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The Demise of the Swiss Interest Rate Puzzle

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The Demise of the Swiss Interest Rate Puzzle

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The Demise of the Swiss Interest Rate Puzzle

Peter Kugler and Beatrice Weder*

This version: January 31 2009

Abstract

In this paper we analyzed the violations of UIP for the Swiss Franc against the Dollar, the Euro, the Yen, the Pound and the Canadian Dollar using recent data up to fall 2008. This exercise provides the following main results : first the Swiss interest rate puzzle disappeared, i.e. mean returns on Swiss Franc assets are no longer systematically and significantly lower (as in the 1980 – 1998 sample) when compared jointly with other major currencies in the 1999 to 2008 period. Second and in contrast to earlier evidence we failed to find evidence that geopolitical crises lead to an appreciation of the Swiss Franc in the last ten years. Third even the short run validity of UIP cannot be rejected for the Swiss Franc against the five currencies for the 1999 – 2008 sample. Unfortunately our attempt to locate the time of change and the currencies involved by the application of tests for structural breaks with unknown break point did not lead to clear cut conclusion for the Euro and the Dollar, the two most important foreign currencies from a Swiss perspective.

JEL Classification: E43, E44, G15
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1. Introduction

Almost exactly ten years ago, we started researching what we called the Swiss Interest Rate Puzzle with the intention of eventually solving it. This attempt led, among others, to three papers (Kugler and Weder, 2002, 2004, 2005) in which we analyzed the long and short run interest rate parity of 10 mayor OECD currencies using data before 1999 and found that there is a long run failure of the uncovered interest rate parity condition for the Swiss Franc. After correcting for exchange rate changes, mean returns on Swiss assets were significantly lower than in other currencies, an anomaly not found in any other major currency. The mean return differential over the long run was stable over the period 1980-98 and transitory structural breaks were only found in times of currency turmoil. We offered a possible explanation for the return anomaly, namely that it may be due to an insurance premium against very rare events, such as a major war. We found support for this hypothesis from two empirical findings: first, we showed that the differential between exchange rate corrected foreign currency interest rates and the Swiss franc interest rate - which is normally positive - is highly negatively affected in the short run by unexpected events increasing the world-wide political uncertainty. Second the examination of historical data of interest rates during the pre-war and inter-war period showed that the abnormal low level of Swiss interest rates arises after the First World War in a period of very high monetary and political uncertainty.

The last ten years were characterized by which two potentially very important monetary and political changes: first, the replacement of 15 sometimes rather unstable and high inflation currencies by the relatively stable common new currency, the Euro. In such a world a stable currency like the Swiss Franc may become less attractive. Second, the collapse of the Soviet block in the early nineties decreased the probability of a large scale war as the two world wars in the 20th century. This might also affect the safe haven properties of the Swiss Franc, making it less attractive. Last but not least, the financial turmoil of last weeks and months have provided a new event study of stress and a sharp appreciation of the Swiss Franc. Overall, it seems a good time to revisit the original puzzle, to establish whether the stylized facts still hold and re-evaluate our solutions.

The paper is organized as follows. Section 2 revisits the stylized facts up to 1998 an gives a brief account of the explanations offered for the Swiss Interest Rate Puzzle. Section 3 discusses the stylized facts over roughly the last ten years und looks for structural breaks and section 4 concludes.

2. The Puzzle – Stylized Facts and Possible Explanations

In a series of three previous papers (Kugler and Weder, 2002, 2004, 2005) we established the following stylized facts for the period 1980-1998:

(i) The long run violation of uncovered interest rate parity was unique to the Swiss Franc, which was not found in any other major currency.
(ii) The puzzle applied equally to all currencies under considerations.
(iii) The return differentials were stable and did not diminish over time since the end of World War I.
(iv) The puzzle of low real interest rates for the Swiss Franc money market instruments and bonds was mainly due to a long run departure from uncovered interest rate parity. Deviations from relative PPP play no important role.
(v) The Swiss Franc was not special with respect to the well known short run violations of uncovered interest rate parity (forward premium puzzle), but
(vi) The return anomaly was present for fixed income assets (money market instruments and bonds) but and not for equity.

What are the explanations offered for the puzzling stylized facts which are called the Swiss Interest Rate Puzzle?

Banking secrecy and capital inflows into Switzerland

Since there is a wide spread suspicion that the nature of the Swiss banking secrecy may be responsible for the interest rate island it is worth restating that this was one of the blind alleys. The popular argument runs like this: that banking secrecy attracts huge funds that are evading taxes into Switzerland and this drives down Swiss interest rates.

There are several reasons to discard this as a solution to the puzzle. First of all this proposition suggests that the return rate differential is that it should only apply to assets which are

held at Swiss banks located in Switzerland and subject to Swiss jurisdiction. However, the interest rate puzzle was found in Euro market or currency deposits, i.e. short term deposits in Swiss Francs, which are held outside Switzerland.

Second, the foreign demand for Swiss assets is quantitatively small since non residents hold their deposits with Swiss banks mostly in other currencies. Furthermore, non residents hold Swiss Franc deposits mostly in equity, where we did not find a return differential. We found little evidence for a role of banking secrecy since non residents have a very limited preference for fixed income instruments issued by foreign debtors, which should be the prime instruments for tax evasion since they are exempt of withholding taxes that apply to resident issues. In Kugler and Weder (2004) we conducted a dynamic factor analysis to examine whether the portfolio shift of residents and non residents can explain the returns on Swiss assets and find that foreign demand had almost no impact on Swiss Franc asset prices. The data on portfolio holdings were taken from a survey conducted on a monthly basis by the Swiss National Bank (SNB) and which are available since late 1998. They include the portfolio holdings deposited with 342 banks located in Switzerland and Liechtenstein and cover about 95% of the total value deposited. Nevertheless, there are some limitations of this data set. In particular, there is the problem of data coverage. For example, if a US investor holds a Swiss Franc security and deposits it with a non-Swiss bank, this would not be included in our dataset.[1]

Note that we are not claiming that banking secrecy is irrelevant for the income of the Swiss wealth management industry. But it cannot serve as an explanation for the interest rate differentials.

Diversification and Portfolio optimization

[1] To assess the amount of leakage, take the example of Novartis AG. Based on the share register in 2005, 53% of the shares registered by name are deposited within Switzerland, and 36% are held by approximately 850 holders in the US. Roughly 14% of the shares registered are held by retail or individual investors, while 86% are held by institutional investors.

In Kugler and Weder (2004) we showed that some Swiss franc assets (money market and bonds but not equities) have a very low or even negative correlation with the returns of other risky assets and they can therefore serve to diversify. Indeed, using the portfolio shares reported in the SNB survey for Swiss residents and reversed portfolio optimization (Black and Litterman 1992) to back out the implied expected returns we found that the estimated pattern of these returns conformed very well to the observed pattern and the Swiss interest rate puzzle. From this research we concluded that the interest rate differential could be explained by a diversification motive. The problem is that this does not amount to a full explanation. The finding alone does not tell us which are the "deep" factors driving this pattern of correlations and equilibrium returns.

Insurance against catastrophic risk and Peso Problem

Our preferred candidate for a "deep" factor was an insurance premium for catastrophic events (Kugler and Weder (2005)). Investors may accept somewhat lower returns in normal times if they expect that the Swiss Franc would appreciate in the event of a large scale disaster. Since such events are rare and have not been observed in the past 20 years it is difficult to test the hypothesis for this period. Therefore we are confronted with a peso problem when trying to estimate the hypothesis based on data from tranquil times. Nevertheless we found support for this hypothesis from two empirical findings: first, we showed that the return differential is negatively affected in the short run by large unexpected geo-political events, such as the fall of the Berlin Wall, or the sudden death of Soviet leaders. Second we presented historical evidence on interest rates differentials during the pre-war and inter-war period. These show that the abnormally low level of Swiss returns arose after the First World War only.

Our evidence on the Swiss return puzzle is also consistent with the view of Barro (2005), who shows that allowing for low-probability disasters explains a number of puzzles related to asset returns and consumption. Other "friendly" literature includes Jorion and Goetzmann (1999), who offer a similar explanation for the equity premium puzzle. They showed that the equity price puzzle also disappears for countries that suffered catastrophic events, in particular the interruption of the stock exchange during the wars.

Over the last years we continued our search for evidence on the insurance premium. Not discouraged by the peso problem, we set out to identify geopolitical events, which would not

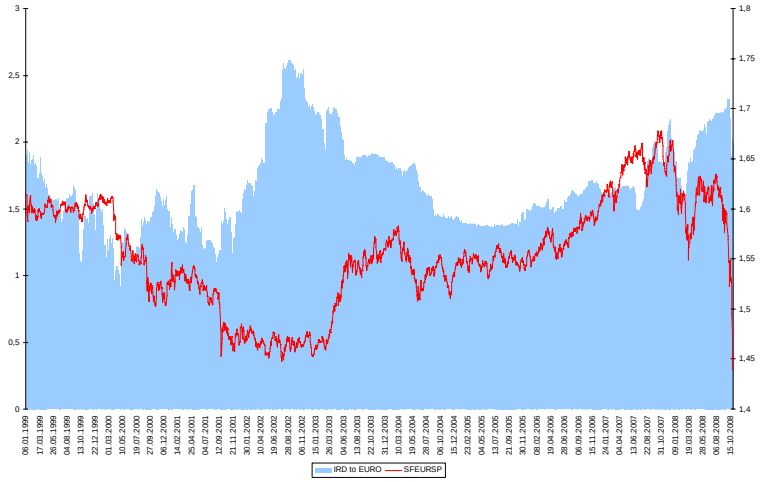
qualify as catastrophic but might be large enough to bring about some safe haven effects – i.e. an appreciation of the exchange rate. We report our results for the record, since the overall conclusion was that we failed to strike gold. Here is what we tried. First we looked for geopolitical events which were "large" and unexpected. A large event would not only make all front pages of newspapers but would also be engraved in people's memories. September 11 is an example of a large event. It also qualifies as completely unexpected, which is not the case of other large events like the Iraq War. Our approach therefore was to use the dates of terrorist attacks and test whether the Swiss Franc responded with a larger than normal appreciation. It did not. Next we turned around and tried a "reverse event study". We defined large currency appreciations and then looked whether these patterns could be matched to significant geopolitical events. We took our cue from the currency crisis literature and defined "appreciation crisis" in several ways, on weekly, daily and monthly basis. Again, we were unable to uncover a pattern.

Overall, we do not discard the peso problem as a solution to the puzzle. After all, it is the nature of peso problems that they cannot be found in the data. But we do report failure in coming up with further evidence in its favor.

Carry trade and the puzzle

Our expectation was that the interest rate puzzle would have increased over the past decade for several reasons. First the nominal interest rate differential between the Euro and the Swiss Franc was quite stable at around 1,5 percent. Second there was a prolonged period in which the Swiss Franc depreciated vis-à-vis the Euro. The depreciation lasted for more than 2 years and lead many observers to believe that the secular trend appreciation of the Swiss Franc vis-à-vis other European currencies had been broken. (Figure 1)

Figure 1: Nominal Interest Rate Differential and Exchange Rate Euro /Swiss Franc



Two salient features of the last years were a historical low of financial market volatility and broadly trending exchange rates. In this environment investors with short-term horizons could earn attractive risk-adjusted returns on foreign exchange markets deploying carry trade strategies and using the Swiss Franc as a funding currency. And even investors with longer time horizons such as Eastern European households increasingly engaged in carry trades by financing their mortgages in Swiss Francs.

The increasing use of the Swiss Franc as a funding currency for carry trades is consistent with the large growth of FX turnover as reported by the BIS. Figure 2 shows that the daily turnover of US Dollar / Swiss Franc rose from 57 billion in 2001 to 143 billion in 2007. The turnover Euro /Swiss Franc increased from 12 to 54 billion per day over the same period. In fact, the growth rate in Euro/Swiss Franc turnover is higher than in any other mayor currency pair (see figure 7).

Figure 2: Daily averages in billions of US dollars

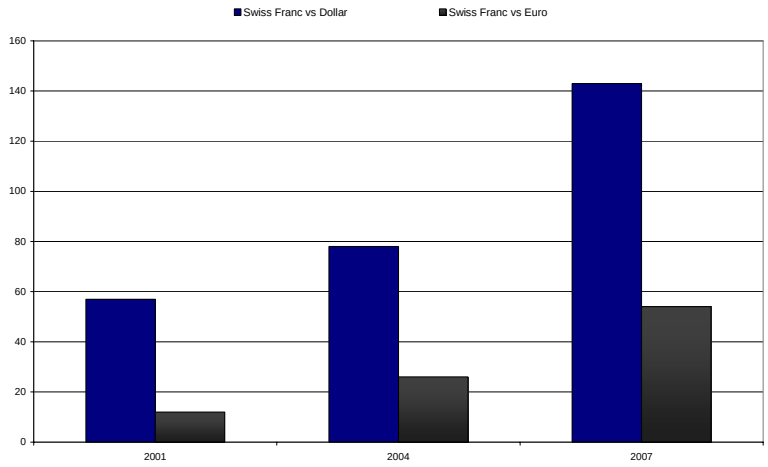
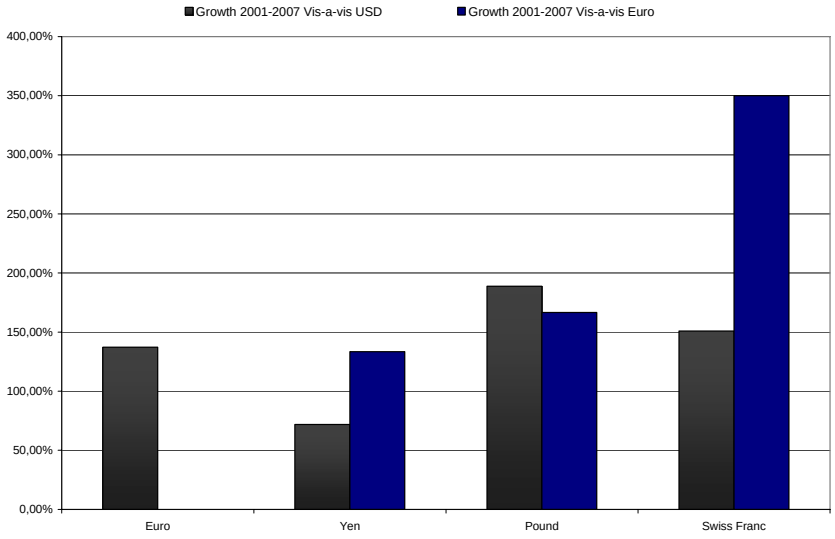


Figure 3: Growth rate of daily turnover on foreign exchange markets



Source: BIS 2007, Table B. 5

The evidence on the surge of carry trades in Swiss Francs and the raw interest rate differentials with the Euro reinforced our expectation that the puzzle would have increased over the last decade. We now proceed to re-examining the main stylized facts for the period 1999-20008.

3. Stylized facts 1999-2008 and structural breaks

In this section we consider the stylized fact with respect to one-month (euro currency market) investment in Swiss Franc (SFR), Canadian Dollar (CAD), EURO (DM before 1999), Yen (JYN), British Pound (UKP) and US Dollar (USD). We focus on the return differential after exchange rate adjustment

$$i^*_{i,t-1} + \Delta s_{i,t} - i_{t-1},$$

where i is the home interest rate i* is he foreign currency interest rate and s is the log exchange rate (home currency per unit of foreign currency).

In Tables 1 and 2 we report the mean of the return differentials of all the combinations of the six currencies for the periods 1999-2008 and 1980-1998, respectively. The home currency is indicated in the column, i. e. the last column gives us the return differential of the foreign currencies with respect to the Swiss franc. The last columns of table 1 and 2 reveal an interesting change between these two periods. Before 1999 we have for all five currencies considered a higher mean return than for the Swiss Franc. This is no longer true since 1999: Swiss Franc investment resulted in a higher mean return than those in Yen and US Dollar! The case of the Yen with a change in mean from around 3% to – 1.6% is in particular striking.

Table 1: Rate of Return Differentials (after exchange rate adjustment), Percent p.a.

Mean 1999:02-2008:10 and Standard Errors in Parenthesis

$$i^*_{i,t-1} + \Delta s_{i,t} - i_{t-1}$$

	EURO	JYN	UKP	USD	SFR
CAD	1.54	4.00	1.17	2.30	2.22
	(3.13)	(4.19)	(2.98)	(2.77)	(3.61)
EURO		2.46	-0.33	0.75	0.70
		(3.70)	(2.09)	(3.13)	(1.31)
JYN			-2.82	-1.75	-1.63
			(3.69)	(3.04)	(3.37)
UKP				1.00	1.11
				(2.67)	(2.40)
USD					0.05
					(3.15)

Table 2: Rate of Return Differentials (after exchange rate adjustment), Percent p.a.

Mean 1980:01-1998:12 and Standard Errors in Parenthesis

$$i^*_{i,t-1} + \Delta s_{i,t} - i_{t-1}$$

	DEM	JYN	UKP	USD	SFR
CAD	1.13	-1.16	-1.20	-0.36	1.97
	(2.85)	(3.01)	(2.64)	(1.08)	(3.02)
DEM		-2.29	-2.29	-1.52	0.84
		(2.51)	(2.12)	(2.75)	(0.92)
JYN			0.06	0.89	3.13
			(2.86)	(2.94)	(2.50)
UKP				0.84	3.19
				(2.67)	(2.31)
USD					2.36
					(2.96)

The standard errors a relatively high because of the very high volatility of exchange rate corrected returns in both periods. Thus no mean is individually statistically significantly different from zero. In our 2000 paper we estimated a system of AR(1) equations jointly for the return differential for the Swiss Franc against 10 currencies and could clearly reject the joint hypothesis of

zero intercepts and a zero AR(1) coefficient, respectively. Table 3 reports the estimation result for our five currencies and the period 1999-2008.

Table 3: Results from AR(1) Models for Nominal Return Differentials, Swiss Franc vis-à-vis 5 Currencies, Monthly Data 1999:02-2008:10,

$$i^*_{i,t-1} + \Delta s_{i,t} - i_{t-1} = \gamma_i + \delta_i (i^*_{i,t-2} + \Delta s_{i,t-1} - i_{t-2}) + e_{i,t}$$

SUR-Estimates, Standard Errors in Parentheses

Currency	γ	δ
CAD	1.95	0.069
	(3.61)	(0.068)
EURO	0.72	-0.015
	(1.31)	(0.085)
JYN	-1.74	-0.046
	(3.36)	(0.079)
UKP	1.17	-0.033
	(2.39)	(0.073)
USD	0.06	0.084
	(3.13)	(0.065)

The Wald Test that all intercept terms and AR(1)-coefficients are jointly zero cannot be rejected at all usual significance levels (chi-square value %. 4.75, marginal significance level of 0.9070). Therefore the puzzle of the return differential is no longer present over this period. When we estimate this system for the period 1980-1998 we do find the original puzzle, we get a chi-square value of 41.02 for this hypothesis with a marginal significance level of 0.00003. Moreover, we note that even the short run validity of UIP cannot be rejected as the return differentials appear to be mean zero white noise processes.

These results clearly point to a break in the series. In the sequel we want to check whether we can locate the break in time. To this end we apply the Bai and Perron structural break methodology to our full data set.

Table 4 presents Bai and Perron´s (1998) sequential test of the structural stability of these equations estimated for the nominal return differentials over the full sample 1980-2008. We

assumed a maximum number of breaks equal to 5 and a minimum distance between two breaks equal to 12. However the results are robust, with respect to reasonable variations of these parameters. Table 4 indicates only two breaks in the intercept, namely for the Yen in 1989:04 (only for the reduced 1980 to 1990 sample) and the US Dollar in 1985:02, respectively. If we consider breaks in intercept and slope jointly we find only one for the US Dollar in 1987:12. Therefore, these tests provide rather weak evidence for structural breaks. Furthermore, if any, they are located in the eighties and not nineties and do not concern European currencies as we would expect from the introduction of the Euro in 1999.

Table 4: Results of the Sequential Bai-Perron Test for Multiple Structural Changes AR(1) Models for Nominal Return Differentials, Swiss Franc vis-à-vis 5 Currencies (max. breaks = 5, min. distance = 12 month), Monthly Data 1980:01-2008:10

$$i^*_{i,t-1} + \Delta s_{i,t} - i_{t-1} = \gamma_i + \delta_i (i^*_{i,t-2} + \Delta s_{i,t-1} - i_{t-2}) + e_{i,t}$$

Currency	*Break in intercept*		*Break in intercept and slope*	
	Break point	F-statistic	Break Point	F-statistic
CAD	85:02	6.44	85:02	6.40
	86:02	6.42	86:08	9.03
	87:12	2.46	82:12	3.50
DEM /	81:11	2.61	81:11	3.07
EURO	86:02	0.00	83:03	0.70
	82:11	0.31	82:11	0.00
JYN	93:07	1.79	89:03	3.73
	92:07	6.45	87:11	3.86
	90:04	0.00	90:04	2.93
	89:04	13.36**	93:07	1.96
	82:03	1.80	92:07	3.24
UKP	96:07	6.95	96:07	5.52
	92:04	0.16	92:04	0.00
	87:01	2.77	86:09	3.28
USD	85:02	9.69**	85:02	8.08
	87:12	7.41	87:04	12.35*
	89:05	4.27	95:04	2.83

*, ** and *** indicates significance at the 10, 5 and 1% level, respectively

In order to get more insights we estimated the AR(1) models separately over the period 1980-2008 and applied the cusum test to the recursive residuals of these estimated equations. The results obtained are given in the Figures 4 to 8. These tests point to instability of the parameter for the Yen, the Pound and the US Dollar. However, the model for the Canadian Dollar and the DM/Euro series shows no sign of break. These results confirm more or less those of the Bai-Perron approach in the sense that no break is found for the DM/Euro case.

Figure 4: CUSUM Test for the recursive residuals of an AR(1) model of the return differential between Canadian Dollar and Swiss Franc, 1980:01-2008:10

$$i^{*}_{i,t-1} + \Delta s_{i,t} - i_{t-1} = 2.150 + 0.0333(i^{*}_{i,t-2} + \Delta s_{i,t-1} - i_{t-2})$$
$$(2.345)\ \ (0.055)$$

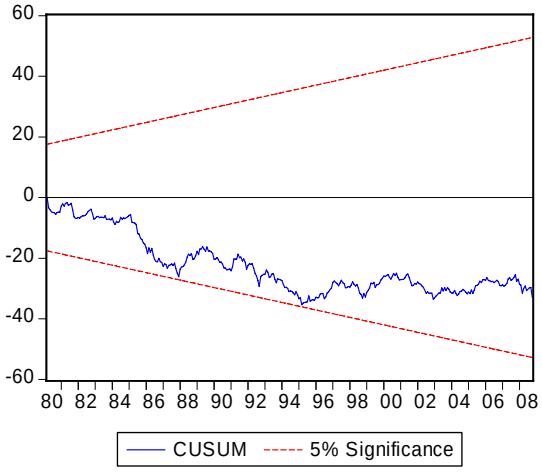


Figure 5: CUSUM Test for the recursive residuals of an AR(1) model of the return differential between Euro/DM and Swiss Franc, 1980:01-2008:10

$$i^*_{i,t-1} + \Delta s_{i,t} - i_{t-1} = 0.5520 + 0.2542(i^*_{i,t-2} + \Delta s_{i,t-1} - i_{t-2})$$
$$(0.7314)\ \ (0.0558)$$

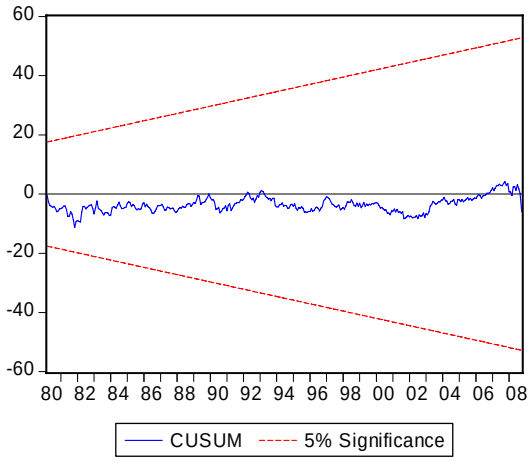


Figure 6: CUSUM Test for the recursive residuals of an AR(1) model of the return differential between Yen and Swiss Franc, 1980:01-2008:10

$$i^*_{i,t-1} + \Delta s_{i,t} - i_{t-1} = 1.5043 + 0.0827(i^*_{i,t-2} + \Delta s_{i,t-1} - i_{t-2})$$
$$(2.0035)\ \ (0.0549)$$

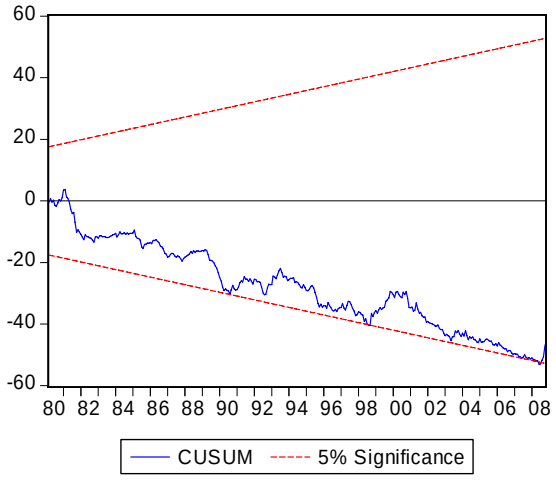


Figure 7: CUSUM Test for the recursive residuals of an AR(1) model of the return differential between UK Pound and Swiss Franc, 1980:01-2008:10

$$i^*_{i,t-1} + \Delta s_{i,t} - i_{t-1} = 2.218 + 0.1143(i^*_{i,t-2} + \Delta s_{i,t-1} - i_{t-2})$$
$$(1.7204)\ \ (0.0540)$$

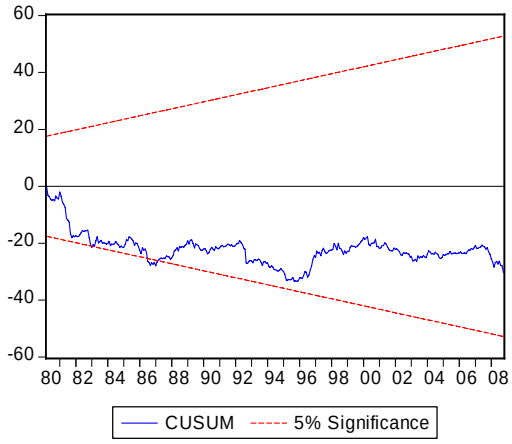
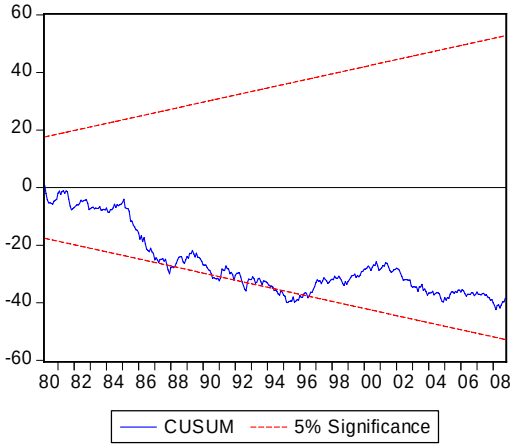


Figure 8: CUSUM Test for the recursive residuals of an AR(1) model of the return differential between US Dollar and Swiss Franc, 1980:01-2008:10

$$i^*_{i,t-1} + \Delta s_{i,t} - i_{t-1} = 1.523 + 0.1098(i^*_{i,t-2} + \Delta s_{i,t-1} - i_{t-2})$$
$$(2.218)\ \ (0.0537)$$



Of course breaks of a linear model could be caused by non-linearities. For instance central banks could behave differently with respect to moderate or extreme changes in the exchange rate. These kinds of non-linearities can be conveniently tested using the Tsay (1989)-test using "arranged" AR(1) models with observations of the current and lagged value of the return differentials sorted in an ascending order. If the model is linear the recursive residual of this arranged AR(1) model is uncorrelated with the regressor under linearity. This hypothesis is tested by regressing the recursive residual on the regressor and the corresponding coefficient is tested to be zero by an F-statistic. Table 5 reports the Tsay-statistic for our data. We detect significant non-linearities for the Yen and the Pound. Thus in these two cases the breaks indicated with the linear models may be the results of asymmetric behaviour of small and large deviations from UIP. However for the two currencies which are central for Switzerland, namely Euro and US Dollar, no indication of non-linearity is found and it is therefore highly unlikely that our findings can be explained by an asymmetric reaction of monetary policy.

Table 5: Tsay test for non-linearity for return differentials against the Swiss Franc 1980:01 – 2008: 10

Currency	F-statistic (p-value)
CAD	0.1893 (0.6638)
EURO	0.0082 (09275)
JPN	4.644 (0.0319)**
UKP	5.2248 (0.0291)**
USD	1.6773 (0.1962)

*, ** and *** indicates significance at the 10, 5 and 1% level, respectively

Our results suggest that the nature of the puzzle has changed even if it is difficult to locate the time of change and the currencies involved. The main feature of the original puzzle has disappeared in the period 1999-2008: The mean return differential of Swiss Franc assets is no longer positive with respect to all mayor currencies. Moreover, jointly the differentials with all major currencies are not significantly different from zero.

Of course our tests suggest that even the short run violation of UIP, the forward premium puzzle disappeared. Therefore, we now turn to check this hypothesis in the usual bivariate regression framework. In our previous work we had found, as many others that the forward premium puzzle was found in Swiss Francs as well as in other currencies. Table 6 and 7 display a remarkable difference between the two periods: In the 1999-2008 sample we detect positive and negative slope coefficient which are not statistically different from zero whereas in the earlier period the coefficients are negative and usually significant. The Wald Test that the intercept term is zero and the coefficient on the interest rate differential is one cannot be rejected at all usual significance levels except for the currency pair Canadian Dollar / Swiss Franc (chi-square value %. 5.44, marginal significance level of 0.066). The Wald-Test that only the coefficient on the interest rate differential is one can be rejected at the 5 % significance level for Canadian Dollar / Swiss Franc, US Dollar / Swiss Franc and at the 10 % significance level for Euro / US Dollar, Canadian Dollar / Euro and the Euro/Pound.

Table 6: Test Results for UIP (Unbiasedness of the Forward Premium),

Monthly Data 1980:01-1998:12, 5 Currencies

$$\Delta s_t = \alpha + \beta(i_{t-1} - i^*_{t-1}) + u_t$$

OLS estimates of α and β, standard errors in parentheses

Currency	DEM		JYN		UKP		USD		SFR	
	α	β	α	β	α	β	A	β	α	β
CAD	-5.41	-1.40	-20.09***	-3.55***	5.83**	-4.53***	-3.24***	-1.65***	-11.63**	-2.23**
	(3.83)	(0.95)	(5.42)	(1.10)	(2.86)	(1.07)	(1.18)	(0.55)	(4.84)	(0.91)
DEM			-6.28**	-1.76	6.09*	-1.10	1.70	-0.97	-2.93**	-1.52**
			(2.94)	(1.10)	(3.68)	(0.76)	(3.04)	(0.83)	(1.33)	(0.66)
JYN					29.87***	-4.48***	11.88***	-2.57***	2.92	-3.49***
					(8.91)	(1.56)	(4.17)	(0.99)	(2.40)	(1.00)
UKP							-7.64**	-2.60***	-13.03**	-1.96**
							(3.40)	(0.93)	(5.11)	(0.84)
USD									-6.02	-1.68**
									(3.77)	(0.77)

Table 7: Test Results for UIP (Unbiasedness of the Forward Premium),

Monthly Data 1999:02-2008:10, 5 Currencies

$$\Delta s_t = \alpha + \beta(i_{t-1} - i^*_{t-1}) + u_t$$

OLS estimates of α and β, standard errors in parentheses

Currency	EURO		JYN		UKP		USD		SFR	
	α	β	A	β	α	β	α	β	α	β
CAD	-1.20	-5.12	-0.32	-0.24	-3.25	4.63	2.21	-2.49	-18.12*	-8.47**
	(3.44)	(3.37)	(14.84)	(4.08)	(5.99)	(4.26)	(2.76)	(2.95)	(9.73)	(4.22)
EURO			6.05	2.18	7.46	-3.68	2.31	-2.69	-0.66	0.20
			(15.04)	(4.79)	(5.16)	(2.83)	(3.20)	(1.98)	(6.73)	(3.88)
JYN					-44.25	9.80*	5.95	-1.22	2.83	-2.32
					(26.94)	(5.67)	(6.82)	(1.76)	(6.19)	(3.88)
UKP							-0.72	-0.38	-17.83	-4.62
							(3.77)	(2.13)	(12.31)	(3.59)
USD									-9.69*	-3.59
									(5.68)	(2.24)

4. Summary and Conclusions

In three earlier papers (Kugler and Weder, 2002, 2004, 2005) we analyzed the long and short run interest rate parity of 10 mayor OECD currencies using data before 1999 and found that after correcting for exchange rate changes, mean returns on Swiss assets were significantly lower than in other currencies, an anomaly not found in any other major currency. We offered a possible explanation for the return anomaly, namely that it may be due to an insurance premium against very rare events, such as a major war. The last ten years were characterized by two potentially very important monetary and political changes: first, the replacement of 15 sometimes rather unstable and high inflation currencies by the relatively stable common new currency, the Euro. Second, the collapse of the Soviet block in the early nineties decreased the probability of a large scale war as the two world wars in the 20th century. In such a world a stable safe haven currency like the Swiss Franc may become less attractive. Therefore we analyzed the violations of UIP for the Swiss Franc

against the Dollar, the Euro, the Yen, the Pound and the Canadian Dollar using an extended sample up to fall 2008. This exercise provides the following main results:

- The puzzle has disappeared in its original form, i.e. mean returns on Swiss Franc assets are no longer systematically and significantly lower when compared jointly with other major currencies in the 1999 to 2008 period.
- We failed to find evidence that geopolitical crises like terrorist attacks lead to an appreciation of the Swiss Franc. Nevertheless we cannot, however, discard the hypothesis of a peso problem since there were no truly catastrophic events in the data.
- Even the short run validity of UIP cannot be rejected for the Swiss Franc against the five currencies mentioned above in the sense that interest rate differentials corrected for exchange rate changes appear to be white noise. This result was confirmed by the usual regression of UIP for all 15 pairs of currencies which provides only very weak evidence against UIP.

Unfortunately our attempt to locate the time of change and the currencies involved by the application of tests for structural breaks with unknown break point did not lead to clear cut conclusion for the Euro and the Dollar, the two most important foreign currencies from a Swiss perspective. The same is true for the application of non-linearity tests for asymmetric reactions to small and large deviations from UIP. Probably we need more than ten years of additional data in order to get more precise results.

References:

Bai, J. and Perron, P. (1998), "Estimating and Testing Linear Models with Multiple Structural Changes", *Econometrica 66*, 47-78.

Black, F. and Litterman R. (1992), Global Portfolio Optimization, *Financial Analysts Journal*, September-October, 28-43.

Barro, Robert (2005), "Rare Events and the Equity Premium" NBER Working Paper No. 11310

Bank of International Settlements (2007), Triennial Central Bank Survey on Foreign exchange and derivatives market activity in 2007, Basel

Hodrick, Robert (2000), "International Financial Management, Englewood Cliffs, Prentice Hall (NY).

Jorion, Philippe and William N. Goetzmann (1999), "Global Stock Markets in the Twentieth Century, *The Journal of Finance* , 953-980.

Kugler, Peter and Beatrice Weder (2002), "The Puzzle of the Swiss Interest Rate Island: Stylized Facts and a New Interpretation"*, Swiss Review of International Economic Relations* 57, 1, 49-63

Kugler, Peter and Beatrice Weder (2004), "International Portfolio Holdings and Swiss Franc Asset Returns" 2004, *Swiss Journal of Economics and Statistics* 3, 2

Kugler, Peter and Beatrice Weder (2005) "Why Are Returns on Swiss Franc Assets So Low? Rare Events may Solve the Puzzle ", 2005, *Applied Economics Quarterly* 51,3, 231-246

Tsay, R. S.: Testing and Modeling Threshold Autoregressive Processes, Journal of the American Statistical Association 82, 1989.