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No. 24

RWI : Discussion P

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No. 24

Published by Rheinisch-Westfälisches Institut für Wirtschaftsforschung, Hohenzollernstrasse 1/3, D-45128 Essen, Phone +49 (0) 201/81 49-0

Editor: Prof. Dr. Christoph M. Schmidt, Ph.D.
ISSN 1612-3565 – ISBN 3-936454-39-6

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Bibliografische Information Der Deutschen Bibliothek
Die Deutsche Bibliothek verzeichnet diese Publikation in der Deutschen Nationalbibliografie; detaillierte bibliografische Daten sind im Internet über http://dnb.ddb.de abrufbar.

ISSN 1612-3565
ISBN 3-936454-39-6

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Abstract
It is unclear whether the exceptionally high U.S. current account deficit can be sustained for a prolonged period. In this paper we approach the topic whether a gradual adjustment or a pronounced reduction of the deficit is likely to occur. We therefore characterize the dynamics of the current account deficit movements by a three-regime Markov-Switching model. Our finding is that it is possible to distinguish a regime of a strong increasing deficit, a just slightly increasing deficit and a regime of a deficit reduction. Furthermore we find that movements of the deficit are asymmetric. Whereas expansions of the current account deficit are long lasting, reductions of the deficit are rather short. This implies that a pronounced reduction is not likely to occur. Secondly we try to uncover determinants of regime shifts of the current account. Applying ordered Logit models we conclude that a combination of U.S. inflation, U.S. investment and share prices predicts pronounced changes in the current account deficit quite reliably.

JEL-Classification: C22, C25, F32

Keywords: Markov-Switching Model, Ordered Logit, Indicators

* Both RWI Essen. The authors would like to thank Dirk Engel, Roland Döhrn, Christoph M. Schmidt, Harald Tauchmann as well as Carmen Marin for helpful comments and suggestions. All correspondence to Torsten Schmidt, Rheinisch-Westfälisches Institut für Wirtschaftsforschung (RWI Essen), Hohenzollernstr. 1-3, 45128 Essen, Germany, Fax: +49-201-8149-200, Email: tschmidt@rwi-essen.de.

1. Introduction

The U.S. current account deficit has recently risen above 5 % of GDP. According to an empirical cross-country study by Freund (2000) this is a level at which the deficit typically reverses. Although reductions in large current account deficits are not necessarily associated with currency crises[1] the adjustment process is typically associated with slowing income growth and a pronounced real depreciation of the home currency (Edwards 2002). Therefore the reversal in the current account deficit seems to be a risk for the medium-term economic perspectives in the United States.[2] On the other hand it is also possible that matters stand differently in the U.S. case, as the dollar is the world's most important reserve currency (McKinnon 2001: 236f.). However, there are doubts that private investors are willing to finance the U.S. current account deficit over a long period (Cooper 2001: 223f.; Brook et al. 2004: 4).

The discussion raises two questions we try to answer in this paper. The first question is how likely a pronounced reversal of the current account deficit is. Therefore to find an answer we describe the dynamics of current account movements by estimating Markov-Switching models. This kind of models has been applied to movements in variables like GDP, interest rates, stock prices and exchange rates (for an overview see Hamilton, Raj 2002). Although it seems to be a promising approach, Markov-Switching models have obviously not been used in the context of the current account balance. Subsequently we investigate whether there are three different regimes in the current account deficit which can be interpreted as contractions, expansions and no-changes of the deficit. Moreover, we ask at which pace the deficit is likely to be reduced and analyze whether the movements are symmetric or asymmetric like in the case of business cycle movements.

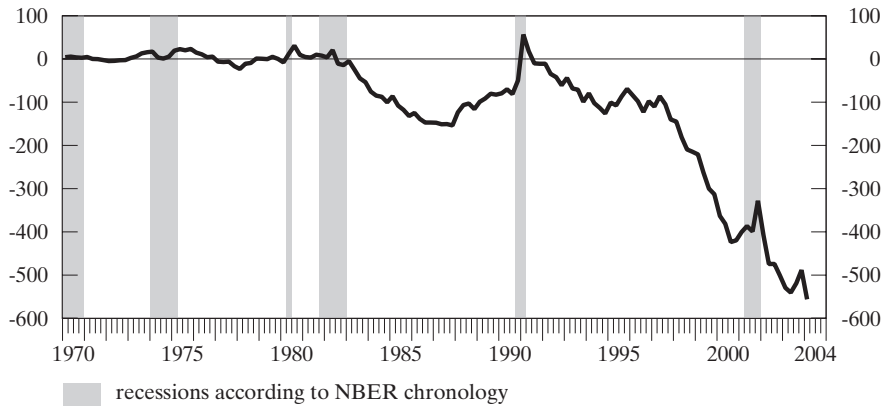
Secondly we try to answer whether these regime shifts are associated with slowing growth rates and a depreciation of the dollar as proposed by Freund (2000). As Figure 1 shows, this seems to be confirmed for the U.S. as reductions of the deficit are likely to occur during economic downturns. In the following we estimate an ordered Logit model to predict regime shifts of the current account deficit using macroeconomic variables that are theoretically related to movements in the current account.

The remainder of the paper is organized as follows. Section 2 establishes the concept of the current account and identifies the main determinants of its movements. In section 3 we use Markov-Switching models to detect the number of regimes in the current account movements. By describing these regimes

1 The discussion is rather controversial. See Fischer (2003) as well as Frankel, Rose (1996).

2 Obstfeld/Rogoff (2004) note that the current situation is similar to the 1970s which would argue for a sharp deterioration of the dollar and a more severe aftermath.

Figure 1
U.S. current account balance
1970:1 to 2004:1; seasonally adjusted annual rate, bn $



Source: BEA.

in more detail we analyze the likelihood of a pronounced reduction of the deficit. In section 4 we use Logit models to relate economic variables like economic growth, the exchange rate, public deficit, interest rates and share prices to regime switches of the current account. Concluding remarks follow in section 5.

2. Economic approaches of the current account

From an accounting perspective, various economic variables are potentially related to movements of the current account deficit. As the current account balance can be defined in different ways, several approaches have emerged explaining its movements (Genberg, Swoboda 1992; Mann 2002). The *international trade approach* relates the path of the current account (CA) to international trade in goods and services and the interest on net foreign assets[3]

$$CA = EX - IM + iF. \tag{1}$$

This approach relates exports (EX) and imports (IM) to domestic and international GDP growth as well as the relative price of goods. If foreign GDP rises or the relative price of domestic goods falls due to a depreciation of the local currency, domestic exports tend to increase and imports tend to decrease. The interest (i) received on net foreign assets (F) can solely compound or attenuate the impact on the current account. The approach highlights the role of

[3] Abstracting from other gratuition payments, e.g. grants.

competition on foreign markets and globalization. The more integrated international goods markets are, the less severe are economic imbalances which become apparent by the current account deficit. However, Obstfeld/Rogoff (2000: 3) argue that most international markets are by far less integrated than domestic markets.

A different approach focuses on the relationship of domestic saving and investment and is therefore called the *saving-investment approach, or fiscal approach*

$$CA = S - I - PD. \tag{2}$$

From this perspective the current account equals the difference between private saving (S) and investment (I) if the public budget (PD) is balanced ($PD = 0$). Stated differently, if investment is accompanied by a similar evolution of private savings, the government budget and the current account behave like "twins" (Poole 2004: 4). The budget deficit tends to raise real interest rates and to crowd out private investment and net exports. This has been the major explanation of the high current account deficit in the early 80s Feldstein (1992) but overall empirical results are mixed. Chinn/Prasad (2003) find support whereas Rahman/Mishra (1992) do not find a significant relation between the two deficits. A negative relation is found for investment by Olivei (2000) as well as Glick/Rogoff (1995) whereas the former also derives a positive connection between saving and the current account deficit. This approach suggests that the deficit will sustain as long as the increasing amount of interest and dividend payments does not dampen domestic consumption or investment. However as Sachs (1981) argues, both savings and investment are based on long-term considerations. Thus, current account movements are necessarily an intertemporal phenomenon and should be no reason for concern at all.

The *financial market approach* relates the current account to the change in net foreign assets

$$CA = \Delta F. \tag{3}$$

In this case the current account deficit is a reflection of the capital account surplus which is underpinned by rapidly growing financial markets and the nowadays high mobility of capital. From this point of view, financial variables such as interest rates and share prices should be the main determinants of the current account and its sustainability depends on the willingness of foreign investors to increase their holdings of U.S. assets.

Each of these competing partial explanations of the current account dynamics may be appropriate under specific circumstances (Mann 2002: 143). Thus each

of them identifies factors which may generate reversals in current account movements.

3. The Markov-Switching models of the current account

3.1 The Model

To investigate the properties of movements in the current account deficit we estimate different types of Markov regime switching models. Because of the non-stationarity of the original series, we use first differences of quarterly data of the U.S. current account deficit. These are useful for analyzing the question whether expansions and contractions in the current account deficit are symmetric or asymmetric. We assume that these fluctuations can be described most suitably by different regimes (S_t) of the first differences of the current account (ΔCA). A priori it is not possible to determine whether these movements can at best be described by two or three regimes. In the widely used two-regime model the first regime ($S_t = 0$) characterizes a decreasing deficit. Thus the mean (μ_0) of the first differences should be positive. The second regime ($S_t = 1$) comprises an increasing deficit, hence the mean (μ_1) should be negative (Figure 2). The large ups and downs of the current account deficit suggests two regimes, though it might be preferable to distinguish phases of an increasing and declining deficit, respectively, from a third regime with no changes. We therefore estimate a two and a three regime model to see which one fits better to the data.

By comparing the means and the durations of the regimes we can conclude whether the movements are symmetric or asymmetric. A short but sharp upward movement of the current account deficit is characterized by a large mean combined with small regime duration. In contrast, a slow and gradual removal of the deficit implies a small mean and large regime duration. By contrast, the regime probabilities should roughly be equal, if the upsurge and decline of the deficit is symmetric.

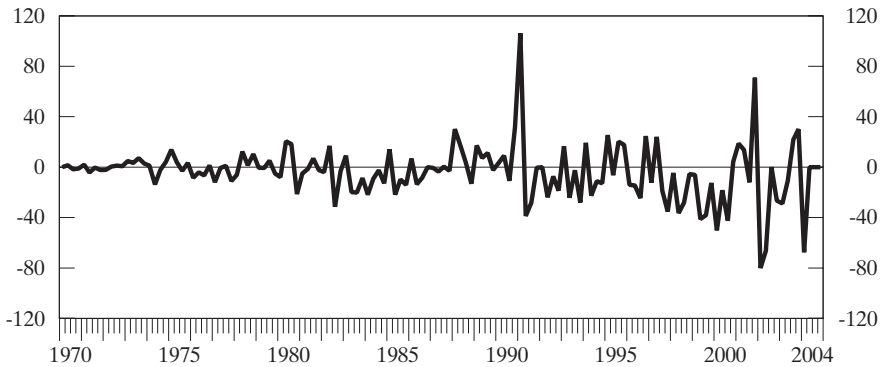
We model the different regimes by different intercepts $\upsilon(S_t)$ which implies a smooth adjustment to the new level after a regime shift (Krolzig 1997: 12)

$$\Delta CA_t = \upsilon(S_t) + \sum_{i=1}^{p} \alpha_i \Delta CA_{t-i} + e_t \tag{4}$$

$$e_t \sim i.i.d.N(0, \sigma_s^2).$$

In specification (4), Δ indicates the first difference of the current account deficit. While the intercept $\nu(S_t)$ is regime dependent, the lagged endogenous variables are not. The variable e_t denotes the error term. In addition, we as-

Figure 2
First difference of the U.S. current account deficit
1970:2 to 2004:1; bn $



Authors' computations.

sume that the unobservable regime variable follows a first order Markov process:

$$P_{jk} = \Pr(S_t = k | S_{t-1} = j) \quad \sum_{k=1}^{3} p_{jk} = 1 \; \forall j, k \in \{1,2,3\}.$$

Consequently, the current state S_t depends on the state of the preceding period S_{t-1}. The probability of switching from one state j to another state k is p_{jk} which is simultaneously estimated with the other parameters of the model. Hence, we assume that the transition probabilities are fixed (Hamilton 1989). To specify the autocorrelation structure we estimate models with different orders of lagged current account deficits and use the Schwarz Criterion to select the appropriate lag length. We will allow however for regime dependent variances (σ_s).

3.2 Estimation Results

The series cover the time period from the first quarter 1975 to the first quarter 2004. A first look at the data suggests that the variance of the series is remarkably lower before 1991 than afterwards (Figure 2). Since the standard approach to correct for heteroscedasticity, working with logarithms of the data, is precluded by the negative entries in the series, we follow Filardo (1994: 302) and divide the pre-1991 observations by the ratios of the standard deviations of the two sub-samples.

Table 1

Estimation Results

	Two-regime model	Three-regime model
Constant (Regime 1)	–9.650**	–36.348***
	(4.221)	(5.369)
Constant (Regime 2)	0.931	–6.648**
	(11.194)	(3.171)
Constant (Regime 3)	–	39.264**
		(17.584)
$\Delta CA(-1)$	0.006	–0.229***
	(0.11)	(0.082)
$\Delta CA(-2)$	–0.003	–0.209***
	(0.101)	(0.075)
Std. Error (Regime 1)	20.37	22.38
Std. Error (Regime 2)	45.12	16.41
Std. Error (Regime 3)	–	32.33
Prob. (Regime 1)	0.65	0.35
Prob. (Regime 2)	0.35	0.50
Prob. (Regime 3)	–	0.15
Duration (Regime 1)	7.72	9.59
Duration (Regime 2)	4.23	5.93
Duration (Regime 3)	–	1.87
Log-Likelihood	–553.85	–545.63
Schwarz's Criterion	9.96	10.07
Davies test	0.0240*	0.0002**

Authors' computations. Standard errors in parentheses. – *Significant at the 10 % level. – **Significant at the 5 % level. – ***Significant at the 1 % level. The MSVAR modul does not report standard errors for the regime variances and the regime probabilities. Davies indicates the significance level of the Davies (1987) test provided by the Krolzig MSVAR modul for Ox, testing the regime switching model against the alternative of a linear model.

The results of the different Markov-Switching models are presented in Table 1.[4] The Davies test (Davies 1987) indicates that it is justified to assume three different regimes for the U.S. current account deficit. The intercept of regime 1 is strongly negative which implies an increasing current account deficit. In regime 3 the intercept is positive which results in a declining deficit. Both intercepts are significantly different from zero. The result holds for different specifications of the lag-structure and different samples. In contrast, the intercept of the second regime is only slightly negative. Thus, regime 2 can be interpreted as the regime of nearly no change of the deficit.

The incidence and expected durations of the three phases, which are calculated from the regime probabilities as

$$D = 1/(1-p_{jk}) \text{ with } j = k$$

4 For the estimation we applied the MSVAR module of Ox provided by Krolzig (1998).

Table2

Transition Matrix

j\k	Increasing deficit (Regime 1)	Unchanging deficit (Regime 2)	Decreasing deficit (Regime 3)
Increasing deficit (Regime 1)	0.90	0.10	0.00
Unchanging deficit (Regime 2)	0.00	0.83	0.17
Decreasing deficit (Regime 3)	0.23	0.30	0.47

Authors' computations.

indicate that movements in the current account deficit are asymmetric: Phases with an increasing deficit (regime 1) are rather infrequent but last for about ten quarters. In contrast, the length of the regime with a decreasing current account deficit (regime 3) is only two quarters while that of the balanced current account regime (regime 2) is six quarters. These results for the U.S. contrast those of a stronger persistence of current account surpluses by Edwards (2004) for a large cross-country study on 157 countries over a time-span of about 30 years.

Correspondingly, the transition probabilities in table 2 indicate that the probabilities of staying in the regime of an increasing deficit (0.90) and of staying in the no-change regime (0.83) are quite high compared to staying in the regime of a decreasing deficit (0.47). Notably, the probability of switching from the increasing deficit to the decreasing deficit regime is nearly zero. The same holds for the transition probability from the no change regime to the regime of an increasing deficit. Thus, if a change in the regime takes place at all, it is most likely to occur in a sequence from an increasing current account deficit via the no-change regime to the decreasing regime.

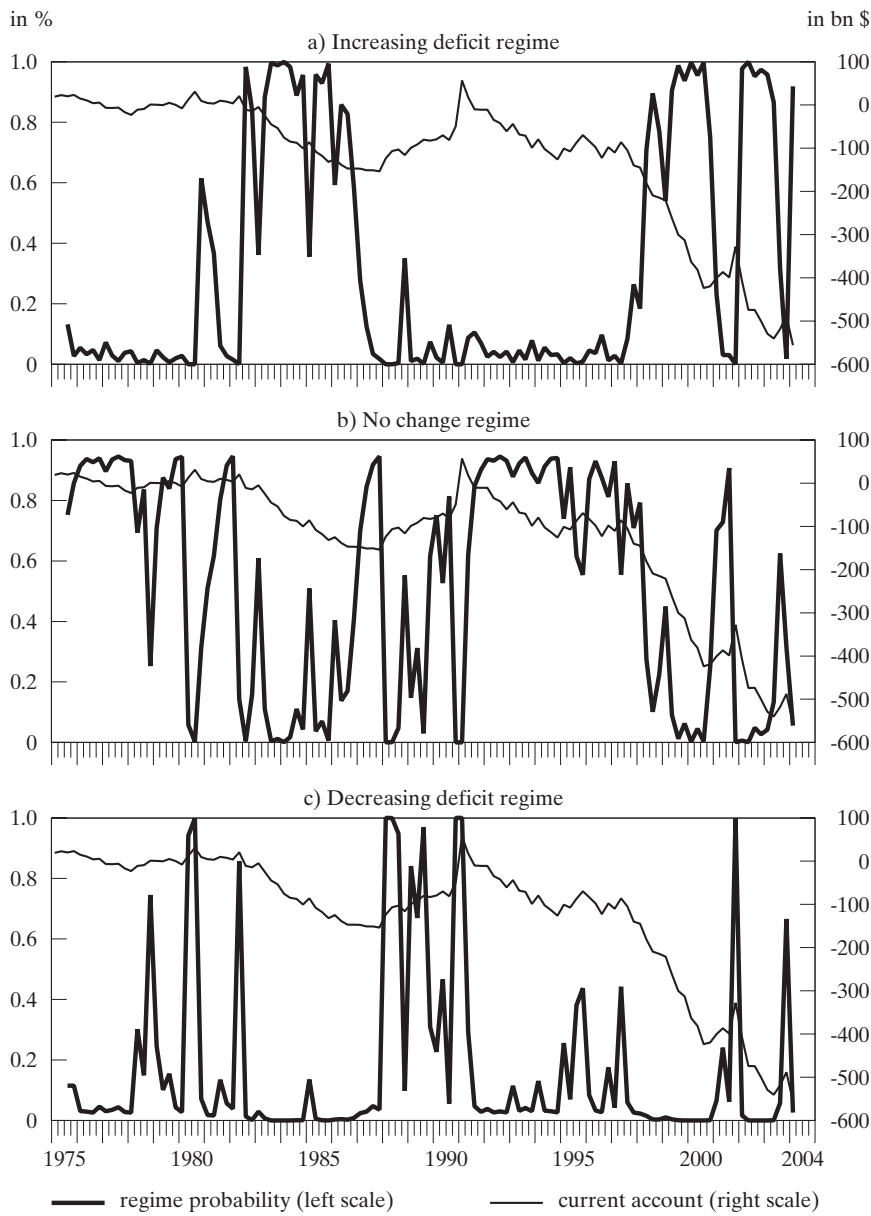
As figure 3 indicates, the estimated regime switching model identifies three phases of a strong increase in the current account deficit. Only the increase of the deficit beginning in 1991 is not well captured by the model as it ascribes this phase almost entirely to the no-change regime. On the other hand it identifies the larger decrease of the deficit from 1987 to 1991 as a succession of phases with decreasing and no changing deficits. Additionally a few smaller episodes of decreasing or no changing deficits are identified.

4. Characterizing the current account regimes

4.1 Estimation strategy

In this section, we relate these three previously identified current account regimes to economic activity. In doing so, we try to find variables which help to predict changes in current account regimes. We therefore assign the values –1, 0 and 1 to the increasing deficit regime, the no-change regime and the decreas-

Figure 3
Probabilities of different regimes
1975:1 to 2004:1



Authors' computations.

ing deficit regime, respectively, and estimate ordered Logit models inspired by the three economic approaches outlined in section 2.[5]

To explain this approach in more detail, let y_i^* be the unobservable current account regime that depends linearly on the explanatory variables x_i' (Maddala 1987)

$$y_i^* = \beta x_i' + u_i \text{ for } i = 1, \ldots, n.$$

The "observable" regime variable y_1 with the three possible outcomes –1, 0 and 1 is related to y_i^* as follows:

$$y_i = \begin{cases} -1 & if \quad y_i^* \le \gamma_1 \\ 0 & if \quad \gamma_1 < y_i^* \le \gamma_2 \\ 1 & if \quad \gamma_2 < y_i^* \end{cases}.$$

The γ_i represent limit values which are estimated along with β. The probabilities of observing each value y_i can be depicted using the cumulative logistic function of u

$$\Pr(y_i = 1 | x_i, \beta, \gamma) = \frac{1}{1 + e^{-\gamma_1 + \sum x_i' \beta}}$$

$$\Pr(y_i = 0 | x_i, \beta, \gamma) = \frac{1}{1 + e^{-\gamma_2 + \sum x_i' \beta}} - \frac{1}{1 + e^{-\gamma_1 + \sum x_i' \beta}}$$

$$\Pr(y_i = 1 | x_i, \beta, \gamma) = 1 - \frac{1}{1 + e^{-\gamma_2 + \sum x_i' \beta}}.$$

The model is estimated by Maximum-likelihood. The significance of the threshold values γ_i will indicate the appropriateness of the different regimes. To compare the estimated coefficients, the variables have been standardized to zero mean and unit variance prior to the inclusion in the Logit model (Osborn et al. 2003: 10).

4.2 Estimation and Results

The estimation results for the different Logit models are presented in table 3.[6] The interpretation of the results is different from other regression models. A positive sign of a coefficient indicates that this variable implies a greater probability of being in a higher current account regime whereas a negative sign in-

[5] This estimation strategy has been previously used in the business cycle literature to characterise business cycle phases (Estrella, Mishkin 1998; Osborne et al. 2003), with the dependent variable typically representing a binary outcome.

[6] For a detailed description of the data see the appendix.

dicates a higher probability of being in a lower current account regime. As it is not possible to interpret the coefficients as marginal effects these are calculated separately.

The boundary conditions (limit 1 and 2) in all models are strongly significant, indicating evidence of ordering in the data. In a first step we use four different sets of variables. Each of them is related to one of the three economic approaches of the current account to check whether one of these approaches is particularly useful to predict changes in current account regimes. To start with the international trade approach the growth rates of the U.S. and other industrial countries exert no significant effects on the separation of current account regimes. This conflicts with the above mentioned finding of Freund (2000) that reductions of current account deficits are accompanied by economic slowdowns. The inflation rate of the U.S. contributes significantly to the separation of the current account regime but with an unexpected sign. Contrary our findings suggest that a higher inflation rate increases the probability of being in a higher current account regime.[7] This result however is in line with the finding of Kandil/Greene (2002: 19). They suppose that it takes time to substitute domestic and foreign goods so that export earnings are higher relative to import payments in the short run. The G6 inflation rate does not contribute significantly to the separation of regimes. The exchange rate shows the expected negative sign as a depreciation of the dollar reduce imports and promote exports. This leads to a higher probability of being in a lower current account regime.

We investigate the national savings approach in two different regressions. In the first one we find no significant connection between the federal public deficit and the current account deficit. Secondly we observe the link between saving and investment on the one hand and the current account deficit on the other. In this specification we find a significant negative relation between the investment share and the deficit affirming previous studies (Glick, Rogoff 1995). A higher investment demand promotes imports and increases the probability of being in a lower current account regime.

The financial market approach exploits the link between interest rates as well as share prices and the current account as capital imports facilitate the current account deficit. We find no significant relation between U.S. and foreign interest rates and the current account. However the ratio of U.S. and foreign share prices exhibits a strong significant impact on the current account deficit. All in all this finding is consistent with Mercereau (2003) and Kandil/Greene (2002) who utilize short term interest rates and a variable for the U.S. stock market.

7 Subsequent, "higher" and "lower" correspond to the natural ordering of the current account regimes, i.e. an unchanged current account regime ($y_i = 0$) is higher than an increasing current account regime ($y_i = -1$) etc.

Table 3

Estimation results of current account models for three regimes

	Internatonal trade approach		National saving approach				Financial market approach		Combination	
	Coeff	Marg eff (Reg=1)	Coeff	Marg eff (Reg=1)	Coeff	Marg eff (Reg=1)	Coeff	Marg eff (Reg=1)	Coeff	Marg eff (Reg=1)
US growth	–0.059 (0.282)	–0.002 (0.011)							–0.081 (0.430)	–0.001 (0.006)
G6 growth	–0.380 (0.272)	–0.014 (0.011)							–0.874** (0.378)	–0.013 (0.008)
US inflation	2.322*** (0.871)	0.087** (0.042)							2.624** (1.345)	0.039 (0.027)
G6 inflation	0.353 (0.522)	0.013 (0.020)							0.649 (0.941)	0.010 (0.015)
Exchange rate	–1.870*** (0.397)	-0.070*** (0.026)					–1.800*** (0.431)	-0.067*** (0.025)	–0.526 (0.577)	–0.008 (0.009)
Federal deficit			–0.091 (0.219)	-0.011 (0.023)						
US saving					0.353* (0.216)	0.034 (0.022)			0.190 (1.194)	0.003 (0.018)
US Invest.					–0.775*** (0.214)	-0.075*** (0.024)			–2.153*** (0.765)	-0.032 (0.020)
US interest rate							1.183 (0.755)	0.044 (0.031)	3.984** (1.602)	0.059 (0.038)
G6 interest rate							–0.408 (0.689)	–0.015 (0.026)	–5.801*** (1.916)	–0.086 (0.053)
Share prices							–0.801*** (0.331)	-0.030** (0.015)	–2.011 (0.585)	–0.030** (0.017)
Limit 1	–1.413***		–0.599***		–0.672***		–1.034***		–1.886***	
Limit 2	2.547***		1.859***		2.1***		3.110***		3.494***	
No of obs	88		96		96		92		88	
Pseudo R2	0.33		0.001		0.08		0.31		0.49	

Authors' computations. Standard errors in parentheses. – *Significant at the 10 % level. – **Significant at the 5 % level. – ***Significant at the 1 % level.

To make sure that our results are not affected by preselection, we combine variables from the different approaches. In this regression the relation between the exchange rate and the current account regimes becomes insignificant. The G6 growth and both interest rate variables become significant but with an unexpected sign. The positive impact of the U.S. inflation rate seems also to be robust albeit puzzling. U.S. investment and the share price ration are again significant in this equation.

5. Conclusions

The substantial current account deficit of the United States implies the possibility of a pronounced reduction of the deficit combined with a strong depreciation of the dollar and a slowdown of economic activity. To get an impression whether an abrupt current account adjustment is likely to occur we character-

ize in a first step the dynamics of current account movements by a Markov-Switching model. Our findings suggest that these movements are most suitably characterized by three current account regimes. Additionally movements of the current account deficit are asymmetric. Whereas an increasing deficit regime is rather seldom but long lasting a decreasing deficit regime is more frequent but short. A third regime is characterized by a slightly increasing deficit and medium duration. Moreover the transition probabilities do not indicate a sudden reversal of the current account deficit as the regime sequence proceeds from the rising deficit via the slightly increasing deficit to the diminishing deficit. The analysis of this sample does not suggest that a pronounced reduction of the deficit is likely to occur.

Subsequently we aimed at finding indicators for changes in the deficit regimes. Therefore we applied three different theoretical approaches in an estimation of ordered Logit models for the current account regimes. Our findings suggest that none of the theoretical approaches can solely explain the movements of the current account satisfactorily. In particular we find no significant relation between economic activity as measured by GDP growth and deficit regimes. While we also find no support for the twin deficit hypothesis, a combination of U.S. inflation, U.S. investment and share prices seems to be able to predict regime shifts of the current account.

References

Brook, A.-M., F. Sédillot and P. Ollivaud (2004), Channels for narrowing the U.S. Current Account Deficit and implications for other economies. OECD Economic Department Working Paper 390. OECD, Paris.

Chinn, M. and E.S. Prasad (2003), Medium-term Determinants of Current Accounts in Industrial and Developing Countries: An Empirical Exploration. *Journal of International Economics* 59: 47–76.

Cooper, R.N. (2001), Is the U.S. Current Account Deficit Sustainable? Will it be Sustained? *Brookings Papers on Economic Activity* 2001: 217–226.

Davies, R.B. (1987), Hypothesis Testing when a Nuisance Parameter is Present only under the Alternative. *Biometrika* 74: 33–43.

Edwards, S. (2002), Does the Current Account matter? In S. Edwards and J.A. Frankel (eds.). *Preventing currency crises in Emerging Markets*. Chicago et al.: University of Chicago Press.

Edwards, S. (2004), Thirty years of Current Account Imbalances, Current Account Reversals and Sudden Stops. NBER Working Paper 10276. NBER, Cambridge, MA.

Estrella, A. and F.S. Mishkin (1998), Predicting U.S. Recessions: Financial Variables and Leading Indicators. *Review of Economics and Statistics* 80: 45–61.

Feldstein, M. (1992), The budget and the trade deficits aren't really twins. NBER Working Paper 3966. NBER, Cambridge, MA.

Filardo, A.J. (1994), Business Cycle Phases and Their Transitional Dynamics. *Journal of Business and Economic Statistics* 12: 299–308.

Fischer, S. (2003), Financial crises and reform of the International Financial System. *Review of World Economics* 1: 1–37.

Frankel, J.A. and A. Rose (1996), Currency crashes in Emerging Markets: An Empirical Teatment. *Journal of International Economics* 3: 351–366.

Freund, C.L. (2000), Current Account Adjustment in Industrialized Countries. Board of the Federal Reserve System International Finance Discussion Papers 692. FRS, Washington, DC.

Genberg, H. and A.K. Swoboda (1992), Saving, Investment and the Current Account. *Scandinavian Journal of Economics* 94: 347–366.

Glick, R. and K. Rogoff (1995), Global versus country-specific productivity shocks and the current account. *Journal of Monetary Economics* 35: 159–192.

Hamilton, J. (1989), A New Approach to the Economic Analysis of Nonstationary Time Series and the Business Cycle. *Econometrica* 57: 357–384.

Hamilton, J. and B. Raj (2002), New directions in business cycle research and financial analysis. *Empirical Economics* 27: 149–162.

Kandil, M. and J. Greene (2002), The Impact of Cyclical Factors on the U.S. Balance of Payments. IMF Working Paper 02/45. IMF, Washington, DC.

Krolzig, H.-M. (1997), *Markov-switching Vector Auroregressions*. Modelling, Statisical Inference and Application to Business Cycle Analysis. Berlin: Springer.

Krolzig, H.-M. (1998), Econometric Modelling of Markov-Switching Vector Autoregressions using MSVAR for Ox. University of Oxford.

Maddala, G.S. (1987), *Limited-dependent and Qualitative Variables in Econometrics*. Cambridge: Cambridge University Press.

Mann, C.L. (2002), Perspectives on the U.S. Current Account Deficit and Sustainability. *Journal of Economic Perspectives* 16: 131–152.

McKinnon, R.I. (2001), The International Dollar Standard and the Sustainability of the U.S. Current Account Deficit. *Brookings Papers on Economic Activity* 2001: 227–239.

Mercereau, B. (2003), The Role of Stock Markets in Current Account Dynamics: Evidence from the United States. IMF Working Paper 03/108. IMF, Washington, DC.

Obstfeld, M. and K. Rogoff (2000), Perspectives on OECD Economic Integration: Implications for U.S. Current Account Adjustment. Centre for International and Development Economics Research Working Paper. University of Berkley, CA.

Obstfeld, M. and K. Rogoff (2004), The unsustainable U.S. Current Account Position revisited. NBER Working Paper 10869. NBER, Cambridge, MA.

Olivei, G. P. (2000), The role of savings and investment in balancing the current account: Some empirical evidence from the United States. *New England Economic Review* 2000 (July/Aug.): 3–14.

Osborn, D.R., M. Sensier and D. van Dijk (2003), Predicting Growth Cycle Regimes for European Countries. Centre for Growth and Business Cycle Research Discussion Paper 39. University of Manchester.

Poole, W. (2004), A Perspective on U.S. International Capital Flows. *Federal Reserve Bank of St. Louis Review* 86: 1–7.

Rahman, M. and B. Mishra (1992), Cointegration of U.S. Budget and Current Account Deficits: Twins or Strangers? *Journal of Economics and Finance* 16: 119–127.

Sachs, J. D. (1981), The Current Account and Macroeconomic Adjustment in the 1970s. *Brookings Papers on Economic Activity* 1981: 201–268.

Data Description

CA	Current Account Balance, NIPA's, seasonally adjusted annual rate; Bureau of Economic Analysis
GDP^{US}	Growth rate of real Gross Domestic Product, seasonally adjusted annual rate, billions of chained 2000 dollars; Bureau of Economic Analysis
GDP^{G6}	Growth rate of summed Quarterly real GDP of Canada, France, Germany, Great Britain, Italy and Japan in constant prices in US-Dollar; OECD
p^{US}	Growth rate of consumer prices; Bureau of Economic Analysis
p^{G6}	Mean of inflation rates of Canada, France, Germany, Great Britain, Italy, Japan weighted by shares of GDP; IMF: IFS
ex^{real}	Trade weighted Exchange Rate Index: major currencies, index March 1973 = 100; Board of Governors of the Federal Reserve System
S	Gross Private Saving, seasonally adjusted annual rate, billions of dollars; Bureau of Economic Analysis
I	Gross Private Domestic Investment, seasonally adjusted annual rate, billions of dollars; Bureau of Economic Analysis
Def	Federal Government Deficit: As a percentage of GDP, not seasonally adjusted, billions of dollars; U.S. Department of the Treasury
$shares$	Ratio of the Net Total Return Index USA (MSCI) to the Net Total Return Index World; Morgan Stanley
i^{US}	Ten Year Treasury Constant Maturity Rate; Board of Governors of the federal reserve system
i^{G6}	Mean of interest rates of Canada, France, Germany, Great Britain, Italy, Japan weighted by shares of GDP; IMF: IFS