### **Response to referee report #2**

#### Comments on non-stationarity in the data

The referee takes to us to task for not testing for non-stationarity in the data, and for not modelling non-stationarity when appropriate.

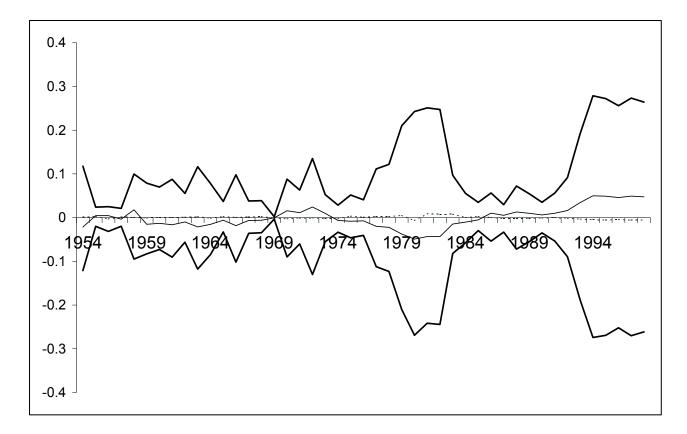
Yet there is a good reason we did not: the literature has often chosen to ignore the issue of non-stationarity, either by not testing for it or by ignoring the results of its own stationarity tests if needed. For example, to quote from Gruber (2004) (JME vol.51, p. 1502): "Unit root tests reveal that in many cases the hypothesis of non-stationarity in CA cannot be rejected. However, the analysis in this paper continues under the assumption that the series  $\Delta$ NO (ie. our  $\Delta$ Y) and CA are stationary." Why would the literature "dodge" this issue? The reason is that the model-predicted current account is without doubt stationary (because it is the present discounted value of expected income declines, which are stationary). Hence, if the actual current account is non-stationary, there is little point in testing whether the model is a good representation of the data; moreover, any talk about whether the predicted current account is closely orrelated with or more or less volatile than the actual current account would be non-sense, since one series would be I(0) and the other I(1). Note that, in our opinion, this is one strength of our argument: that short-sample inference about the relationship between actual and predicted series is bound to fail even if such inference has statistical meaning (ie. even if the actual current account is truly stationary).

This being said, to give the referee concrete proof that our results are not driven by the presence of unit roots, we re-estimated the model using Belgium annual data (which the referee finds to be non-stationary) but with the current account and income changes now scaled by GDP. This is a simple but effective way to account for possible non-stationarity in the current account, because the current account cannot have a unit root if expressed as a share of GDP: otherwise, a country could potentially save/borrow infinitely in relation to its income.

What do we find when doing this? Basically, nothing changes relative to the findings in the paper. The VAR companion matrix still has a large eigenvalue, but it is now short of a unit root (the largest eigenvalue is 0.91). The *F*-test still cannot reject the model (its *p*-value is 21.6%, against 36.7% in the paper). The *p*-value for the non-linear Wald test however drops dramatically to 1.6% (from 96.9% in the paper). In other words, the non-linear Wald test now rejects the model at 95% confidence when it was (strongly) accepting it before, further illustrating our point that this test is unrobust in short samples.

Just as in the paper, the predicted current account is very imprecisely estimated as can be seen in the graph, with very wide confidence bands. And given that the dispersion of the

correlation coefficient and variance ratio is related to the width of the bands, no robust statement can be made about these statistics either.



Graph. Belgium, 1953-98: Actual ( - ), Predicted (--), and Confidence Bands (Bold).

#### Comments on the construction of the data

a) Per the referee's request, we have plotted the data at the end of this note.

b) Graph units are not very intuitive because data are in real, per capita terms and they are de-meaned. We use real GDP (in 1995 or 1996 terms, depending on the country) together with base year nominal GDP to construct a GDP deflator. We then use the GDP deflator to convert all other IFS series (which are nominal) in real terms. Dividing by population leads to real variables per capita. Finally, we remove the mean from  $CA_t$  and  $\Delta Y_t$ , as has been standard practice in the literature (we only test the dynamic restrictions of the theory). Removing the means makes graph units less intuitive.

c) We choose VAR lags using the Akaike information criterion, but our results are robust to changes in the number of lags used (we can provide the referee with results using alternative

lags). The variables used in the VAR are absolutely standard, this is the VAR used in most or all papers in this literature.

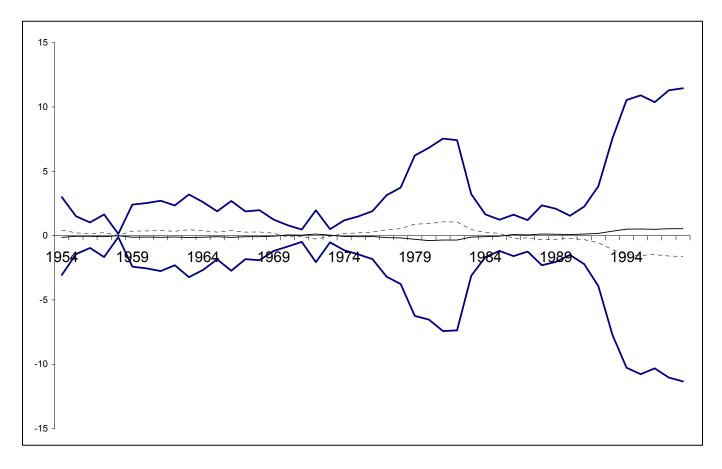
d) Yes, the analysis is intended with income in non-log form. As far as we know, no paper computes the data in log form. The reason is that putting data in log form would make income changes equal (approximately) to the growth rate, with very unintuitive mapping into the model definition of the current account.

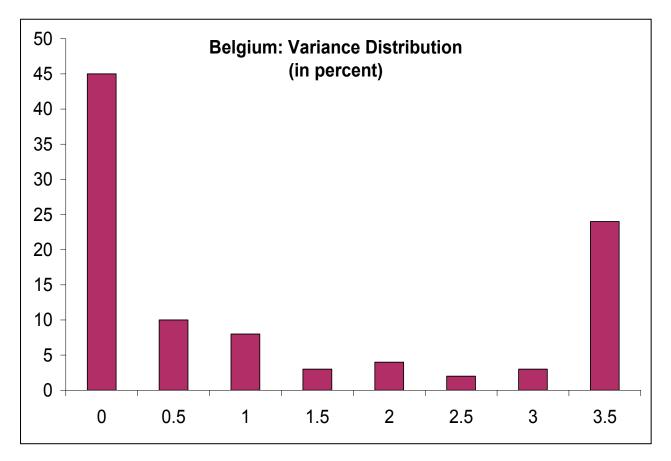
#### **Minor comments**

a) As the referee points out, Belgium data has an outlier. We have re-estimated the model setting the value of the outlier to 0, and our results are robust to removing the outlier.

In particular, the *F*-test still cannot reject the model (its *p*-value remains relatively unchanged, now 43.5% against 36.7% previously). However, the *p*-value for the non-linear Wald test drops dramatically from 96.9% to 20.1%, further illustrating how "fickle" and unreliable this test is. Finally, the predicted current account is still very imprecisely estimated, with very wide bands (see below).

# Graph. Belgium, 1953-98 (outlier removed): Actual ( - ), Predicted (--), and Confidence Bands (Bold).





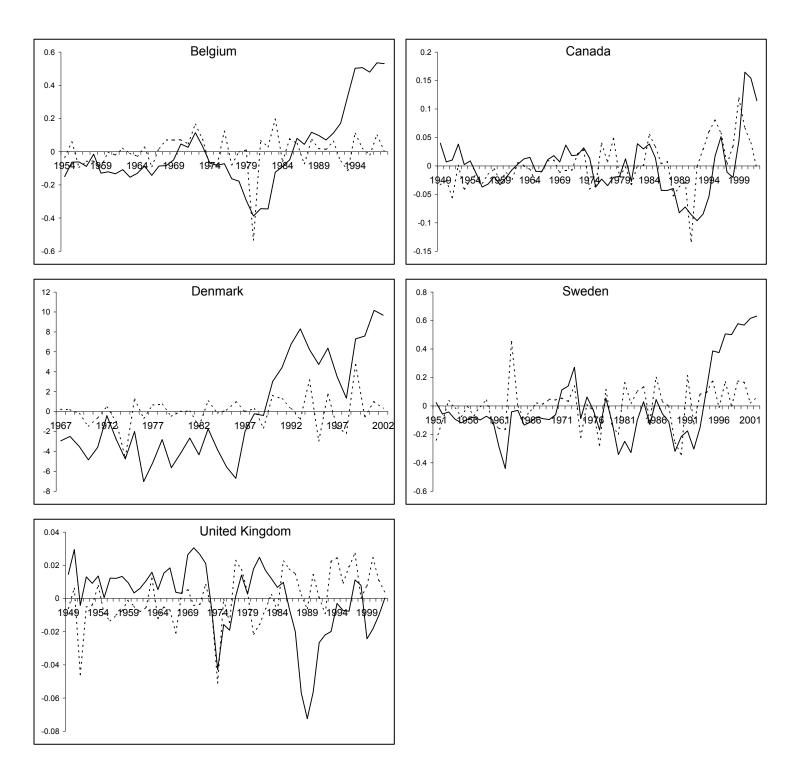
Related to this, the estimated variance ratio is still very imprecise, as the graph below illustrates.

b) Regarding the comment on the normality of the residuals, and why this is the appropriate assumption, we refer the referee to our footnote 15:

<sup>15</sup> We cannot reject the null of joint normality of the residuals at a 95% confidence level in any of the annual samples. In quarterly data, we can only reject it for Sweden. We do not detect serial correlation in any of the residual series. In the case of the UK quarterly data we generate 5,000 draws for computational reasons.

c) The distribution we take expectation with respect to in equation (1) is all the information economic agents have at time *t*. The present value model of the current account implies that the current account should contain all the relevant information the agents have to form their expectations of future  $\Delta Y_t$ . As a consequence, we only need to include the current account in the VAR used to estimate future  $\Delta Y's$ . The model therefore implies that the distribution of  $X_t$  contains all the relevant information agents use to form their expectations in equation (1).

d) We could certainly replace *CA* with a single letter symbol different from *C* and *A*.



## Graph of the annual data: $CA_t$ (-) and $\Delta Y_t$ (--)