB/Y* for the period 1960-74 is 0.361 while that between *I/Y* and *CAB/Y* is 0.080.[12] When *S/Y* is correlated to *CAB/Y*, $\hat{\gamma}$ underestimates γ.

(5) $$E(\hat{\gamma}') = \gamma + \beta\theta$$

where θ is the saving coefficient in the regression equation:

(6) $$\frac{CAB}{Y} = \mu + \theta\frac{S}{Y} + u_i$$

μ is a constant and u_i is a white noise term.

We have estimated the following equations using data of twenty OECD countries for the period 1960-74:[13]

(7) $$\frac{I}{Y} = \underset{(0.023)*}{0.095} + \underset{(0.091)*}{0.647}\frac{S}{Y} \qquad \overline{R}^2 = 0.724, \quad F = 50.95, \quad AIC = 0.00045$$

(8) $$\frac{I}{Y} = \underset{(0.023)*}{0.072} + \underset{(0.087)*}{0.719}\frac{S}{Y} - \underset{(0.178)*}{0.407}\frac{CAB}{Y} \qquad \overline{R}^2 = 0.777, \quad F = 34.00, \quad AIC = 0.00038$$

(9) $$\frac{CAB}{Y} = \underset{(0.028)*}{-0.057} + \underset{(0.108)}{0.177}\frac{S}{Y} \qquad \overline{R}^2 = 0.082, \quad F = 2.71, \quad AIC = 0.00063$$

[12] For the period 1975-91, the correlation between *S/Y* and *CAB/Y* is 0.384 and that between I/Y and CAB/Y is 0.027.
[13] The OECD countries are Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Japan, Netherlands, New Zealand, Norway, Spain, Sweden, Switzerland, United Kingdom and United States.

It will be seen that the saving coefficient in (7), which is the FH equation, underestimates the coefficient in (8) by $\hat{\beta}\hat{\theta}\,(-0.407 \times 0.177)$. Thus the saving coefficient in FH study, which they regarded as very high, should be still higher and closer to unity than what they have actually found. The correct specification of the equation improves the adjusted R^2 and reduces Akake Information Criteion indicating a better fit.

The close relationship between *S/Y* and *CAB/Y* raises the problem of multicollinearity in (8) and could bias the estimates. The deviations of saving and current account coefficients from unity could also be due to this problem. However, since *I/Y* has very little correlation with *CAB/Y* and there is no presumption that *S/Y* explains *I/Y*, a better method of estimation of the financing relationship would be to have *S/Y* on the left hand side and *I/Y* on the right side. The estimated equations are:

(10) $$\frac{S}{Y} = \underset{(0.042)}{-\,0.042} + \underset{(0.160)^*}{1.143}\,\frac{I}{Y} \qquad \overline{R}^2 = 0.724, \quad F = 50.95, \quad AIC = 0.00079$$

(11) $$\frac{S}{Y} = \underset{(0.036)}{-0.027} + \underset{(0.135)^*}{1.112}\frac{I}{Y} + \underset{(0.208)^*}{0.601}\frac{CAB}{Y}, \quad \overline{R}^2 = 0.804, \quad F = 40.07, \quad AIC = 0.00058$$

(12) $$\frac{CAB}{Y} = \underset{(0.040)}{-\,0.025} + \underset{(0.153)}{0.052}\frac{I}{Y} \qquad \overline{R}^2 = -0.049, \quad F = 0.117, \quad AIC = 0.00072$$

The correlation between *I/Y* and *CAB/Y* being weak, the estimate of the investment coefficient in (10) does not vary much from that in (11).

Both (8) and (11) provide more satisfactory estimates than the truncated equations (7) and (10) as indicated by the improvement in adjusted R^2 and *AIC*. This would appear to confirm that the latter are misspecifications of the former. As mentioned earlier, the correlation between *S/Y* and *CAB/Y* could make the estimates in (8) unreliable. But, there being little correlation between *I/Y* and *CAB/Y*, the estimates in (11) are more reliable. The t-values in parentheses below the coefficient suggest that none of these estimates are significantly different from unity. This is precisely what one would expect from the national income accounting identity: $S - I \equiv CAB$.

It will be noticed that the coefficients of *CAB/Y* in (8) and (11) are much smaller than the corresponding coefficients of *S/Y* and *I/Y* although in principle all should be equal to unity in absolute value. One possible reason this could happen is if there were some errors of measurement of the variables.[14] It is well known that current and capital account data contain large errors. Indeed, the statistical discrepancy term in the balance of payments which sums up measurement errors and omissions can frequently be larger than the current (capital) account deficit or surplus.[15] This could bias the estimates of the coefficients in (8) and (11).

To demonstrate the estimation bias, rewrite (3) as follows:

$$\text{(3a)} \qquad i = \alpha + \beta c + \gamma s + \varepsilon$$

where $i = I/Y$, $s = S/Y$, and $c = CAB/Y$ are the true ratios. But the observed ratios diverge from the true ratios due to measurement errors. Let the observed ratios be:

$$i' = i + v, \quad s' = s + u_1, \; and \; c' = c + u_2$$

where $E(v) = E(u_1) = E(u_2) = E(vu_1) = E(vu_2) = E(u_1 u_2) = 0$ and $var(v) = \sigma_v^2$, $var(u_1) = \sigma_1^2$ and $var(u_2) = \sigma_2^2$. Without any loss of generality, the observed variables are normalised such that $var(c') = var(s') = 1$.

Let $cov(c', s') = \rho$, and $\dfrac{var(u_1)}{var(s')} = \lambda_1$, $\dfrac{var(u_2)}{var(c')} = \lambda_2$ and $var(\varepsilon + v) = \sigma^2$.

When the observed values are substituted into (3a) we get,

$$\text{(13)} \quad i' = \alpha + \beta c' + \gamma s' + e$$

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[14] Baxter and Cruccini (1993) also discusse the problem of divergence between the usual measure and the 'true' measure of saving.

[15] Goodhart (1989) reports that the balancing item in the UK balance of payments was much larger than the current account balance in four out of six years during 1983-88. In 1986, the balancing item was 110 times larger than the current account balance. In Australia the balancing term in the capital account was about a quarter of the capital account surplus in 1989.

where $e = \varepsilon + v - \beta u_1 - \gamma u_2$. It can be shown that the probability limits of the least square estimators are:

$$(14) \quad plim\ \hat{\beta} = \beta - \frac{\lambda_2\beta - \rho\lambda_1\gamma}{1-\rho^2}$$

$$(15) \quad plim\ \hat{\gamma} = \gamma - \frac{\lambda_1\gamma - \rho\lambda_2\beta}{1-\rho^2}$$

The estimators are accordingly biased and inconsistent. Since the true value of β and γ are unity, we could rewrite the equations above as:

$$(16) \quad plim\ \hat{\beta} = 1 - \frac{\lambda_2 - \rho\lambda_1}{1-\rho^2}$$

$$(17) \quad plim\ \hat{\gamma} = 1 - \frac{\lambda_1 - \rho\lambda_2}{1-\rho^2}$$

It is not unambiguous whether the bias in the estimates is upward or downward. If it is assumed that the variances of measurement errors u_1 and u_2 are the same, we would have, $\lambda_1 = \lambda_2 = \lambda$, say. Then,

$$(18) \quad plim\ \hat{\beta} = plim\ \hat{\gamma} = 1 - \frac{\lambda}{1+\rho}$$

Since λ is positive and $0 < \rho < 1$, both estimates would be biased downward under the condition above.[1] The downward bias remains if λ_1 and λ_2 are not very different in magnitude and ρ is small. Thus errors in the measurement of the variables could also lead to an underestimation of the coefficients of the regression equations reported earlier.

[1] From the OECD data, cov(s′,c′) = 0.000461 when the variables are defined as ratios of GDP, and cov(s',c')=0.000457 when they are defined as ratios of GNP.

The errors of measurement of the left side variable does not affect the estimates of the regression coefficients. If it can be reasonably assumed that the investment variable (i') is measured with fewer or no errors, we can get better estimates of the coefficients by transposing i' to the right side and s' to the left side of the regression equation:

(19) $s' = \alpha + \beta c' + \gamma i' + \varepsilon$

A smaller measurement error of i' also implies that λ_1 (which now represents the ratio *var (v)/var(i')*) is small and perhaps negligible. Furthermore, calculations using OECD data show that the covariance between i' and c' is also very small and only about one-sixth the magnitude of covariance between s' and c'.[16] Hence, the value of ρ (which now represents covariance between i' and c') would be very small and tending to zero. Therefore, we have,

$$plim\ \hat{\beta} \approx 1 - \frac{\lambda_2}{1-\rho^2} \approx 1 - \lambda_2$$
$$plim\ \hat{\gamma} \approx 1 + \frac{\rho\lambda_2}{1-\rho^2} \approx 1 - \rho(bias\ in\ \hat{\beta})$$

The probability limit of the estimate of the investment coefficient is biased upward. However, if the value of ρ is very small, as is the case with the OECD data set used for this study, the investment coefficient would be unbiased. The current account balance would be biased downward so long as λ_2 is not insignificant. Recall that the estimate of the coefficient of i' in (11) is indeed very close to unity, but that of c' is lower. Therefore, it would seem that regression equation (11) provides some support for the arguments advanced in the paper.

The variables above have been defined as ratios of GDP. If instead they are defined as ratios of GNP, the results undergo minor quantitative changes, but the qualitative results are not affected as should be evident from Table 1. The coefficients of current account and investment ratios are insignificantly different from unity (and significantly different from zero). We get better estimates

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[16] cov(i', c') = 0.000077; when the variables are defined as ratios of GNP cov(i',c')=0.0000933.

when *CAB/Y* is included as a variable on the right side, and when *S/Y* is substituted for *I/Y* as the dependent variable.

The same analysis has been repeated for the more recent period 1975-91. The results are reported in Table 2 and Table 3. There are hardly any qualitative differences between these results and that reported above. The first two equations in Table 2 and 3 are similar to what has been reported by a number of authors (eg. Frankel 1991, Summers 1988, and Tesar 1991). The coefficient of the saving ratio is significantly less than unity and also lower than the coefficient derived from the earlier period.[17] A quantitative difference between these equations and those pertaining to the earlier period is that the coefficient of the current account variable when the saving ratio is the dependent variable is almost unity in contrast to the earlier estimates. One plausible explanation is that perhaps fortuitously the terms in the denominator of the right side expression in equation (14) cancel each other out. Another possible reason is that the errors of measurement are likely random, and averaging over the long span of seventeen years eliminates whatever errors there are in the yearly observations.

IV.

A smaller value of the saving coefficient has been commonly associated with a greater mobility of capital across international borders. But the analysis above suggests that a low value of the saving coefficient could be due to a misspecification of the regression equation and errors in the empirical measurement of variables. It has been further demonstrated that a high value (near unity) of the saving coefficient could be consistent with both high and little mobility of capital contradicting the claim that such a value unambiguously implies immobility of capital across borders. Since it is possible for the index to change without any change in the international capital market conditions, its use as an index of capital mobility is circumscribed.

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[17] This need not imply a greater integration of the world capital markets in the later period as the application of the FH criterion would suggest. Neither can such results be used to imply that there was no greater integration of the capital markets in the more recent years.

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Table 1: Regression results with variables as ratios of GNP
OECD: 1960-1974

Regressand	Regression	$\bar{R}^2$	F	AIC
I/Y	0.093 + 0.655 S/Y (0.025)* (0.099)*	0.694	44.03	0.000488
I/Y	0.068 + 0.732 S/Y - 0.406 CAB/Y (0.026)** (0.098)* (0.198)**	0.740	28.06	0.000432
CAB/Y	-0.028 + 0.064 I/Y (0.064) (0.150)	-0.040	0.184	0.000680
S/Y	-0.027 + 1.084 I/Y (0.043) (0.163)*	0.694	44.03	0.000808
S/Y	-0.0098 + 1.045 I/Y + 0.605 CAB/Y (0.037) (0.140)* (0.219)**	0.776	33.90	0.000616
S/Y	0.262 + 0.769 CAB/Y (0.012)* (0.438)***	0.099	3.09	0.00238
	S = Gross National Saving I = Gross Domestic Investment (total) CAB=Current Account Balance, Y=GNP	* significant at 1% level	** significant at 5% level	*** significant at 10% level

Table 2: Regression results with variables as ratios of GDP
OECD: 1975-1991

Regressor ⇒ / Regressand ⇓	Constant	S/Y	I/Y	CAB/Y	$\bar{R}^2$	F-ratio	AIC
I/Y	*0.141* *(0.022)**	*0.426* *(0.106)**			*0.442*	*16.04*	*0.00063*
I/Y	*0.124* *(0.024)**	*0.492* *(0.111)**		*0.479* *(0.308)*	*0.483*	*9.86*	*0.00061*
CAB/Y	*0.012* *(−0.031)*		*0.015* *(0.137)*		*−0.055*	*0.013*	*0.00040*
S/Y	*– 0.051* *(−0.063)*		*1.107* *(0.276)**		*0.442*	*16.04*	*0.00164*
S/Y	*−0.039* *(0.056)*		*1.092* *(0.246) **	*1.018* *(0.424) ***	*0.558*	*13.01*	*0.00135*
CAB/Y	*−0.036* *(0.016)***	*0.138* *(0.078)****			*0.099*	*3.109*	*0.000341*

Table 3: Regression results with variables as ratios of GNP
OECD: 1975-1991

Regressand	Regression	$\bar{R}^2$	F	AIC
I/Y	0.155 + 0.377 S/Y (0.027)* (0.131)*	0.279	8.351	0.00083
I/Y	0.134 + 0.457 S/Y - 0.557 CAB/Y (.029)* (0.133)* (.328)***	0.348	6.059	0.00078
CAB/Y	0.005 - 0.057 I/Y (0.033) (0.142)	-0.046	0.164	0.000441
S/Y	0.0088 + 0.84 I/Y (0.068) (0.269)*	0.279	8.35	0.00185
S/Y	0.004 + 0.899 I/Y + 1.016 CAB/Y (0.061) (0.261)* (0.431)**	0.424	8.002	0.00154
CAB/Y	-0.038 + 0.144 S/Y (0.019)*** (0.089)	0.077	2.588	0.000389

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