CURRENT ACCOUNT DEFICITS IN THE TRANSITION ECO-NOMIES

Mark J. HOLMES *

Abstract:
This study tests for the stationarity and sustainability of current account deficits for ten transition economies. For this purpose, a new test is employed that allows one to test for unit roots in heterogeneous panel datasets. While the benefits from creating a panel to overcome low test power are well known, this test also offers key advantages over existing alternative panel data unit root tests: it is able to identify which members within the panel are responsible for rejecting the null hypothesis of joint non-stationarity. In addition, the SU-RADF test does not presume disturbances that are independently and identically distributed. Using data covering 1993 – 2001, this study finds strong evidence in favour of current account mean-reversion for six countries. Of the six countries in the sample that joined the European Union in May 2004, non-stationarity was confirmed in the case of Lithuania only.

1 . I n t r o d u c t i o n

The stationarity and sustainability of current account balances has been the focus of many researchers over a number of years (see, *inter alia*, Trehan and Walsh, 1991; Gundlach and Sinn, 1992; Otto, 1992; Wickens and Uctum, 1993; Liu and Tanner, 1996; Wu, 2000 and Wu et al., 2001). These studies have provided mixed conclusions with respect to case studies involving subsets of the OECD countries. The purpose of this paper is to assess whether or not the current account deficits of the transition economies exhibit stationarity and are therefore sustainable in the long- run. For this purpose, a new panel data unit root test that offers key advantages over existing univariate and alternative panel data unit root tests is applied to a sample of ten transition economies. [1]

---

*) Loughborough University, Loughborough LE11 3TU, United Kingdom (e-mail: M.J.Holmes@Lboro.ac.uk).

1) Bulgaria, the Czech Republic, Hungary, Poland, the Slovak Republic, Estonia, Lithuania, Romania, Russia, Ukraine.

There are several important reasons of interest attached to this study. First, a sustainable current account is consistent with the sustainability of external debts and might indicate there is no incentive for a country to default. Temporary current account deficits are not necessarily "bad" as they reflect the reallocation of capital to countries where capital is more productive. However, persistent deficits are more serious. They may lead to increased domestic interest rates to attract foreign capital and, in addition to this, the accumulation of external debt owing to persistent deficits will imply increasing interest payments that impose an excess burden on future generations.

Second, the sustainability of the current account is consistent with the intertemporal model of the current account, and hence supports its validity (see, for example, Husted, 1992). The modern intertemporal model of current account determination uses consumption smoothing behaviour to predict that the current account acts as a buffer to smooth consumption in the face of shocks. This implies that exports and imports should be cointegrated with a coefficient of unity.

Third, this is the first study that conducts a formal analysis of current account stationarity using a panel of transition economy current account deficits. As argued below, the majority of the existing literature has focused on the OECD countries.

Fourth, this study is of interest from the point of view of those countries that seek, or have been granted, accession to the European Union (EU). If unsustainable current account deficits have implications for debt default then there will be implications for the stability of the EU in general as well as stability of the single currency. [2] The sample of countries employed in this study includes six countries that joined the EU in May 2004.

The formal examination of the sustainability of transition economy current account deficits in general is a relatively unexplored area. In an interesting paper, Roubini and Wachtel (1998) consider factors that determine sustainability in relation to the transition economies namely, capital flows influencing the choice of exchange rate regime which in turn leads to a real appreciation of the exchange rate and a worsening of the current account. Also, one needs to acknowledge relatively weak banking and financial systems, large fiscal imbalances, low foreign reserves, increasing foreign debt and foreign debt-burden ratios. Bearing in mind the earlier work of Roubini and Wachtel (1998), the contribution of this paper is to offer a more formal assessment of current account sustainability for the transition economies. Early studies that investigate the stationarity of the current account deficit have largely concerned the OECD countries and include, *inter alia*, Trehan and Walsh (1991) and Wickens and Uctum (1993) who look at the USA, Otto (1992) who looks at the USA and Canada, Liu and Tanner (1996) who examine the G7 countries, and Gundlach and Sinn (1992) who examine a larger sample of twenty three countries. These studies generally found that current accounts are non-stationary for several major industrialized countries. More recently, however, Wu (2000) and Wu, Chen and Lee (2001) confirm sustainability of the OECD current account deficits using panel data unit root and cointegration tests. [3] These panel approaches use more obser-

---

2) Earlier work that focuses on the impact of transition economy current account deficits includes, *inter alia*, Krkoska (2001), who points to the danger associated with the growing gap between the current account deficit and foreign direct investment in Central European transition-accession countries. Also, Horváth (1999) examines the role of the current account deficit in the 1997 Czech currency crises. While Ohr (1998) shows that an overvalued currency resulting in a high and growing current account deficit which is financed by short- run capital imports must be taken as a serious warning signal of an impending currency crisis.

3) There are a limited number of studies that concern less developed countries (LDCs). For example, Pattichis and Kanaan (2001) found that the trade balance is stationary and therefore sustainability in the

vations and exploit the cross-country variations of the data in estimation thereby yielding higher test power than standard unit root tests based on individual time series. Given that low test power could be responsible for acceptance of the non-stationary null, the application of panel data unit root tests makes it increasingly likely that stationary can be confirmed.

A potential problem with respect to investigating current account stationarity with respect to transition economies is limited data. Across most transition economies, the earliest data concerning current account balances starts in the early 1990s. In this study panel data unit root tests are applied to annual data on current account deficits. However, an additional novel approach of this paper is to employ a new test panel data unit root test, advocated by Breuer et al. (2002), that estimates augmented Dickey-Fuller (ADF) regressions within a seemingly unrelated regression (SUR) framework in the search for current account stationarity. This SURADF test offers two crucial advantages over existing panel data unit root tests, such as the tests employed by Coakley et al. (1999) and Wu (2000). First, the SURADF test enables the researcher to identify how many and which series within the panel are responsible for rejecting the null of non-stationarity and second, the SURADF procedure is able to handle contemporaneous correlation among the series in the panel.

The paper is organized as follows. The following section discusses the background literature on panel data unit root testing and highlights the advantages of the SURADF procedure. The third section reports and discusses the results. The application of univariate ADF unit root testing indicates that only two out of ten transition economies are characterized by current account stationarity. However, the application of the SURADF procedure is able to identify stationarity in four additional cases. The final section concludes.

2. Testing for Stationarity in Panel Datasets

This study evaluates current account sustainability on the basis of unit root testing. Husted (1992) provides a simple small open economy framework whereby a long-run relationship between exports and imports characterized by homogeneity, implies current account sustainability. Let's suppose an optimising representative individual, who is able to borrow and lend in international financial markets at a given world rate of interest, faces the following current-period budget constraint

$$C_0 = Y_0 + B_0 - I_0 - (1 + r_0)B_{-1} \tag{1}$$

where C_0, Y_0, B_0 and I_0 refer to current consumption, income, borrowing and investment, r_0 is the one-period current world interest rate which is assumed to be stationary with an unconditional mean r and $(1 + r)B_{-1}$ is the initial debt size. Equation (1) should hold in every time period and can therefore be solved forwards to derive

$$B_0 = \sum_{t=1}^{\infty} \psi_t (X - MM)_t + \lim_{n \to \infty} \psi_n B_n \tag{2}$$

where $Y_t - C_t - I_t = (X - MM)_t$ is the trade balance (exports expenditure minus imports expenditure) and ψ_t is the discount factor defined as the product of the first t values of $\lambda_0 = 1/(1 + r_0)$. This is the intertemporal budget constraint (IBC) where the present value of future trade surpluses is equal to the amount a country borrows or

---

case of Lebanon while Coakley and Kulasi (1997) confirm likewise for India but not Korea and Taiwan. Coakley et al. (1999) look at the case of LDCs using panel data unit root techniques.

lends in international financial markets. Husted uses this model to derive a testable equation. Let

$$Z_t + (1 + r)B_{t-1} = X_t + B_t \tag{3}$$

where $Z_t = MM_t + (r_t - r)B_{t-1}$. Solving forwards yields

$$MM_t + r_t B_{t-1} = X_t + \sum_{j=0}^{\infty} \lambda^{j-1}\left[\Delta X_{t+j} - \Delta Z_{t+j}\right] + \lim_{n\to\infty} \lambda^{t+j} B_{t+j} \tag{4}$$

where $\lambda = (1/(1 + r))$ and $MM_t + rtB_{t-1}$ represents expenditure on imports plus interest payments on net foreign debt. Let's assume that expenditure on exports and imports are both non-stationary processes

$$X_t = a_1 + X_{t-1} + e_{1t} \tag{5}$$

$$Z_t = a_2 + Z_{t-1} + e_{2t} \tag{6}$$

Substitute (5) and (6) into (4) and rearrange:

$$X_t = \alpha + \left(MM_t + r_t B_{t-1}\right) - \lim_{j\to\infty} \lambda^{t+j} B_{t+j} + \mu_t \tag{7}$$

where $\alpha = [(1 + r^2)/r](a_2 - a_1)$ and $\mu_t = \sum \lambda^{j-1}\left(e_{2t} - e_{1t}\right)$. Finally, I can write

$$X_t = \alpha + \beta M_t + \mu_t \tag{8}$$

where $M_t = MM_t + r_t B_{t-1}$ and it is assumed that $\lim_{j\to\infty} \lambda^{t+j} B_{t+j} = 0$. The sustainability of the current account concerns the validity of existing and future exports and imports. The current account balance is said to be unsustainable if exports and imports will lead to the violation of the intertemporal budget contraint. In this case, there may be a need for the government to change policy and engage in corrective action. If the current account balance is stationary, the implication is that with unchanged policies, the current account balance will not grow without limit where the discounted deficit will converge asymptotically to zero. Imposing $\beta = 1$ and identifying stationarity of the current account is therefore sufficient for sustainability.[4]

This study tests for the stationary of transition economy current account balances within a panel framework. Let's define the current account balance for country i, d_{it}, as

$$d_{it} = X_{it} - M_{it} \tag{9}$$

where X and M are both expressed as a proportion of gross domestic product (GDP), $i = 1, 2,… N$ countries and $t = 1, 2,… T$ time periods. Let's suppose dit is generated by a first order autoregressive process, $d_{it} = \kappa_i + \rho_i d_{it-1} + \omega_{it}$ which can be transformed into the familiar ADF regression

---

4) Alternatively, it might be suggested that the necessary and sufficient conditions for sustainability may be weaker, namely that exports and imports are cointegrated, with the cointegrating vector (-1, β) where $\beta \leq 1$. However, if $\beta < 1$ the current account is non-stationary and can grow unbounded giving governments the incentive to default on ever-growing international debts. Clearly, there are parallels with the debate over budget sustainability where Trehan and Walsh (1988, 1991) consider the relationship between stationarity and sustainability of the budget deficit while Hakkio and Rush (1991) consider cointegration between revenues and expenditures.

$$\Delta d_{it} = \kappa_i + \tau_i d_{it-1} + \sum_{j=1}^{k_i} v_{ij} \Delta d_{it-j} + \omega_t \tag{10}$$

where $\tau_i = \rho_i - 1$. Acceptance of the null hypothesis $\tau_i = 0$ ($\rho_i = 1$) means that d_{it} is a non-stationary series whereas rejection of the null means that d_{it} is stationary and therefore the current account balance exhibits long-run sustainability. There exist a range of panel data unit root tests that offer increased power over methods for univariate unit root testing. These methods are summarized in Table 1.

Table 1
Summary of Panel Data Unit Root Tests

Test	Hypotheses	Estimation	Lag structures in the N series	Allowance for contemporaneous cross correlation	Identification of individual stationary series
Abuaf and Jorion (1990)	ρ_i identical across panel under H_0 and H_1	Fixed effects panel estimation	None	No	No
Levin and Lin (1993)	ρ_i identical across panel under H_0 and H_1	Fixed effects panel estimation	Homogeneous	No	No
Im, Pesaran and Shin (1997)	ρ_i differs across panel under H_0 and H_1	OLS estimation. Average of t statistics across panel	Heterogeneous	No	No
Maddala and Wu (1997)	ρ_i differs across panel under H_0 and H_1	OLS estimation. Average of p-values across panel	Heterogeneous	No	No
Papell (1997)	ρ_i identical across panel under H_0 and H_1	Fixed effects panel estimation	Heterogeneous	No	No
O'Connell (1998)	ρ_i identical across panel under H_0 and H_1	GLS	Homogeneous	Yes	No
Sarno and Taylor (1998)	ρ_i differs across panel under H_0 and H_1	SUR estimation to compute multivariate ADF statistic	Heterogeneous	Yes	No
Wu and Wu (1998)	ρ_i differs across panel under H_0 and H_1	SUR estimation to compute average t statistic	Heterogeneous	Yes	No

The early tests proposed by Abuaf and Jorion (1990) and Levin and Lin (1993) offer restrictive joint and null hypotheses where all in the panel series are either non-stationary or stationary where all members of the panel have common autoregressive parameters, i.e. ρ's or β's. In addition to this, Abuaf and Jorion (1990) set k at zero and do not feature a lag structure. Levin and Lin (1993) on the other hand, incorporate $k = 0$ but k is given the same value for all panel members. Papell (1997)

allows *k* to vary across all members but, in common with the earlier panel-based tests, does not allow for contemporaneous cross-correlation of the $\varepsilon_{i,t}$'s. O'Connell (1998) argues that panel data unit root tests that presume identically and independently distributed disturbances can have dramatic implications for statistical size and power to the extent that the null may not be correctly accepted or rejected. To allow for correlation across the panel, Im, Pesaran and Shin (1997, 2003) assume that

$$\varepsilon_{it} = \theta_t + u_{it} \tag{11}$$

where θ_t is a time-specific common effect that allows for a degree of dependency across the series and u_{it} is an idiosyncratic random effect that is independently distributed across groups. To remove the effect of the common component θ_t, I can subtract the cross-section means from the panel of real exchange rates. However, this demeaning procedure only partially tackles cross-sectional dependence. O'Connell (1998) controls for contemporaneous correlation directly by estimating the disturbance covariance matrix and so allows for contemporaneous cross correlation but forces the lag structure to be homogeneous. With the exception of Im, Pesaran and Shin (1997, 2003) and O'Connell (1998), none of the above tests allow for a mixture of stationary and non-stationary series in the panel because they impose a common value for the autoregressive parameter in the null and alternative hypotheses. The remaining tests by Maddalla and Wu (1997), Wu and Wu (1998) and Sarno and Taylor (1998) do allow for this mixture. Most of these latter studies address the issue of heterogeneous lag structures and contemporaneous correlation of the residuals, but they still provide a single test statistic that does not allow the researcher to identify how many and which of the series in the panel are in fact stationary.

This paper utilizes the alternative test procedure recently advocated by Breuer et al. (2002) that exploits the power of panel data analysis without imposing uniformity across the panel under either the null or alternative hypothesis. This test relies on SUR analysis with no across panel restrictions under either hypothesis. While this test offers increased power over univariate ADF tests especially when residual cross-correlations are high, there are three further advantages. First, more information is exploited through knowledge of the cross-equation error covariances to produce efficient estimators and potentially more powerful test statistics. Second, autoregressive processes of varying orders can be incorporated. Third, the researcher can identify which panel members are stationary or non-stationary because, unlike the previous tests, the SURADF test is based on individual rather than joint hypotheses. The SURADF test involves non-standard distributions therefore critical values must be obtained through simulation. These critical values are specific to the estimated covariance matrix, sample size, number of panel members and lag structure.

3. Results

The countries used in this study are Bulgaria, the Czech Republic, Estonia, Hungary, Lithuania, Poland, Romania, Russia, the Slovak Republic and Ukraine. All data are taken from the *World Development Indicators* via the World Bank database. The study employs annual data for these ten transition economies over the study period 1993 – 2001 inclusive. It is acknowledged that quarterly data are available for some of these countries over a shorter time span. In selecting the dataset employed in this study, it should be remembered that the SURADF procedure requires a balanced panel and that earlier studies by Perron (1991) and Shiller and Perron (1985) have argued very effectively that increasing the span rather than the frequency of the

dataset is a much more effective means of improving cointegration test consistency. Table 2 and Figure 1 provide an insight into how the current account deficits have behaved over the study period. Table 2 reveals a diverse set of experiences with respect to individual countries. With the exception of Russia, one can see that all the sample have experienced an average deficit (as a percentage of GDP) ranging from 0.32 and 2.03 in the Ukraine and Bulgaria respectively to 7.74 to 8.89 in the cases of Estonia and Lithuania respectively. Between 1993 and 2001, five of the

Table 2
Current Account Deficits of the Transition Economies

	1993	2001	Mean
Bulgaria	-6.77	-7.49	-2.03
Czech Republic	0.79	-2.72	-3.06
Estonia	-4.31	-3.77	-7.74
Hungary	-8.21	-2.14	-3.08
Lithuania	-7.81	-5.49	-8.89
Poland	0.98	-3.74	-2.49
Romania	-4.97	-8.1	-6.08
Russia	3.89	12.69	7.96
Slovak Republic	-5.22	-8.46	-4.94
Ukraine	-0.28	1.62	-0.32
All	-3.19	-2.76	-3.07

Note: All data refer to the current account balance expressed as a percentage of GDP. The data in the column headed "mean" are mean values computed across the entire study period of 1993 – 2001. The bottom row provides the mean calculations for the entire sample.
Source: *World Development Indicators*.

Figure 1
Current Account Deficits of Transition Economies
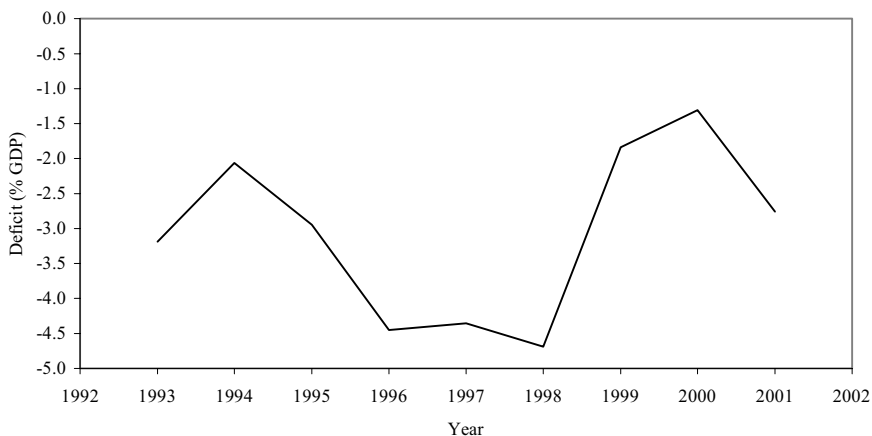
sample countries experienced an improved current account deficit. Figure plots the average deficit across the full sample. It can be seen that the average deficit (as a percentage of GDP) ranges from 1.31 of GDP in 2000 to 4.69 in 1998 where there has been a marked fluctuation in the current account deficit experienced across the entire study period.

The first stage of the empirical investigation is to test for the stationarity of current account balances using the univariate ADF unit root test. Table 3 reports the findings for the full sample of ten countries. [5] At the 5% significance level, I am able to reject the non-stationary null and find in favour of sustainability in two cases, namely Hungary and the Slovak Republic. However, this still leaves the vast majority of the sample characterized by non-stationary and unsustainable current account balances. [6]

Table 3
ADF Unit Root Tests

	ADF (no trend)	ADF (trend)
Bulgaria	-1.222	-9.453***,#
Czech Republic	-2.325	-2.478
Estonia	-0.354	-1.015
Hungary	-4.788***	-2.257
Lithuania	-0.230	0.540
Poland	-2.330	13.457#
Romania	-1.814	-2.032
Russia	0.479	0.404
Slovak Republic	-3.360**	-2.086
Ukraine	-0.404	-0.496#

Note: These tests employ annual data on current account expressed as a percentage of GDP for the study period 1993 – 2001. In all cases, the lag length is selected according to the AIC. *** and ** respectively denote rejection of the non-stationary null at the 1 and 5% significance levels respectively. The 1 and 5 and 10% critical values are -3.58, -2.93 and -2.60 respectively. # indicates significance of the time trend at the 5% significance level.

The second stage of the empirical investigation is to employ panel data unit root testing. The motivation behind this is to employ more observations and exploit the cross-country variations of the data in estimation thereby yielding higher test power than standard unit root tests based on individual time series. Given that low test power could be responsible for acceptance of the non-stationary null in eight of the ten cases reported in Table 3, the application of panel data unit root tests makes it increasingly likely that stationary can be identified. Table 4 reports the findings from two alternative methods that are drawn from Table 1.

_____

5) The lag lengths in these ADF regressions were determined by the AIC subject to a maximum lag length of two years. There was no affect on the qualitative conclusions drawn in this study if alternative methods for lag selection such as the BIC were employed.

6) Table 3 also indicates that the null of non-stationarity is rejected in favour of trend stationarity in the case of Bulgaria. However, trend stationarity does not guarantee sustainability if the current account deficit is moving further away from some mean value.

Table 4
Panel Data Unit Root Tests

Test	Test statistic
Levin and Lin (1993), ρ	0.273
Levin and Lin (1993), $t_{\hat{\rho}}$	-0.984
Levin and Lin (1993), ADF	-1.328*
Im et al. (1997)	-4.701***

Note: The Levin and Lin test statistic is for the null $\rho = 1$ in the panel regression $d_{it} = \rho d_{it-1} + \sum_{j=1}^{k} v_{ij} \Delta d_{it-j} + \omega_{it}$

where d is the current account deficit expressed as a proportion of GDP and the lag lengths are based on the values employed in Table 3 where k was set at a maximum of 2. The Im et al. test statistic is computed as the average ADF statistic across the sample using demeaned data for d. The individual lag lengths for the Im et al. test are based on those employed in the univariate ADF test results reported in Table 3. Both these statistics are distributed as standard normal as both N and T grow large. *** denotes rejection of the null of joint non-stationarity at the 1% significance level. The 1 and 5 and 10% critical values are -2.33, -1.64 and -1.28.

These are the Levin and Lin (1993) and Im et al. (1997) tests that were descri-bed earlier. Each of these statistics is distributed as standard normal as both N and T grow large. The latter test is employed by Coakley et al. (1999) and Wu (2000) in

Table 5
The SURADF Test

	SURADF	1%	5%	10%
Bulgaria	-3.027	-4.039	-3.469	-3.148
Czech Republic	-3.996**	-4.031	-3.464	-3.152
Estonia	-4.335***	-4.106	-3.480	-3.155
Hungary	-12.338***	-4.045	-3.493	-3.169
Lithuania	-0.202	-4.045	-3.147	-3.082
Poland	-6.362***	-4.027	-3.444	-3.123
Romania	-7.704***	-4.083	-3.503	-3.162
Russia	-0.273	-4.070	-3.470	-3.127
Slovak Republic	-9.129***	-4.047	-3.447	-3.121
Ukraine	-1.701	-4.099	-3.487	-3.156

Note: SURADF refers to the ADF statistic obtained through the SUR estimation of ADF regressions for two separate panels of transition economies. One group comprises Bulgaria, the Czech Republic, Hunga-ry, Poland and the Slovak Republic while the other group comprises Estonia, Lithuania, Romania, Russia and Ukraine. The data are current account deficits expressed as a proportion of GDP. Following Breuer et al. (2002), the critical values reported in the three columns on the right have been simulated with 10,000 replications where the error series were generated to be normally distributed with the variance-covariance matrix given by the SUR estimation. Each simulated current account deficit was then generated from the error series using the SUR estimated coefficients. *** and ** indicate rejection of the null of non-stationarity at the 1 and 5% significance levels respectively. The lag lengths in each equation are based on those valu-es employed in Table 3. For each equation, further tests were unable to reject the null that the residuals were serially uncorrelated.

their studies of current account sustainability. One can see that at the 5% significance level or better, only the Im et al. test is able to reject the null hypothesis of joint non-stationarity of the series in the panel. Indeed, this is a strong rejection at the 1% significance level. In the case of the Levin and Lin tests, the null of joint non-stationarity is only rejected in one of the tests if one allows for a generous 10% significance level. However, as with the earlier range of panel data unit root tests, these results are based on a single statistic and are consistent with as little as a single series from within the panel being responsible for rejecting the null hypothesis of joint non-stationarity. These tests do not adequately account for cross equation correlation and in addition to this, the Levin and Lin test is based on the very restrictive alternative hypothesis that the autoregressive parameter is equal across the panel series.

Table 5 reports the findings from the SURADF test applied to the full sample of ten transition economies. This table also reports the 1, 5 and 10% critical values that have been specifically simulated for this panel using knowledge of the variance-covariance matrix of residuals and lag structures across the SUR equations. SUR estimation requires that the number of observations exceed the number of equations. Therefore, the results reported in Table 5 are actually based on the SUR estimation of two separate groups of five equations. One group comprises Bulgaria, the Czech Republic, Hungary, Poland and the Slovak Republic. The other group comprises the remaining countries namely, Estonia, Lithuania, Romania, Russia and Ukraine. [7] As expected, all countries that were stationary and sustainable according to the univariate ADF tests in Table 3, i.e. Hungary and the Slovak Republic, are also stationary according to the SURADF test. However, this time we found out that the non-stationary null is also rejected at 5% significance level or better in a further four cases namely, the Czech Republic, Poland, Estonia and Romania. The SURADF test indicates that a substantially larger proportion of the sample is stationary than was the case of the univariate ADF unit root tests. The average current account deficit (as a percentage of GDP) for the sustainable cases ranges from 2.49 in the case of Poland to 7.74 in the case of Estonia. This confirms that a small deficit does not necessarily guarantee sustainability. While a current account shock may cause a substantial short-run imbalance, there is mean reversion in the long-run suggesting that any increase in external debt resulting from a current account shock might impose an additional burden on current rather than future generations. In addition to this, these findings might also suggest that corrective policies aimed at addressing shocks to the current account, such as exchange rate devaluation, may not be necessary, or may not work, for long-run correction or improvement. The remaining four countries exhibit non-stationary and therefore unsustainable current account deficits, namely Bulgaria, Lithuania, Russia and Ukraine. The Ukraine experienced an average deficit (as a percentage of GDP) of only 0.32 yet the evidence suggests that sustainability is not present. Bulgaria and Lithuania have non-stationarity associated with larger average deficits. The long-run implications for all four countries of current account shocks are far more serious. [8] There is long-run persistence and more likelihood that debt will increase and be an excess burden to future generations. For these countries, at least, there is a pressing need for corrective macroeco-

---

7) The choice of these groups is loosely based on "closeness to stationarity" in Table 3. However, altering the composition of the two groups and applying the SURADF tests in each case made no difference to the qualitative conclusions drawn in this study.

8) Russia is characterized by a non-stationary current account that is in surplus on average. In the event of Russia moving into deficit, the concerns with non-stationarity would still apply.

nomic policies to address the need for tackling adverse shocks to the current account balance. Although in some cases the commercial deficit is partly balanced by current transfers from international organizations, the results reported and discussed here would suggest that these countries will become more reliant on such transfers. Finally, on the basis of the Table 5 results, Lithuania merits more discussion. Lithuania joined the EU in May 2004. From the sample of countries acceding to the EU, Lithuania is the only country with a non-sustainable current account deficit. These results suggest that Lithuania's membership of the EU may have implications for the stability of the EU and euro-area. Roubini and Wachtel (1998), in their assessment of Lithuania's worsening current account balance, reflect on a real exchange rate appreciation following the move to a currency board, large government deficits, and a restructuring of the banking system.

4. Conclusion

For a country's intertemporal solvency condition to hold, the change in the country's obligations to the rest of the world, i.e. its current account deficit, must be stationary. This study offers the first formal test of current account stationary for a panel of transition economies. The novel approach employed in this study is the application of augmented Dickey-Fuller panel data unit root tests within a seemingly unrelated regression framework. While panel data unit root tests offer general advantages of increased power over their univariate counterparts, the seemingly unrelated regression offers clear advantages over existing panel data techniques. These advantages relate to the incorporation of cross equation correlation and the ability to determine which series in panel are responsible to any rejection of the null of non-stationarity. Using annual data over the period 1993 – 2001, the univariate augmented Dickey-Fuller tests suggest that only two from the sample are characterized by a stationary current account deficit and therefore sustainability applies. Application of the seemingly unrelated regression approach suggests that a further four transition economies also exhibit mean reversion in their current account deficits. Overall, these results suggest that over half of the sample (the Czech Republic, Estonia, Hungary, Poland, Romania and the Slovak Republic), are characterized by current account sustainability where the impact of a current account shock on external debt will be short- rather than long- run. The remaining countries in the sample (Bulgaria, Lithuania, Russia and Ukraine) are characterized by unsustainable current account deficits. Clearly, the implications for these countries with respect to increased external debt in the long- run are more serious. In the case of Lithuania, one might reflect upon any implication with respect to the membership in the EU. In each of these latter cases, one potential avenue for future research might be the examination of non-linearities in mean-reversion where persistence depends on the size of current account shocks.

References

Abuaf, N., Jorion, P. (1990), "Purchasing Power Parity in the Long Run." *Journal of Finance*, 45, pp.157-174.
Breuer, J. B., McNown, R., Wallace, M. (2002), "Series-specific Unit Root Tests with Panel Data." *Oxford Bulletin of Economics and Statistics*, 64(5), pp. 527-546.
Coakley, J., Kulasi, F. (1997), "The Cointegration of Long Span Saving and Investment." *Economics Letters*, 54, pp. 1-6.
Coakley, J., Hasan, F., Smith, R. (1999), "Saving, Investment and Capital Mobility in the LDCs." *Review of International Economics*, 7(4), pp. 632-640.

Gundlach, E., Sinn, S. (1992), "Unit Root Tests of the Current Account: Implications for International Capital Mobility." *Applied Economics*, June, pp. 617-620.

Horvath, J. (1999), "The May 1997 Currency Crisis in the Czech Republic." *Post-communist Economies*, 11, pp. 277-298.

Husted, S. (1992), "The Emerging US Current Account Deficit in the 1980s: A Cointegration Analysis." *Review of Economics and Statistics*, 74, pp. 159-166.

Im, K. S., Pesaran, M. H., Shin, Y. (1997), "Testing for Unit Roots in Heterogeneous Panels." University of Cambridge, Department of Applied Economics, Working Paper.

Im, K. S., Pesaran, M. H., Shin, Y. (2003), "Testing for Unit Roots in Heterogeneous Panels." *Journal of Econometrics*, 115, pp. 53-74.

Krkoska, L. (2001), "Assessing Macroeconomic Vulnerability in Central Europe." *Post-communist Economies*, 13, pp. 41-56.

Levin, A., Lin, C. (1993), "Unit Root Tests in Panel Data: Asymptotic and Finite Sample Properties." Unpublished manuscript, University of California at San Diego.

Liu, P., Tanner, E. (1996), "International Intertemporal Solvency in Industrialized Countries: Evidence and Implications." *Southern Economic Journal*, 62(3), pp. 739-749.

Maddala, G.S., Wu, S. (1997), "A Comparative Study of Unit Root Tests with Panel Data and a New Simple Test." Ohio State University, mimeo.

O'Connell, P. (1998), "The Overvaluation of Purchasing Power Parity." *Journal of International Economics*, 44, pp.1-19.

Ohr, R. (1998), "Currency Crises in Emerging Countries – Some Risks for Eastern Europe?" *Hamburger Jahrbuch für Wirtschafts und Gesellschaftspolitik*, 43, pp. 245-268.

Otto, G. (1992), "Testing a Present-Value Model of the Current Account: Evidence from US and Canadian Time Series." *Journal of International Money and Finance*, October, pp. 414-430.

Papell, D. (1997), "Searching for Stationarity: Purchasing Power Parity under the Current Float." *Journal of International Economics*, 43, pp. 313-332.

Pattichis, C., Kanaan, M. (2001), "Is Lebanon's Trade Deficit Sustainable? A Cointegration Analysis." *Economia Internazionale*, 54(1), pp. 49-56.

Perron, P. (1991), "Test Consistency with Varying Frequency." *Econometric Theory*, 7, pp. 341-368.

Roubini, N., Wachtel, P. (1998), "Current Account Sustainability in Transition Economies." Cambridge, MA, NBER, Working Paper No. 6468.

Sarno, L., Taylor, M. (1998), "Real Exchange Rates Under the Recent Float: Unequivocal Evidence of Mean Reversion." *Economics Letters*, 60, pp. 131-137.

Shiller, R., Perron, P. (1985), "Testing the Random Walk Hypothesis: Power Versus Frequency of Observations." *Economics Letters*, 18, pp. 381-386.

Taylor, M., Sarno, L. (1998), "The Behaviour of the Real Exchange Rate during the Bretton Woods Period." *Journal of International Economics,* 46 (2), pp. 281-312.

Trehan, B., Walsh, C. (1991), "Testing Intertemporal Budget Constraints: Theory and Applications to US Federal Budget Deficits and Current Account Deficits." *Journal of Money, Credit and Banking*, May, pp. 423-441.

Wickens, M., Uctum, M. (1993), "The Sustainability of Current Account Deficits: A Test of the US Intertemporal Budget Constraint." *Journal of Economic Dynamics and Control*, May, pp. 423-441.

Wu, J-L. (2000), "Mean Reversion of the Current Account: Evidence from the Panel Data Unit Root Test." *Economics Letters*, 66, pp. 215-222.

Wu, J-L., Chen, S-L., Lee, H-Y. (2001), "Are Current Account Deficits Sustainable? Evidence from Panel Cointegration." *Economics Letters*, 72, pp. 219-224.

Wu, S., Wu, J-L. (1998), "Purchasing Power Parity under the Current Float: New Evidence from Panel Data Unit Root Tests." SUNY at Buffalo, mimeo.