Modelling International Tourism Demand and Uncertainty in the Maldives and Seychelles: A Portfolio Approach

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EXTENDED ABSTRACT

The sovereign archipelagos of the Maldives and Seychelles in the Indian Ocean are small island tourism economies (SITEs), both of which have small populations and are geographically isolated from the rest of the world. These two SITEs vary profoundly in their territorial size, total land area, prospects for self-reliance in economic development, and an overwhelming reliance on tourism as a source of exports. As a result of time-varying effects such as oil shocks, natural disasters, ethnic conflicts, crime, and the threat of global terrorism, among others, there have been dramatic changes in the arrivals of international tourists to these two countries.

An examination of these variations in international tourism demand, particularly the conditional volatility (or uncertainty) in international tourist arrivals to the Maldives and Seychelles, is essential for policy analysis and tourism marketing purposes. This paper models the conditional mean and the conditional variance of the weekly international tourist arrivals to the Maldives and Seychelles from 1994(1) to 2003(12) from the 5 main European tourist source countries.

Univariate models of uncertainty will be estimated and tested. An assessment and interpretation of the estimates will be made so that policy makers and tour operators would be able to reach optimal decisions on the basis of this portfolio approach to international tourism demand.

The paper also makes an assessment of the country spillover effects between the Maldives and Seychelles. There are four sets of effects that need to be considered: (i) the own country effects for the Maldives and Seychelles; (ii) the country spillover effects from the remaining four countries within each of the Maldives and Seychelles; (iii) the own country spillover effects between the Maldives and Seychelles; and (iv) the cross-country spillover effects between the Maldives and Seychelles. The empirical results for both the Maldives and Seychelles will be discussed in terms of each of these components.

1. INTRODUCTION

The sovereign archipelagos of the Maldives and Seychelles in the Indian Ocean are small island tourism economies (SITEs), both of which have small populations and are geographically isolated from the rest of the world. These two SITEs vary profoundly in their territorial size, total land area, prospects for self-reliance in economic development, and an overwhelming reliance on tourism as a source of exports. As a result of time-varying effects such as oil shocks, natural disasters, ethnic conflicts, crime, and the threat of global terrorism, among others, there have been dramatic changes in the arrivals of international tourists to these two countries. An examination of these variations in international tourism demand, particularly the conditional volatility (or uncertainty) in international tourist arrivals to the Maldives and Seychelles, is essential for policy analysis and tourism marketing purposes. This paper models the conditional mean and the conditional variance of the weekly international tourist arrivals to the Maldives and Seychelles from 1994(1) to 2003(12) from the 5 main European tourist source countries. Univariate models of uncertainty will be estimated and tested. An assessment and interpretation of the estimates will be made so that policy makers and tour operators would be able to reach optimal decisions on the basis of this portfolio approach to international tourism demand.

The structure of the paper is as follows. In Section 2 an overview of the Maldivian and Seychellois economies are presented. This is followed by an assessment of the characteristics of the weekly international tourist arrivals data in Section 3. Empirical examination and the implications of the results for policy and marketing are put forward in Section 4. Concluding remarks are given in Section 5.

2. OVERVIEW OF THE MALDIVIAN AND SEYCHELLOIS ECONOMIES

2.1. Maldives

The Republic of Maldives was a former British protectorate, which became independent in 1965. It is an archipelago in the Indian Ocean, comprising 1,192 islands, of which 199 are inhabited. The Exclusive Economic Zone of the Maldives is 859,000 square kilometres, and the aggregated land area is roughly 290 square kilometres. The total population of the Maldives is 270,101 in the 2000 census, and is estimated to have grown at 2.4 percent per annum over the period 1990 to 2000.

In spite of the small size, limited natural resource base, small population and remoteness, the Maldives has shown an impressive economic growth record over the last 20 years, with an average growth rate of 7 percent per annum. This growth rate enabled the Maldives to attain an estimated real per capita GDP of USD 2,261 in 2003, which is considerably above average for a small island developing country, which has an average per capita GDP of USD 1,500. The engine of growth in the Maldives has been the tourism industry, which is regarded as the most important industry in the economy, accounting for one-fifth of GDP, a third of fiscal revenue, and two-thirds of gross foreign exchange earnings in recent years.

The fisheries sector remains the largest sector in terms of employment, accounting for about one-quarter of the labour force. It is still an important source of foreign exchange earnings. Due to the high salinity content in the soil, agriculture continues to play a minor role. The government, which employs about 20 percent of the labour force, plays a dominant role in the economy, both in the production process and through its regulation of the economy.

2.2. Seychelles

Since independence from the UK in 1976, per capita output in this Indian Ocean archipelago has expanded roughly seven times, from USD 1,000 per capita in 1976 to USD 7,600 today. GDP growth in 2001 was 3.3 per cent. Growth has been led by the tourism sector, which accounts for about 13 per cent of GDP, employs about 30 per cent of the labour force, and provides more than 70 per cent of foreign currency earnings. The vulnerability of the tourist sector was illustrated by the sharp drop in 1991-92, mainly due to the Gulf war. Although the industry has rebounded, the government recognizes the continuing need for upgrading the sector in the face of stiff international competition. Tourist arrivals which are one of the main indicators of vitality in the sector grew by 4.1 per cent in 2000.

A strong marketing effort by the Seychelles Tourism Marketing Authority and the introduction of several new five-star hotels seems to have spurred the growth. Officials hoped that the planned new hotels and expanded airline service to the island would help offset the possibility of reduced global travel following the events of 11 September 2001. In 2003, tourism earnings accounted for USD 680 million and 122,000 visitors, comprising 82 per cent from UK, Italy, France, Germany and Switzerland. Any decline in tourism quickly translates into a fall in GDP, a decline in foreign exchange receipts, and budgetary difficulties. However, the country's

economy is extremely vulnerable to external shocks.

Seychelles not only depends on tourism, but it imports more than 90 per cent of its total primary and secondary production inputs. The manufacturing and construction sectors, including industrial fishing, accounted for about 28.8 per cent of GDP. The public sector, comprising government and state-owned enterprises, dominates the economy in terms of employment (two-thirds of the labour force) and gross revenue. Public consumption absorbs over one-third of the gross GDP. Industrial fishing in Seychelles, notably tuna fishing, is an increasingly significant factor in the economy. Recent changes in the climate have greatly affected the tuna industry due to widespread mobility of tuna schools.

In 1995, Seychelles saw the privatization of the Seychelles Tuna Canning Factory, 60 per cent of which was purchased by the American food company Heinz Inc. Other industrial activities are limited to small scale manufacturing, particularly agro-processing and import substitution. Despite attempts to improve its agricultural base and emphasize locally manufactured products and indigenous materials, Seychelles continues to import 90 per cent of consumption goods. The exceptions are some fruits and vegetables, fish, poultry, pork, beer, cigarettes, paint, and a few locally-made plastic items.

3. DATA CHARACTERISTICS

In this paper, weekly international tourist arrivals data provided by the Ministry of Tourism of the Maldives and National Statistical Bureau of Seychelles for the five main European tourist source countries during the period 1 January 1994 to 31 December 2003 are examined. As shown in Table 1, the five main European tourist source countries for the Maldives in descending order are Italy, Germany, UK France and Switzerland, and accounts for 65% of total international tourist arrivals during the period under analysis. For Seychelles in the same order the five main tourist source countries are France, Germany, Italy, UK and Switzerland, which constitute 66% of total international tourist arrivals during the same period.

Initial assessment of the respective series for unit root test for stationarity using the Phillips-Perron procedure, with truncated lags of order 5 for each of the ten series in levels, rejected the null hypothesis that there is a unit root in the series at 1%, 5% and 10%. Visual examinations of the ten data series reveal that there is strong seasonality presented in European tourist arrivals to the Maldives and Seychelles where the peak tourist season overlaps with the European winter. Furthermore, European tourist arrivals in the Maldives show that there are strong positive trends, owing to the expansion of capacity in the tourism industry of Maldives. However, in the case of Seychelles there are virtually no strong trends present in the data.

4. EMPIRICAL ANALYSIS

The empirical analysis in this paper is based on Engle's (1982) development of time-varying volatility (or uncertainty) using the autoregressive conditional heteroskedasticity (ARCH) model, and subsequent developments associated with the ARCH family of models. McAleer (2005) provides an extensive comparison of univariate and multivariate conditional volatility models, including a discussion of the regularity conditions required for sensible empirical practice. The univariate VARMA(p,q)-GARCH(1,1) model is used to estimate the spillover effects of weekly international tourist arrivals over the period 1994-2003, for the five main European tourist source countries from and within the Maldives and Seychelles. Tables 2 and 3 presents the empirical results for the different conditional means and also displays the spillover effects for the respective time series.

All the estimates in this paper are obtained using EViews 4.1. The Berndt, Hall, Hall, and Hausman (BHHH) (1974) algorithm has been used in most cases, but the Marquardt algorithm is used when the BHHH algorithm does not converge. Several different sets of initial values have been used in each case, but do not lead to substantial differences in the estimates. The asymptotic and robust t-ratios (see Bollerslev and Wooldridge (1992) for the derivation of the robust standard errors) for the QMLE are reported in Tables 2 and 3. There are 3 entries for each estimate, namely the coefficient (in bold), the Bollerlev-Wooldridge (1992) robust t-ratio, and the asymptotic t-ratio. In general, the robust t-ratios are smaller in absolute value than their asymptotic counterparts.

In examining the country spillover effects between the Maldives and Seychelles, there are four sets of effects that need to be considered: (i) the own country effects for the Maldives and Seychelles; (ii) the country spillover effects from the remaining four countries within each of the Maldives and Seychelles; (iii) the own country spillover effects between the Maldives and Seychelles; and (iv) the cross-country spillover effects between the Maldives and Seychelles.

The empirical results for both the Maldives and Seychelles will be discussed in terms of each of these components, as follows.

4.1. Maldives

(i) Own-country effects

The magnitudes of the long run own-country effect are greater than the short run country effect. The short run and long run own country effects of the 5 main European tourist source countries to the Maldives are generally very reasonable and statistically significant except for the long run own country effect of Italy.

(ii) Country spillover effects from four countries

There is little evidence to suggest that there are country spillover effects from the remaining four countries within the Maldives. However, the estimates are generally reasonable.

(iii) Own-country spillover effects

The own-country spillover effects of weekly tourist arrivals from the same 5 source countries in Seychelles that affect tourist arrivals in the Maldives are mixed and there are some unreasonable estimates. However, the short run own country spillover effect of German tourist arrivals in Seychelles is twice that of the own effect of German tourist arrivals to the Maldives. Conversely, the short run cross country spillover effect of French tourist arrivals in Seychelles is half that of the own country effect of French tourist arrivals to the Maldives. These results are indicative of the strong influence of German and French tourist arrivals to these two SITEs in the short term.

(iv) Cross-country spillover effects

There is reasonable evidence to suggest that there are cross country spillover effects from Seychelles to the Maldives, and vice versa. Overall, the spillover effects from Seychelles to the Maldives are greater than the spillover effects from Maldives to Seychelles.

4.2. Seychelles

(i) Own-country effects

In the case of Seychelles, the absolute values of the long run own country effects are greater than the short run own country effects. Moreover, the short run and long run own country effects of the 5 main European tourist source countries to Seychelles are also satisfactory and statistically significant.

(ii) Country spillover effects from four countries

In Seychelles there are not many country spillover effects from the remaining four countries. Nevertheless, the estimates are of reasonable order of magnitude.

(iii) Own-country spillover effects

The own country spillover effects of weekly tourist arrivals from the same 5 source countries in Maldives, that affect tourist arrivals in the Seychelles are mixed and the order of magnitude of some of the estimates are unsatisfactory. However, the short run and long run own country spillover effect of German and British tourist arrivals in Seychelles is statistically significant. Furthermore, the long run own country spillover effect of Switzerland is also statistically significant. These results are indicative of the strong influence of German and French tourist arrivals both in the short and long run and British tourist arrivals in the long to these two SITEs.

(iv) Cross-country spillover effects

The estimates for he cross-country spillover effects are mixed and it is reasonable to suggest that there is little or no spillover effects from Maldives to Seychelles. By and large, the spillover effects from the Maldives to Seychelles are greater than the own country spillover effects of Seychelles.

5. CONCLUSION

The paper assessed the country spillover effects between the Maldives and Seychelles in terms of the own country effects, the country spillover effects from the remaining four countries, the own country spillover effects; and the cross-country spillover effects.

6. ACKNOWLEDGMENTS

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Figure 1: Weekly European Tourist Arrivals to the Maldives and Seychelles 1994-2003

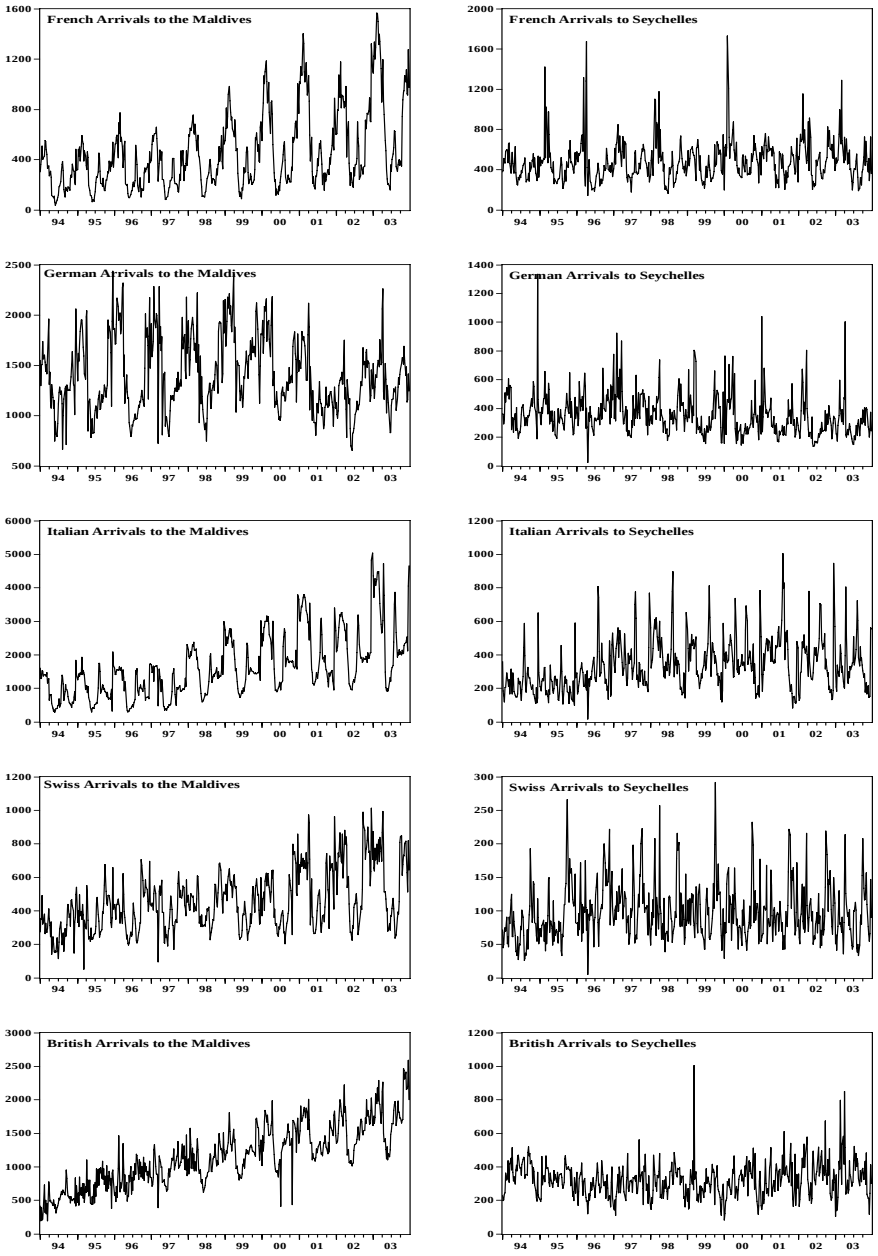

Table 1: Composition of Tourists in the Maldives and Seychelles 1994-2003

MALDIVES			SEYCHELLES		
Tourist Source	**Head Count**	**Proportion**	**Tourist Source**	**Head Count**	**Proportion**
1 **Italy**	983,433	**20.85**	**France**	255,379	**20.29**
2 **Germany**	803,420	**17.03**	**Germany**	185,286	**14.72**
3 **UK**	717,492	**15.21**	**Italy**	177,795	**14.12**
4 Japan	428,313	9.08	**UK**	172,757	**13.72**
5 **France**	284,794	**6.04**	**Switzerland**	51,075	**4.06**
6 **Switzerland**	266,497	**5.65**	South Africa	48,302	3.84
7 Austria	131,383	2.78	Spain	36,460	2.90
8 Nether.	66,650	1.41	Scandinavia	31,815	2.53
9 Spain	57,051	1.21	Reunion	28,715	2.28
10 Russia	67,071	1.42	Mauritius	26,070	2.07
Total	**4,717,744**	**80.68**	**Total**	**1,258,857**	**80.52**

Table 2: Spillover Effects within the Maldives and from Seychelles

Tourist Source	Conditional Mean		CONDITIONAL VARIANCE																			
			Own Effects			Spillovers within the Maldives								Spillovers from Seychelles									
France	**AR(1)**	**AR(2)**	ω	α_{FR}	β_{FR}	α_{GR_M}	β_{GR_M}	α_{IT_M}	β_{IT_M}	α_{SW_M}	β_{SW_M}	α_{UK_M}	β_{UK_M}	α_{FR_S}	β_{FR_S}	α_{GR_S}	β_{GR_S}	α_{IT_S}	β_{IT_S}	α_{SW_S}	β_{SW_S}	α_{UK_S}	β_{UK_S}
	0.71	**0.21**	**-2,105.63**	**0.08**	**0.83**	**-4.7E-03**	**-0.01**	**-4.7E-03**	**-4.7E-03**	**0.02**	**0.23**	**0.01**	**-0.02**	**0.01**	**-0.02**	**-0.02**	**0.01**	**0.21**	**-0.17**	**0.26**	**2.44**	**0.01**	**-0.01**
	13.51	4.12	-0.46	3.20	27.12	-1.98	-1.78	-0.38	-0.09	0.42	2.03	1.02	-4.25	8.53	-7.22	-8.18	0.75	4.27	-4.03	1.32	0.56	0.45	-0.51
	8.66	2.37	-0.54	1.58	8.44	-1.06	-11.05	-0.32	-0.08	0.30	0.78	0.70	-0.44	2.27	-21.30	-0.38	0.15	2.73	-2.84	1.00	0.60	0.40	-0.39
Germany	**AR(1)**	**AR(2)**	ω	α_{GR}	β_{GR}	α_{FR_M}	β_{FR_M}	α_{IT_M}	β_{IT_M}	α_{SW_M}	β_{SW_M}	α_{UK_M}	β_{UK_M}	α_{FR_S}	β_{FR_S}	α_{GR_S}	β_{GR_S}	α_{IT_S}	β_{IT_S}	α_{SW_S}	β_{SW_S}	α_{UK_S}	β_{UK_S}
	0.50	**0.07**	**-28,368.38**	**0.12**	**0.68**	**0.18**	**-0.43**	**-0.01**	**-4.7E-03**	**0.11**	**0.09**	**-0.01**	**-0.37**	**0.10**	**-0.05**	**0.25**	**0.06**	**0.50**	**-0.41**	**-1.05**	**47.73**	**0.12**	**0.32**
	7.99	1.12	-3.44	2.56	7.92	0.86	-1.63	-0.92	-0.15	0.39	0.18	-0.20	-1.69	1.37	-0.62	0.99	0.25	2.02	-2.25	-0.68	45.70	0.43	0.55
	8.40	1.08	-1.30	2.09	8.77	1.82	-3.25	-1.64	-0.11	0.56	0.23	-0.80	-5.68	1.59	-1.29	1.88	0.40	2.43	-2.03	-0.98	2.26	1.06	0.83
Italy	**AR(1)**	**AR(2)**	ω	α_{IT}	β_{IT}	α_{FR_M}	β_{FR_M}	α_{GR_M}	β_{GR_M}	α_{SW_M}	β_{SW_M}	α_{UK_M}	β_{UK_M}	α_{FR_S}	β_{FR_S}	α_{GR_S}	β_{GR_S}	α_{IT_S}	β_{IT_S}	α_{SW_S}	β_{SW_S}	α_{UK_S}	β_{UK_S}
	0.95		**-72,747.83**	**0.25**	**-4.7E-03**	**0.30**	**-0.32**	**0.04**	**-0.22**	**0.27**	**2.92**	**0.03**	**3.28**	**-0.06**	**-0.17**	**0.23**	**-0.24**	**4.13**	**3.08**	**-2.76**	**-23.41**	**-0.18**	**1.61**
	12.60		-1.86	2.78	0.03	0.57	-0.46	0.33	-1.48	0.59	1.76	0.27	3.12	-2.29	-2.30	0.93	-0.68	11.36	2.95	-1.00	-1.07	-2.27	0.86
	17.28		-2.69	2.58	0.04	1.07	-0.41	0.75	-3.11	1.13	2.40	0.63	3.52	-21.01	-9.69	0.83	-3.20	4.20	2.71	-4.00	-2.36	-2.47	1.58
Switz.	**AR(1)**	**AR(2)**	ω	α_{SW}	β_{SW}	α_{FR_M}	β_{FR_M}	α_{GR_M}	β_{GR_M}	α_{IT_M}	β_{IT_M}	α_{UK_M}	β_{UK_M}	α_{FR_S}	β_{FR_S}	α_{GR_S}	β_{GR_S}	α_{IT_S}	β_{IT_S}	α_{SW_S}	β_{SW_S}	α_{UK_S}	β_{UK_S}
	0.60	**0.22**	**4,147.21**	**0.09**	**0.81**	**-0.06**	**0.12**	**0.01**	**-0.03**	**0.01**	**-0.01**	**0.01**	**-0.07**	**0.02**	**-0.02**	**-0.01**	**0.01**	**0.08**	**-0.06**	**-0.07**	**-0.19**	**-4.7E-03**	**-4.7E-03**
	8.52	3.06	0.55	1.80	10.46	-1.71	2.28	1.21	-1.84	0.64	-1.09	1.51	-55.38	1.46	-1.97	-0.81	0.94	1.05	-0.87	-0.19	-0.03	-0.08	0.01
	11.84	5.00	1.57	3.46	15.90	-2.65	3.01	1.85	-2.64	2.73	-3.46	1.43	-4.33	1.37	-1.53	-1.81	2.01	2.16	-1.86	-0.35	-0.07	-0.36	0.02
UK	**AR(1)**	**AR(2)**	ω	α_{UK}	β_{UK}	α_{FR_M}	β_{FR_M}	α_{GR_M}	β_{GR_M}	α_{IT_M}	β_{IT_M}	α_{SW_M}	β_{SW_M}	α_{FR_S}	β_{FR_S}	α_{GR_S}	β_{GR_S}	α_{IT_S}	β_{IT_S}	α_{SW_S}	β_{SW_S}	α_{UK_S}	β_{UK_S}
	0.53	**0.41**	**22,127.04**	**0.11**	**0.75**	**0.15**	**0.15**	**-0.01**	**-0.03**	**-0.02**	**-4.7E-03**	**0.17**	**-0.42**	**0.05**	**-0.06**	**0.22**	**-0.09**	**0.13**	**-0.16**	**1.56**	**-13.33**	**-0.08**	**-0.04**
	11.23	8.93	1.58	2.90	11.03	1.64	1.02	-0.72	-1.09	-2.29	0.82	1.28	-1.46	1.00	-2.08	1.41	-0.77	1.46	-1.95	1.79	-0.97	-0.88	-0.35
	11.12	8.63	10.19	3.28	11.16	1.00	0.80	-0.60	-1.45	-1.97	0.82	0.76	-1.10	1.06	-1.74	1.94	-1.08	1.60	-2.07	1.28	-46.13	-1.29	-0.34

Note: The three entries corresponding to each parameter are their estimates (in bold), their asymptotic t-ratios, and the Bollerslev and Wooldridge (1992) robust t-ratios, respectively.

Table 3: Spillover Effects within Seychelles and from the Maldives

Tourist Source	Conditional Mean		CONDITIONAL VARIANCE																		
			Own Effects			Spillovers within Seychelles								Spillovers from the Maldivess								
France	**AR(1)**	**AR(2)**	ω	α_{FR}	β_{FR}	α_{GR_S}	β_{GR_S}	α_{IT_S}	β_{IT_S}	α_{SW_S}	β_{SW_S}	α_{UK_S}	β_{UK_S}	α_{FR_M}	β_{FR_M}	α_{GR_M}	β_{GR_M}	α_{IT_M}	β_{IT_M}	α_{SW_M}	β_{SW_M}	α_{UK_M}	β_{UK_M}
	0.27		**4,810.69**	**0.21**	**0.54**	**-0.02**	**0.16**	**0.05**	**-0.05**	**0.05**	**-3.17**	**0.03**	**-0.01**	**-0.01**	**0.18**	**-0.01**	**-0.04**	**-0.01**	**-4.7E-03**	**0.07**	**0.07**	**0.11**	**-0.03**
	4.44		2.68	3.29	5.59	-2.74	2.75	1.30	-1.39	0.08	-0.97	0.39	-0.03	-0.11	1.65	-0.46	-1.83	-1.20	-0.11	0.69	0.33	2.80	-0.25
	5.06		0.71	3.67	9.51	-2.10	2.26	2.59	-12.35	0.18	-0.50	0.58	-0.05	-0.16	1.77	-2.00	-3.57	-2.12	-0.19	1.17	0.55	4.13	-0.34
Germany	**AR(1)**	**AR(2)**	ω	α_{GR}	β_{GR}	α_{FR_S}	β_{FR_S}	α_{IT_S}	β_{IT_S}	α_{SW_S}	β_{SW_S}	α_{UK_S}	β_{UK_S}	α_{FR_M}	β_{FR_M}	α_{GR_M}	β_{GR_M}	α_{IT_M}	β_{IT_M}	α_{SW_M}	β_{SW_M}	α_{UK_M}	β_{UK_M}
	0.17	**0.13**	**-3,496.44**	**0.08**	**0.64**	**0.03**	**-0.01**	**0.07**	**-0.06**	**-0.53**	**13.21**	**0.05**	**-0.17**	**0.04**	**-0.11**	**0.05**	**-0.07**	**-0.01**	**-4.7E-03**	**0.09**	**0.06**	**-0.01**	**-0.09**
	2.26	1.67	-0.74	1.19	4.34	1.50	-1.46	1.01	-0.92	-1.14	3.92	1.07	-1.84	0.73	-1.41	3.71	-4.34	-2.98	2.07	0.84	0.22	-0.67	-0.76
	3.41	2.67	-0.54	2.21	5.52	1.55	-1.02	1.74	-1.40	-1.55	2.46	0.54	-2.49	1.10	-1.76	2.43	-4.06	-5.72	4.06	2.27	0.38	-1.66	-1.42
Italy	**AR(1)**	**AR(2)**	ω	α_{IT}	β_{IT}	α_{FR_S}	β_{FR_S}	α_{GR_S}	β_{GR_S}	α_{SW_S}	β_{SW_S}	α_{UK_S}	β_{UK_S}	α_{FR_M}	β_{FR_M}	α_{GR_M}	β_{GR_M}	α_{IT_M}	β_{IT_M}	α_{SW_M}	β_{SW_M}	α_{UK_M}	β_{UK_M}
	0.56	**-0.11**	**56.81**	**0.27**	**0.31**	**-4.7E-03**	**0.01**	**0.04**	**-0.05**	**-0.77**	**10.30**	**-0.04**	**0.07**	**0.08**	**-0.10**	**0.01**	**-4.7E-03**	**-4.7E-03**	**-4.7E-03**	**-0.04**	**0.17**	**-4.7E-03**	**0.02**
	6.14	-1.31	0.00	1.66	1.00	-0.11	0.27	0.67	-0.72	-0.95	0.84	-0.64	0.21	0.69	-0.45	0.30	-0.03	0.04	-0.71	-0.45	0.49	0.08	0.28
	10.26	-2.07	0.01	3.40	2.81	-0.29	0.39	0.77	-1.88	-2.57	1.65	-3.34	1.02	1.26	-1.12	0.58	-0.08	0.11	-5.99	-1.18	1.26	0.17	0.11
Switz.	**AR(1)**	**AR(2)**	ω	α_{SW}	β_{SW}	α_{FR_S}	β_{FR_S}	α_{GR_S}	β_{GR_S}	α_{IT_S}	β_{IT_S}	α_{UK_S}	β_{UK_S}	α_{FR_M}	β_{FR_M}	α_{GR_M}	β_{GR_M}	α_{IT_M}	β_{IT_M}	α_{SW_M}	β_{SW_M}	α_{UK_M}	β_{UK_M}
	0.26	**-0.14**	**697.29**	**0.05**	**0.58**	**-4.7E-03**	**-4.7E-03**	**-4.7E-03**	**-4.7E-03**	**-0.01**	**-4.7E-03**	**0.01**	**-0.01**	**-4.7E-03**	**-0.01**	**-4.7E-03**	**-4.7E-03**	**-4.7E-03**	**-4.7E-03**	**-4.7E-03**	**-0.01**	**-4.7E-03**	**-4.7E-03**
	4.94	-2.80	2.65	1.12	4.05	2.42	-1.34	-0.34	0.22	-3.72	0.10	1.87	-1.56	0.02	-0.93	1.02	-2.83	1.05	-0.11	0.52	-1.28	-0.41	0.31
	5.30	-3.10	9.35	1.37	77.34	2.18	-2.08	-2.62	0.98	-18.66	0.18	2.59	-3.06	0.04	-1.73	1.96	-4.24	3.89	-0.19	1.33	-8.15	-0.81	1.30
UK	**AR(1)**	**AR(2)**	ω	α_{UK}	β_{UK}	α_{FR_S}	β_{FR_S}	α_{GR_S}	β_{GR_S}	α_{IT_S}	β_{IT_S}	α_{UK_S}	β_{UK_S}	α_{FR_M}	β_{FR_M}	α_{GR_M}	β_{GR_M}	α_{IT_M}	β_{IT_M}	α_{SW_M}	β_{SW_M}	α_{UK_M}	β_{UK_M}
	0.29	**0.10**	**847.16**	**0.12**	**0.74**	**0.02**	**-0.02**	**-0.01**	**0.01**	**0.01**	**-4.7E-03**	**-0.13**	**1.48**	**-0.01**	**0.13**	**-4.7E-03**	**0.01**	**-4.7E-03**	**-4.7E-03**	**-0.05**	**0.02**	**0.02**	**-0.08**
	4.33	1.47	0.18	1.76	7.43	1.32	-2.42	-0.96	0.98	0.36	0.10	-0.75	0.33	-0.29	1.91	-0.65	0.73	0.60	-1.04	-1.63	0.29	1.63	-1.82
	5.33	1.84	0.44	2.69	14.87	4.86	-14.06	-4.96	1.16	0.50	0.16	-0.82	0.80	-0.52	3.05	-1.78	1.28	1.55	-4.24	-4.05	0.63	2.70	-2.48

Note: The three entries corresponding to each parameter are their estimates (in bold), their asymptotic t-ratios, and the Bollerslev and Wooldridge (1992) robust t-ratios, respectively.