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Short-term exchange-rate effects of capital flows in a small open economy with pure exchange-rate targeting: Empirical evidence from Denmark's recent exchange-rate history 1984-2004

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Kim Abildgren

Danmarks Nationalbank

**Short-Term Exchange-Rate Effects of
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– Empirical Evidence from Denmark's Recent
Exchange-Rate History 1984-2004**

March 2007

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Short-Term Exchange-Rate Effects of Capital Flows in a Small Open Economy With Pure Exchange-Rate Targeting

**– Empirical Evidence from Denmark’s Recent Exchange-Rate
History 1984-2004¹**

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Abstract

Utilising a unique data set on monthly private cross-border portfolio gross and net flows to and from Denmark 1984-2004 the paper analyses the short-term relationship between capital flows related to portfolio investments and changes in the Danish nominal krone rate vis-à-vis the euro (D-mark prior to 1999). The main finding is that portfolio investments are important to short-term exchange-rate determination and that the sign of the estimated effect is as expected: Net inflows of capital strengthen the exchange rate. This result is robust to divisions of the data sample into sub-periods as well as to the inclusion of central-bank interventions in the foreign-exchange market and changes in the short-term interest-rate spread vis-à-vis the currency anchor as endogenous explanatory variables. Portfolio flows in Danish bonds appear to be driving the results prior to the introduction of the euro. Since then the main driver has been portfolio investments in foreign shares. Over time there appears to have been a declining effect on the krone-rate from portfolio flows which might be seen as the result of increased credibility of the Danish exchange-rate peg.

Key words: Portfolio flows; FX microstructure; Exchange-rate dynamics.

JEL Classification: E52, F31, F32.

Resumé (Danish summary)

I papiret analyseres den kortsigtede sammenhæng mellem kapitalbevægelser relateret til grænseoverskridende porteføljeinvesteringer og ændringer i kronekursen over for euro (D-mark før 1999) på baggrund af et unikt datasæt over månedlige private brutto og netto porteføljestrømme til og fra Danmark 1984-2004. Hovedresultatet af analysen er, at porteføljeinvesteringer er vigtige for den kortsigtede valutakursdannelse, og at fortegnet på den estimerede effekt er som forventet: Nettoindstrømning af kapital styrker kronekursen. Dette resultat er robust over for en opdeling af datamaterialet i delperioder samt inddragelse af Nationalbankens interventioner i valutamarkedet og ændringer i det korte rentespænd over for valutaankeret som endogene forklarende variable. Porteføljeinvesteringer i danske obligationer synes at være afgørende for resultatet i perioden før introduktionen af euroen. Siden har porteføljestrømme i udenlandske aktier været mest afgørende. Effekten på kronekursen fra porteføljestrømme synes at have aftaget over tid, hvilket kan skyldes fastkurspolitikens øgede troværdighed.

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1. Introduction

Traditional models of exchange-rate determination focus on macroeconomic fundamentals such as differentials in interest-rates, inflation, money growth, current account balances, and economic growth. Furthermore, such models are implicitly based on the assumption that all information relevant for exchange-rate determination is publicly available and immediately reflected in the exchange rate. However, empirically the macroeconomic approach has had rather great difficulties at outperforming a random walk in explaining short-term exchange-rate movements, cf. the survey in Sarno & Taylor (2002).

During the past decade or so the microstructure literature on exchange-rate determination has highlighted the importance of trading institutions, order flows and the spread of information in the foreign exchange (FX) markets to short-term exchange-rate behaviour, cf. e.g. Lyons (2001). The basic line of reasoning is that trading in many FX markets largely takes place on a decentralised (OTC²) basis between market participants (mainly market makers³, brokers⁴, customers⁵ and central banks). Within this setting a market maker may extract information on e.g. trends in supply and demand of foreign exchange from order flows and central-bank interventions. The market maker can utilise this information to adjust his prices for purchasing and selling foreign exchange in order to avoid an undesirably large or small FX inventory. An overweight of purchase orders pushes prices up, while prices are reduced if there is an overweight of sales orders. Furthermore, the market maker may use private information extracted from order flows for trade positions for own account with the aim of making a profit (proprietary trading).

The microstructure approach should not be seen as an alternative theory of foreign-exchange-rate determination compared to the macroeconomic approach, cf. e.g. Gereben et al. (2005). Ultimately, order flows probably mainly depend on the economic agents expectations regarding future macroeconomic fundamentals. The microstructure approach focuses on the process by which changes in such expectations are transmitted into the actual exchange rates via order flows and basic supply-demand forces.

Microstructure-inspired empirical studies seem to have had at least some success in explaining short-term exchange-rate fluctuations and basically two fundamentally different data approaches have been used to explore the relationship between FX order flows and exchange-rate movements: A “direct” approach and an “indirect” one.

² Over-The-Counter, i.e. trading outside a centralised exchange.

³ Market makers are banks that to quote binding two-way prices within fixed maximum bid/ask spreads and for certain amounts.

⁴ Brokers are agents acting as intermediaries between buyers and sellers without themselves being part of the transactions. An inter-dealer broker mainly collects and receives orders from the market makers. A large broker may in reality serve as a centralised market place and may be electronic.

One strand of research is based directly on FX-transaction data from an individual bank⁶, an electronic foreign-exchange broker⁷ or from special statistics covering all or most of the FX transactions in a small currency area⁸. The main advantage of this approach is that the data sets concern actual FX transactions. Furthermore, these kinds of data sets usually contain detailed information on each transaction (e.g. the side of the trade⁹, the initiator of the trade¹⁰, transaction price and size, the type of customer, etc.). They are also often recorded at a very high frequency, e.g. time-stamped transaction data or at least data on a daily frequency. The main drawback of the direct approach is, firstly, that the data sets applied most often only cover a minor share of all FX transactions in the currency pair under study and, secondly, that public access to such data sources may be very restricted, e.g. due to confidentiality of customer transactions or simply the proprietary nature of the data.

The indirect approach utilises public information on e.g. portfolio investments or direct investments from the financial accounts of the balance of payments statistics or equivalent sources¹¹ as proxies for FX order flows. Such data sets give a complete picture of all cross-border financial transactions, although usually at a lower data frequency (monthly or quarterly data) and with limited breakdowns on instruments, counterparty sector and customer's residence. However, certain capital flows may not even give rise to FX transactions at all. Direct investments linked to mergers and acquisitions (M&A) may e.g. partly be settled by equity swaps ("payment" in shares) rather than cash.¹² Furthermore, the influence on the exchange rate from e.g. portfolio investments may depend on the degree to which the exchange-rate risks are hedged by other financial instruments.¹³ Being one step away from the actual FX transactions the indirect approach thus also has its limitations.

⁵ E.g. pension funds, investment funds, non-financial enterprises and non-market-making banks.

⁶ Evans & Lyons (2006) utilise e.g. Citybank customer transaction-level order flows (aggregated to a daily frequency) in the USD/euro area spot and forward market 1993-1999. Citybank's market share at that time was estimated to be around 10-15 per cent in the relevant segment.

⁷ Killeen et al. (2006) use for example daily data on brokered interdealer purchases and sales in the FRF/DEM spot market in 1998 from Electronic Broking Services (EBS). The market share by EBS was estimated to be around 20 per cent in the segment at that time.

⁸ Gereben et al. (2006) utilise e.g. data from the Daily Foreign Exchange Report 2001-2006 of the central bank in Hungary covering the major foreign-exchange transactions carried out by commercial banks resident in Hungary. Rime (2006) utilises a daily data set from 2005-2006 reported to Norges Bank by participants in the NOK foreign-exchange market. Hansen & Storgaard (2005) uses daily data for the period December 2004 to April 2005 on the foreign-exchange turnover vis-à-vis Danish kroner (customer transactions) reported by a group of major Danish banks.

⁹ I.e. buy or sell order.

¹⁰ I.e. the market maker or the customer. The initiator in a FX deal is often denoted the "aggressor".

¹¹ Siourounis (2003), Brooks et al. (2004) and Hau & Rey (2006) use e.g. monthly or quarterly US data on net cross-border capital flows since the 1980s.

¹² Furthermore, the exchange-rate impact related to M&A activities may also take place quite some time before the actual transactions due to market participants taking positions based on rumours of – or announcement of – M&A activities, cf. Jayaswal, Kornvig & Skjærbæk (2006) for a recent case study in a Danish context.

¹³ Assume e.g. that a Danish insurance company makes a spot purchase of foreign bonds denominated in euro from a foreign investor. The Danish insurance company purchases euro vis-à-vis kroner in the FX spot market in order to pay for the transaction. However, the Danish insurance company may choose to hedge the foreign-exchange risk by a sale of euro vis-à-vis kroner on a forward basis to a Danish bank. The bank will normally not assume the

Trading in the Danish foreign-exchange market for Danish kroner solely take place OTC and the market structure fits quite well with the main line of thinking in the microstructure literature.¹⁴ A priori one should therefore expect that order flows might have an effect on the short-term behaviour of the krone exchange rate. Hansen & Storgaard (2005) have analysed the short-term relationship between private cross-border capital flows to and from Denmark and the development in the Danish nominal krone rate vis-à-vis the euro in the period 1999-2004 using data on a monthly frequency from Danmarks Nationalbank's payment statistics. They find a significant relationship between the krone rate and portfolio flows but no impacts from direct investments or other capital flows. The exchange-rate impact from portfolio flows is also confirmed by Hansen and Storgaard, *op.cit.* in a data set on a weekly frequency.

Utilising a unique data set on monthly cross-border portfolio gross and net flows 1984-2004 broken down by instruments compiled on the basis of Danmarks Nationalbank's payment statistics the paper at hand complements the study in Hansen and Storgaard, *op.cit.*, by analysing a longer historical time span characterised by (almost) fully liberalised portfolio flows and a strategy of pure exchange-rate targeting in Denmark.

The rest of this paper is organised as follows: Section 2 briefly describes the developments over the most recent decades in restrictions on cross-border portfolio flows to and from Denmark and in the Danish exchange-rate policy. Section 3 offers a short description of the main features of the data set and gives an overview of the main trends in the variables. The empirical findings regarding the exchange rate and portfolio flows are presented in section 4 whereas section 5 checks the robustness of the results to a specification where Danmarks Nationalbank's intervention in the krone-denominated foreign-exchange market and changes in the short-term money-market interest-rate spread vis-à-vis the currency anchor are taken into consideration. Finally section 6 concludes on the key finding of the paper and discusses possible policy conclusions.

2. The Danish road to free capital flows and pure exchange-rate targeting

During the Bretton Woods period portfolio investments to and from Denmark required permission from the Danish monetary authorities. With the Danish membership of EEC in 1973 Denmark became subject to EEC's capital directives. This initiated a gradual process

exchange-rate risk in relation to such forward contracts by holding open net positions. Instead the bank will usually hedge the transactions by an offsetting contract, i.e. sell euro vis-à-vis kroner in the FX spot market. The net demand for euro vis-à-vis kroner in the FX spot market is therefore zero, whereas the cross-border portfolio flow data from the financial accounts of the balance of payments statistics will show a net outflow of capital from Denmark indicating a net demand for euro vis-à-vis kroner.

¹⁴ The current microstructure of the Danish krone-denominated foreign-exchange market is covered in detail by Abildgren (2006a). Earlier descriptions are found in Danmarks Nationalbank (2003), Krabbe & Pedersen (1998), and Kolte & Jensen (1991).

with deregulation of cross-border portfolio flows to and from Denmark. In January 1973 non-residents were given free access to buy Danish exchange-listed portfolio shares and in December 1974 also Danish exchange-listed bonds (with an original maturity of more than 2 years). However, in February 1979 this permission was abolished again regarding krone-denominated Danish central-government bonds issued since 1975. In May 1983 non-residents once again was granted permission to buy krone-denominated Danish central-government bonds (with an original maturity of more than 2 years). Furthermore, in May 1983 non-residents purchase of Danish non-exchange-listed shares was liberalised. In January 1978 residents got permission to purchase exchange-listed bonds issued by international organisations of which Denmark was a member and in May 1983 this permission was extended to cover all exchange-listed foreign bonds (with an original maturity of more than 2 years). In January 1984 residents were granted free access to purchase exchange-listed foreign shares. Purchase and sale of foreign exchange on a forward basis was also almost fully liberalised with effect from January 1984. The last restrictions on cross-border portfolio flows – mainly concerning non-residents purchase of Danish Treasury notes and other Danish money market papers and resident’s purchase of non-listed foreign shares – were removed in October 1988.¹⁵

The early 1980s also witnessed a fundamental change in the Danish exchange-rate policy¹⁶ and the fiscal-policy regime.¹⁷ After the breakdown of the Bretton Woods system in the beginning of the 1970s, the Danish exchange-rate policy became part of the European exchange-rate co-operation, first within the “Currency Snake” founded in 1972 and subsequently from 1979 within the European Exchange Rate Mechanisms (ERM I and from 1999 ERM II). The oil price shocks of the 1970s and frequent devaluations of the krone during the late 1970s and the beginning of the 1980s caused a continuation of the upward trend in inflation and a widening of the long-term interest spread between Denmark and its main trading partners. Danish government bond yields reached a post-1875 all time high of 22.11 per cent in 1982. The government debt increased rapidly, and a fear that Denmark was on the verge of “state bankruptcy” began to rise. In the beginning of the 1980s the yield on long-term Danish government bonds exceeded the yield on long-term Danish mortgage-credit bonds for the first time since the period around World War I.¹⁸ This highlights the extent of the crisis in the Danish economy at the beginning of the 1980s. In September 1982 the incoming Danish government announced the abolishment of devaluation as an economic-policy instrument, wage indexation was abolished and the fiscal policy became oriented

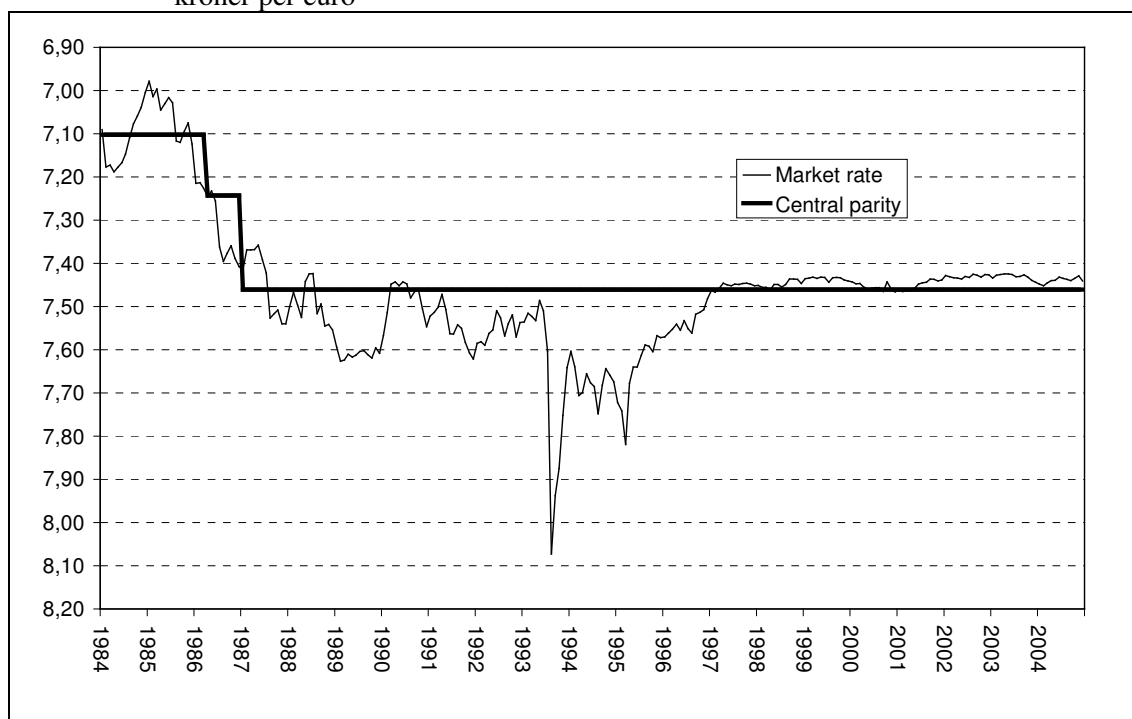
¹⁵ For a review of the liberalisation of cross-border capital movements in Denmark in the period 1950-1988, cf. Hald & Jensen (1986), Chapter II in Det Økonomiske Råd. Formandskabet (1985) and Biltoft-Jensen (1991).

¹⁶ Cf. Abildgren (2005c) and references therein.

¹⁷ Cf. Abildgren (2006b).

towards medium-term stability. The Deutsche Mark was revalued several times within the ERM I in the period 1982-1987, including vis-à-vis the krone, but never on the initiative of Denmark. The last realignments of the central parity for Danish kroner vis-à-vis Deutsche Mark within ERM I occurred in the beginning of 1987. Since then Denmark pursued a “hard” peg against the D-mark and later the euro within ERM II¹⁹, despite major devaluations during the 1990s by some of Denmark’s main trading partners, cf. figure 1. The increased credibility of the Danish fixed-exchange-rate policy and the international decline of inflation rates during the 1980s and the beginning of the 1990s caused a marked downward trend in both inflation and nominal interest rates in Denmark. The long-term interest spread between Denmark and Germany decreased rapidly from more than 13 per cent in 1982 to less than 1 per cent in 1991 and 0.22 per cent in 2004, and since the early 1990s the level of inflation in Denmark has roughly been equal to that of Germany and since 1999 the euro area.

Figure 1: Bilateral exchange rate and central parity vis-à-vis the euro 1984-2004, Danish kroner per euro



Note: End of month. Reversed scale. Before 1999 a synthetic krone rate vis-à-vis the euro is applied, calculated on the basis of the krone rate vis-à-vis the D-mark and the D-mark-to-euro conversion rate fixed at 1 January 1999.

Sources: See appendix A.

For the whole period since 1984 the Danish economy can be characterised as a small open economy with (almost) fully liberalised private cross-border portfolio flows and an

¹⁸ Cf. Abildgren (2005b).

¹⁹ The central parity of kroner within ERM II (7.46038 kroner per euro) corresponds exactly to the central parity rate vis-à-vis Deutsche Mark from 1987. Danmarks Nationalbank (2003) offers more details on ERM I and II, including the differences and similarities between the two exchange-rate mechanisms.

unchanged monetary-policy regime oriented towards pure exchange-rate targeting vis-à-vis the D-mark and later the euro. This part of Denmark's recent exchange-rate history is therefore particularly suitable for an empirical analysis of the exchange-rate effect from portfolio flows within a fixed exchange-rate regime.

3. Data description and trends in the key variables

For the analysis in this paper a data set on monthly gross and net capital flows related to cross-border portfolio investments 1984-2004 broken down by four categories (Danish shares, Danish bonds *etc.*, foreign shares and foreign bonds *etc.*) has been constructed on the basis of Danmarks Nationalbank's payment statistics. During the whole period 1984-2004 the Nationalbank's payment statistics was mainly compiled on the basis of information from a large number of Danish foreign-exchange dealers²⁰ on all cross-border portfolio transaction (a so-called ticket system²¹). This information was supplemented by reports from Danish non-financial firms²² and private individuals on cross-border portfolio transactions made via accounts held abroad. Prior to 1998 the reporting system was entirely paper based making the system increasingly more costly to administrate – both for the foreign-exchange dealers and the Nationalbank – in step with the strong increase in cross-border capital flows. In 1998 an electronic reporting system was introduced but the main principles (reporting of every transactions) remained unchanged. In the early period of the new electronic system around 4,400 securities transactions was on average reported each day, cf. Tryde (1999).

Fundamentally, the origin of the ticket-based payment-statistics reporting system can be traced back to the period before portfolio flows were liberalised and payments across borders required permission from the Danish monetary authorities. Since then a number of other statistics (e.g. MFI statistics and security statistics based on reporting by custodian institutions) have evolved significantly and can now also be used as a source for the financial accounts on the balance of payment statistics. With effect from 2005 the Nationalbank's ticket-based payment-statistics reporting system was therefore abolished and the statistics on capital flows are now drawn from other sources.²³ As a consequence information on cross-border gross capital flows are no longer published which is the reason why the data sample behind the analysis in the paper at hand ends in 2004.

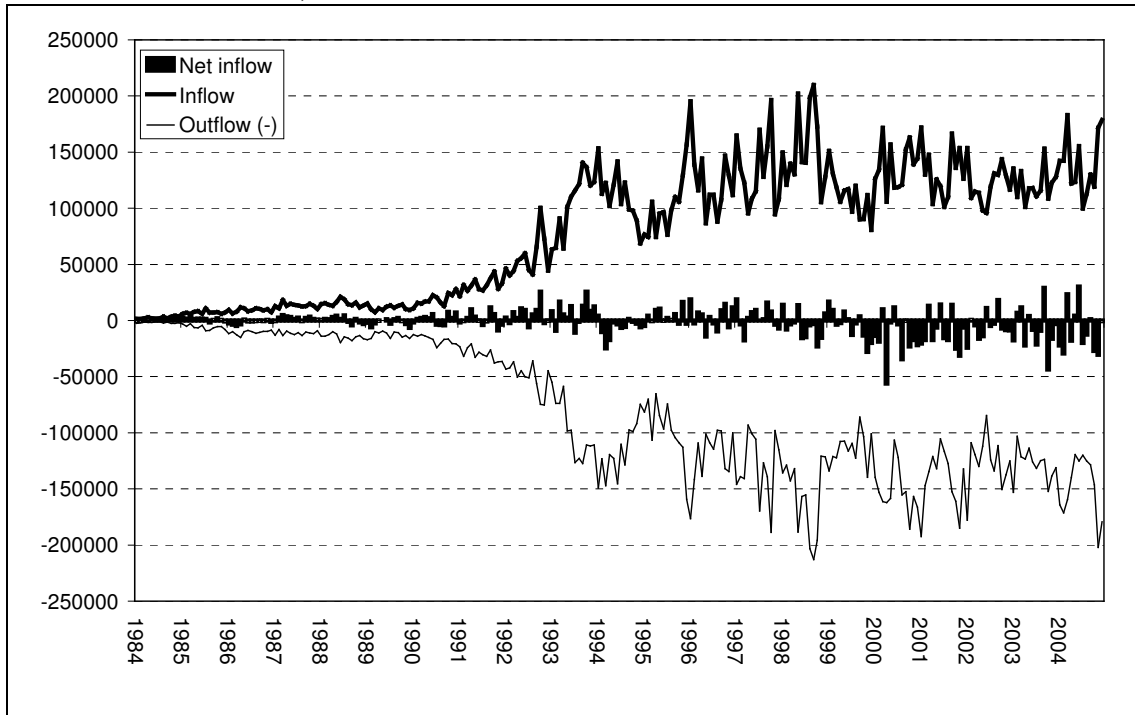
²⁰ In 1999 around 70 large and medium-sized banks.

²¹ The name of such a system is due to the fact that reporting to Danmarks Nationalbank was made every time a trade ticket was completed.

²² In 1999 around 640 firms.

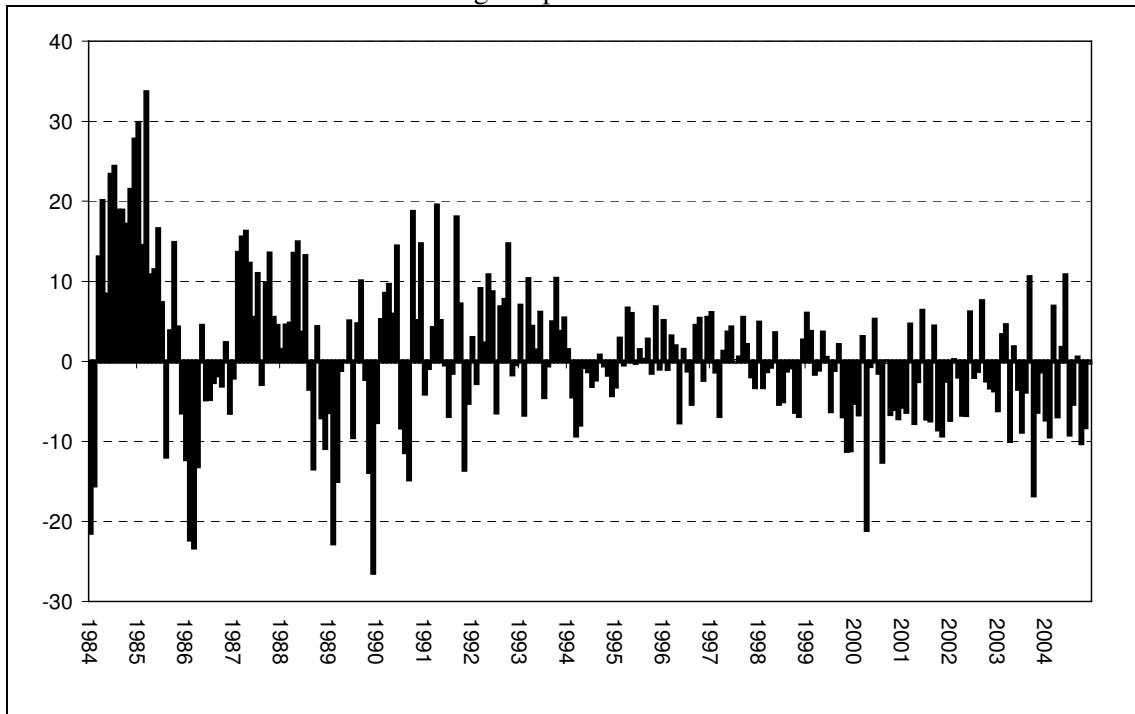
²³ Cf. Danmarks Nationalbank (2005) and Hald (2007).

Figure 2: Capital flows to and from Denmark related to cross-border portfolio investments 1984-2004, million kroner



Sources: See appendix A.

Figure 3: Net capital inflow to Denmark related to portfolio investments 1984-2004, per cent of total cross-border gross portfolio flows



Sources: See appendix A.

Figure 2 shows the gross and net capital flows to and from Denmark related to cross-border portfolio investments 1984-2004. Both gross and net flows have increased markedly during the recent decades. To ensure stationarity all capital flows studied in this paper has therefore been scaled by the total gross portfolio flow (inflow + outflow) in the segment of relevance. Figure 3 shows the results regarding the total net capital flows related to cross-border portfolio investments. *A priori* one should expect that a net inflow of capital lead to a strengthening of the krone. Over the period 1984-2004 the simple contemporaneous correlation coefficient between the total net capital inflow to Denmark from portfolio investments and the monthly change in the exchange rate (DKK per EUR and before 1999: DKK per DEM) is -0.21 .

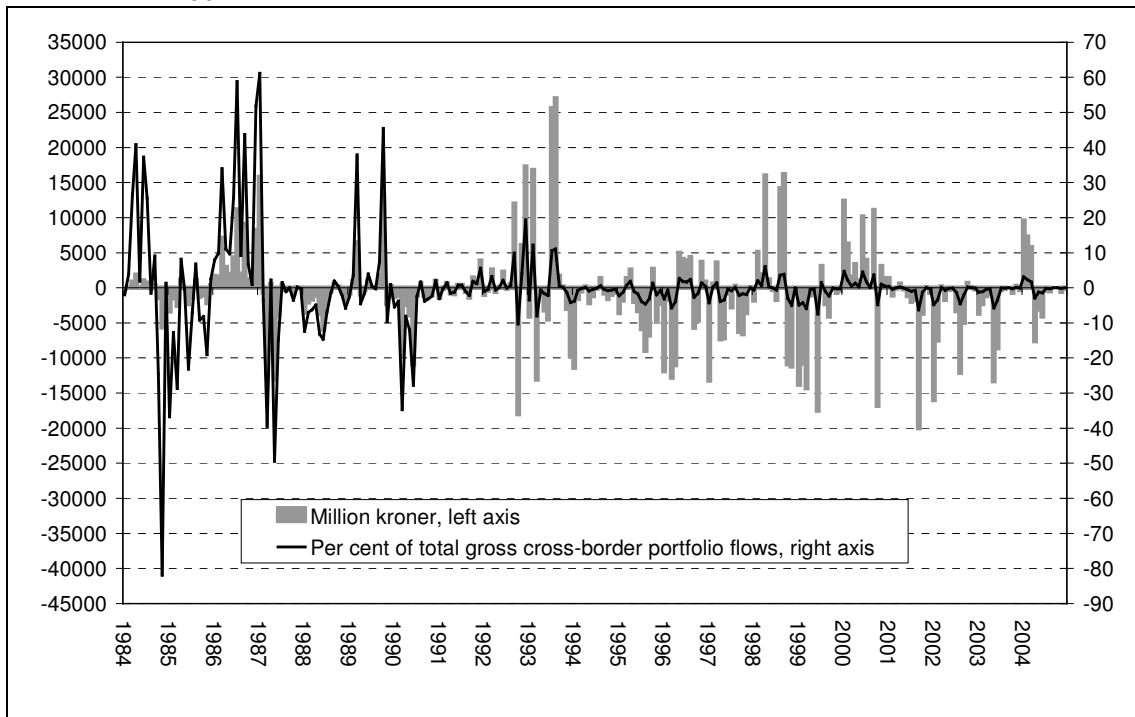
Following the lines within FX microstructure theory the analysis in this paper is based on the assumption that the causality goes from portfolio flows to changes in the krone-euro exchange rate – and not vice versa – so that simultaneity bias can be neglected. This assumption is reasonable at very high data frequencies (e.g. at intraday or daily frequencies) but is naturally debatable for an analysis based on monthly observations. However, due to the credible Danish fixed-exchange-rate policy in the period 1984-2004 – with a unchanged parity vis-à-vis the currency anchor for almost 18 out of the 21 years – it seems also reasonable to assume that portfolio decisions within a month does not depend on contemporaneous changes in the krone-euro rate.

Danmarks Nationalbank's intervention in the krone-foreign-exchange market and changes in the short-term interest-rate spread between Denmark and the currency anchor are two other key variables that must be assumed to affect the short-term movements in the krone-euro exchange rate, cf. figure 4 and 5. The *a priori* expectation is that a central-bank sale of foreign exchange vis-à-vis Danish kroner or an increase in the short-term interest-rate spread²⁴ tends to strengthen the krone. However, Danmarks Nationalbank's interventions in the foreign exchange market and changes in the short-term money-market interest rate spread vis-à-vis the currency anchor can not be seen as exogenous to the changes in krone-euro exchange rate. In a system with pure exchange-rate targeting interventions and changes in the interest-rate spread are used as instruments in the monetary and foreign-exchange-rate policy in order to manage the exchange rate. The three variables are therefore part of a simultaneous system, which has to be taken into account in the empirical analysis.²⁵

²⁴ The short-term money market rate is actually not the monetary policy instrument, but during the whole period since 1984 Danmarks Nationalbank has managed the short-term money market rates via its monetary-policy interest rates and money market operations. Furthermore, by the use of market rates instead of policy rates expectations regarding future monetary-policy actions will be reflected in the data.

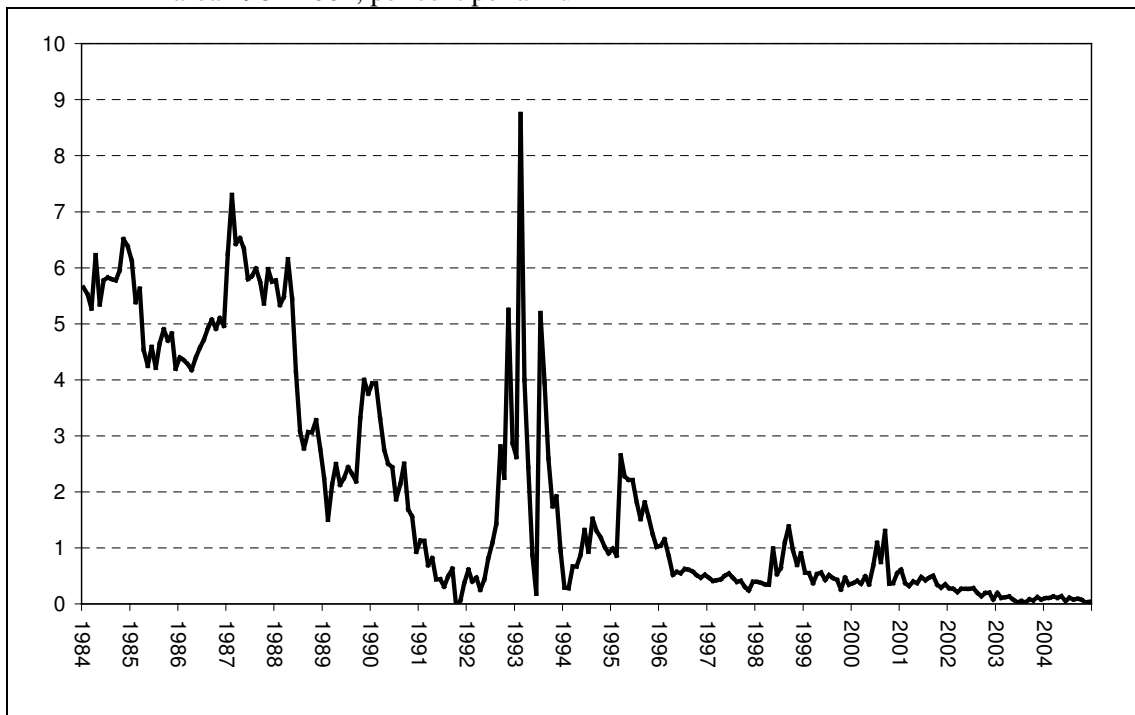
²⁵ Cf. also e.g. Sløk (1995) and Beier & Storgaard (2006)

Figure 4: Danmarks Nationalbank's net sale of foreign exchange vis-à-vis kroner 1984-2004



Sources: See appendix A.

Figure 5: Short-term money market interest-rate spread between Denmark and the euro area 1984-2004, per cent per annum



Note: End of month. Prior to 1999: Short-term interest rate spread vis-à-vis Germany.

Sources: See appendix A.

The empirical analysis in the paper at hand is based on the following variables and mnemonics:

$dSdkkeur_t$	Percentage change in the krone-euro spot exchange rate (DKK per EUR) from end-of-month $t-1$ to end-of-month t . A positive sign denotes a weakening of Danish kroner vis-à-vis the euro.
NPF_t	Total net capital flows related to cross-border portfolio investments in month t measured in per cent of total cross-border gross portfolio flows in month t . A positive sign denotes an inflow of capital to Denmark.
$NPFDS_t$	Non-residents net cross-border portfolio purchase of Danish shares in month t measured in per cent of total cross-border gross portfolio flows in Danish shares in month t . A positive sign denotes an inflow of capital to Denmark.
$NPFDB_t$	Non-residents net cross-border portfolio purchase of Danish bonds <i>etc.</i> in month t measured in per cent of total cross-border gross portfolio flows in Danish bonds <i>etc.</i> in month t . A positive sign denotes an inflow of capital to Denmark.
$NPFFS_t$	Residents net cross-border portfolio sale of foreign shares in month t measured in per cent of total cross-border gross portfolio flows in Foreign shares in month t . A positive sign denotes an inflow of capital to Denmark.
$NPFFB_t$	Residents net cross-border portfolio sale of foreign bonds <i>etc.</i> in month t measured in per cent of total cross-border gross portfolio flows in Foreign bonds <i>etc.</i> in month t . A positive sign denotes an inflow of capital to Denmark.
$CBFX_t$	Danmarks Nationalbank's net sale of foreign exchange vis-à-vis kroner in month t measured in per cent of total cross-border gross portfolio flows in month t . A positive sign denotes that the Nationalbank sells foreign currency and buys Danish kroner.
$d3MIS_t$	Change in the 3-month uncollateralised money market interest-rate spread between Denmark and the euro area from end-of-month $t-1$ to end-of-month t measured in per cent per annum.

For all variables stated above non-stationarity is rejected at a 1 per cent significance level using Augmented Dickey Fuller (ADF) tests, cf. table 1.²⁶ This result is consistent with *a priori* expectations based on conventional economic reasoning. The variables are therefore treated as stationary.

²⁶ All econometric results presented in this paper have been obtained using PcGive.

Table 1 Univariate unit-root tests

	Sample period	
	Full sample 1984-2004	1984-2004 (excluding August 1993)
$dSdkkeur_t$		
Number of lags in ADF test (a)	2	0
ADF test statistics (b)	-11.22**	-13.74**
NPF_t		
Number of lags in ADF test (a)	5	5
ADF test statistics (b)	-3.740**	-3.734**
$NPFDS_t$		
Number of lags in ADF test (a)	3	3
ADF test statistics (b)	-5.059**	-5.043**
$NPFDB_t$		
Number of lags in ADF test (a)	2	2
ADF test statistics (b)	-5.523**	-5.494**
$NPFFS_t$		
Number of lags in ADF test (a)	2	2
ADF test statistics (b)	-5.621**	-5.610**
$NPFFB_t$		
Number of lags in ADF test (a)	2	2
ADF test statistics (b)	-6.400**	-6.435**
$CBFX_t$		
Number of lags in ADF test (a)	4	4
ADF test statistics (b)	-6.378**	-6.342**
$d3MIS_t$		
Number of lags in ADF test (a)	4	4
ADF test statistics (b)	-7.706**	-7.940**

Note: * (**) denotes rejection of the null hypothesis at a 5-per-cent (1-per-cent) significance level.

- (a) The lag length in the ADF tests has been chosen with the aim of ensuring no signs of autocorrelation in the residuals.
(b) The ADF test applied includes a constant but no trend. Null hypothesis is the presence of a unit root (i.e. non-stationarity).

Appendix A details the sources and methods used to construct the data set. All variables are listed in appendix B.

4. Main results

Table 2 shows the baseline regression model where the monthly change in the krone rate is explained by the total net capital flows from portfolio investments. The model is estimated via Ordinary Least Squares (OLS) based on the assumption that the explanatory variable is exogenous, cf. the discussion in section 3.

Table 2: OLS regression of the monthly change in the krone exchange rate (dSdkkeur) explained by total net capital inflow from portfolio investments

	Model I	Model II
	Full sample 1984-2004	Full sample 1984-2004 (excluding August 1993)
Constant term	0.02967	0.004996
Significance probability (a)	0.368	0.853
Net capital inflow (NPF)	-0.01308	-0.01274
Significance probability (a)	0.000	0.000
Coefficient of determination (R^2)	0.04	0.08
Adjusted R^2 (b)	0.04	0.07
F-test (c)	11.64	21.15
Significance probability	0.001	0.000
Number of observations	252	251

Note: Monthly observations.

(a) Null hypothesis: Coefficient equal to zero. The significance probabilities are computed via heteroscedasticity and autocorrelation consistent standard errors.

(b) Adjusted for degrees of freedom.

(c) Null hypothesis: All regression coefficients are zero (excluding the intercept).

The results for the full sample period 1984-2004 (model I) indicate that portfolio flows are significantly related to short-term changes in the krone rate and that the sign of the effect is as expected: A net inflow of capital to Denmark leads to a strengthening of the krone. However, tests for structural breaks indicate that August 1993 – the month where the fluctuation bands in ERM were widened to +/- 15 per cent after a period with severe European currency turmoil – is a serious outlier.²⁷ Excluding August 1993 from the sample (model II in table 2) leaves the estimated exchange-rate effect from the net capital inflow virtually unchanged. The coefficient of determination shows that model II explains around 8 per cent of the monthly changes in the krone rate vis-à-vis the currency anchor. This is comparable in magnitude with findings in similar studies for other countries. However, it also underlines that the short-term fluctuations in the krone rate are influenced by other factors than portfolio flows.

The credibility of the Danish fixed-exchange-rate regime increased gradually during the period 1984-2004, which also has witnessed several cases of currency crises or turmoil within the European exchange-rate co-operation. Furthermore, the period includes the launch of the euro in 1999 and the introduction and spread of electronic trading in the krone-denominated foreign-exchange market. Thus this part of Denmark's recent exchange-rate history includes a number of macroeconomic and microstructure developments with may have influenced the exchange-rate effects from portfolio flows and consequently call for a certain degree of caution when interpreting results from econometric estimations. As part of a general robustness check the baseline model from table 2 has therefore been estimated for three separate sub-periods with the following characteristics:

1984-1988: Almost free cross-border portfolio flows and pure exchange-rate targeting vis-à-vis the D-mark. Two cases of adjustment of the central parity vis-à-vis D-mark.

1989-1998: Totally free cross-border portfolio flows and pure exchange-rate targeting with unchanged parity vis-à-vis the D-mark. Several cases of currency turmoil within the European Exchange-rate Co-operation.

1999-2004: Totally free cross-border portfolio flows and pure exchange-rate targeting with unchanged parity vis-à-vis the euro.

The results are shown in table 3. In all sub-periods net capital flows from portfolio investments are clearly significantly related to short-term changes in the krone rate with the expected sign.

Table 3: OLS regression of the monthly change in the krone exchange rate ($dS_{dkkrur,t}$) explained by total net capital inflow from portfolio investments, various sub-periods

	Model IIIa	Model IIIb	Model IIIc	Memo: Model II
	1984-1988	1989-1998	1999-2004	1984-2004
Constant term	0.2111	-0.05270	-0.01512	0.004996
Significance probability (a)	0.001	0.201	0.049	0.853
Net capital inflow (NPF _t)	-0.01922	-0.01560	-0.004621	-0.01274
Significance probability (a)	0.000	0.019	0.000	0.000
Coefficient of determination (R^2)	0.22	0.06	0.12	0.08
Adjusted R^2 (b)	0.20	0.05	0.11	0.07
F-test (c)	16.13	7.547	9.85	21.15
Significance probability	0.000	0.007	0.002	0.000
Number of observations	60	119	72	251

Notes: Monthly observations. Excluding August 1993.

(a) Null hypothesis: Coefficient equal to zero. The significance probabilities are computed via heteroscedasticity and autocorrelation consistent standard errors.

(b) Adjusted for degrees of freedom.

(c) Null hypothesis: All regression coefficients are zero (excluding the intercept).

Based on the average conditions in the period 1999-2004 the estimated coefficient from model IIIc in table 3 translates into the following absolute effect: A net capital inflow of 10 billion kroner strengthens the krone by 13 pips (e.g. from 744.01 to 743.88 kroner per 100 euro). This effect is similar to the findings (12 pips) in Hansen & Storgaard (2005) based on weekly data in a somewhat different model set-up.²⁸

²⁷ The 1-step Chow F-test for the slope parameter in the regression equation is 177.9 in August 1993 indicating a structural break with a significant probability at 0.0000 (null hypothesis: constant parameter).

²⁸ Hansen & Storgaard, *op.cit.* find that a net capital inflow from portfolio investments of 10 billion kroner strengthens the krone by 12 pips in the period 1999-2004 distributed with an effect of 6 pips in the same week and a further 6 pips in the subsequent week. Their model is estimated on the basis of net capital flows in levels (e.g. the net portfolio flows are not scaled by the total gross portfolio flows). Furthermore, Hansen & Storgaard, *op.cit.* use average weekly data for the exchange rate – not end-of-week data.

The estimated coefficients to the scaled capital flows in table 3 indicate that the relative exchange-rate effect from portfolio flows has declined over time.²⁹ The declining effect on the exchange rate from net portfolio flows over time might be interpreted as a result of an increased credibility of the Danish exchange-rate peg. The market participants have gradually become more convinced that the Danish monetary authorities will ensure a stable krone-euro rate through interventions and interest-rate changes – no matter the size of cross-border capital flows. Anecdotal evidence also indicate that the market participants in recent years have taken positions in expectation of a stable krone-rate, and thereby contributed to stabilising the krone (self-stabilising speculation), cf. page 22 in Danmarks Nationalbank (2003).

Table 4: OLS regression of the monthly change in the krone exchange rate (dS_{dkkEUR_t}) explained by net capital inflow from portfolio by instruments by instrument

	Model IV	Model IVa	Model IVb	Model IVc
	1984-2004	1984-1988	1989-1998	1999-2004
Constant term	0.01573	0.2838	-0.004244	-0.02538
Significance probability (a)	0.679	0.007	0.942	0.102
Net capital inflow, Danish shares (NPFDS _t)	-0.002632	-0.0001462	-0.006346	0.0001756
Significance probability (a)	0.067	0.915	0.038	0.819
Net capital inflow, Danish bonds (NPFDB _t)	-0.009479	-0.01804	-0.01151	-0.001623
Significance probability (a)	0.000	0.000	0.013	0.189
Net capital inflow, foreign shares (NPFFS _t)	-0.0009810	-0.0003684	0.0004910	-0.001426
Significance probability (a)	0.543	0.888	0.839	0.015
Net capital inflow, foreign bonds (NPFDB _t)	-0.001275	-0.001428	-0.0008597	-0.0009546
Significance probability (a)	0.322	0.622	0.606	0.339
Coefficient of determination (R^2)	0.08	0.26	0.09	0.11
Adjusted R^2 (b)	0.07	0.20	0.06	0.06
F-test (c)	5.511	4.751	2.909	2.155
Significance probability	0.000	0.002	0.025	0.084
Number of observations	251	60	119	72

Notes: Monthly observations. Excluding August 1993.

(a) Null hypothesis: Coefficient equal to zero. The significance probabilities are computed via heteroscedasticity and autocorrelation consistent standard errors.

(b) Adjusted for degrees of freedom.

(c) Null hypothesis: All regression coefficients are zero (excluding the intercept).

Table 4 shows the results from a range of regression models where the net capital flows from portfolio investments are broken down by instruments. Net capital inflows from portfolio investments in Danish bonds have had a clearly significant impact on the krone rate with the expected sign prior to 1999. Since then the main driver has been capital flows from portfolio investments in foreign shares.

²⁹ The same conclusion can be reached regarding the absolute exchange-rate effect from portfolio flows. The estimated coefficients in table 3 translate into the following absolute effects: A net capital inflow of 10 billion

5. Robustness to alternative model specifications

Changes in the short-term interest rate spread vis-à-vis the currency anchor and interventions in the krone-denominated foreign-exchange market by Danmarks Nationalbank must *a priori* also be assumed to have an effect on the short-term movements in the krone-euro exchange rate. It is therefore interesting to review the robustness of the main results in section 4 to the inclusion of these two variables in the regression model. However, as mentioned in section 3 changes in the krone rate vis-à-vis the currency anchor, changes in the short-term interest rate spread vis-à-vis the currency anchor and the central bank's interventions are all part of a simultaneous system in a fixed exchange-rate regime which has to be taken into account in the analysis. In the following this is done by Instrumental Variables (IV) regressions³⁰.

Good instruments that are both highly correlated with the relevant endogenous variables for which they serve as instrument and at the same time uncorrelated with the error term in the IV regression are always difficult to find. Lagged values of the central bank's interventions have been used as additional instruments for both the central bank's interventions as well as for the changes in the three-month money market interest-rate spread vis-à-vis the currency anchor. The economic "philosophy" behind this choice of additional instruments is the following:

- Interventions often come in clusters. If there has been a net sale of foreign exchange in the previous months ($CBFX_{t-j} > 0$, $j=1,2,\dots$) the central bank is more likely to make a net sale of foreign exchange vis-à-vis kroner in month t ($CBFX_t > 0$).
- Interventions (first line of defence) normally precede changes in monetary-policy interest rates (second line of defence) within a fixed-exchange-rate system. If there has been a net sale of foreign exchange in the previous months ($CBFX_{t-j} > 0$, $j=1,2,\dots$) the central bank is more likely to (or to be expected to) raise its monetary policy interest rate in month t which will cause an increase the money-market interest-rate spread in month t ($d3MIS_t > 0$).

The IV-estimation results are shown in table 5 whereas table 6 shows the results from the stage one regressions behind the IV-regressions in table 5, i.e. the estimated reduced form for each endogenous explanatory variable. The signs of the estimated parameters in the stage one regressions (cf. Model VIa and VIb in table 6) confirm the *a priori* arguments for the chosen additional instruments. Furthermore, both the Sargan test for independence of the instruments and the error terms as well as the χ^2 test for the significance of all variables indicate that the instruments are valid in all three IV-regressions in table 5.

kroner strengthens the krone vis-à-vis euro by 13 pips in the period 1999-2004, 70 pips in the period 1989-1998 and 762 pips in the period 1984-1988.

³⁰ Or actually Two Stage Least Squares (TSLS) due to the use of a multiplicity of additional instruments, cf. below.

Table 5: IV regression of the monthly change in the krone exchange rate (dS_{dkkr}) explained by total net capital inflow from portfolio investments, 1984-2004

	IV regressions			Memo:
	Endogenous explanatory variable			OLS regression
	CBFX	d3MIS	CBFX d3MIS	No endogenous explanatory variables
	Model Va	Model Vb	Model Vc	Model Vd
Constant term	0.02370	0.02311	0.01935	0.02557
Significance probability (a)	0.396	0.552	0.608	0.281
Net capital inflow (NPF_t)	-0.01674	-0.01702	-0.02100	-0.01148
Significance probability (a)	0.000	0.001	0.001	0.000
Interventions ($CBFX_t$)	-0.01392	...	-0.008332	...
Significance probability (a)	0.021	...	0.367	...
Short-term interest rate spread ($d3MIS_t$)	...	-0.5713	-0.4875	...
Significance probability (a)	...	0.071	0.135	...
Additional instruments	CBFX _{t-1} CBFX _{t-2} CBFX _{t-3}	CBFX _{t-1} CBFX _{t-2} CBFX _{t-3} CBFX _{t-4} CBFX _{t-5}	CBFX _{t-1} CBFX _{t-2} CBFX _{t-3} CBFX _{t-4} CBFX _{t-5} CBFX _{t-6}	...
Sargan test on instrument validity (b)	0.464	2.524	2.095	...
Significance probability	0.793	0.640	0.718	...
Chi ² test (IV)/F-test (OLS) (c)	18.62	10.44	11.83	20.52
Significance probability	0.000	0.005	0.008	0.000
LM (lag 1)	3.256	1.113	0.147	1.482
Significance probability (d)	0.072	0.292	0.702	0.225
LM (lag 1-2)	2.041	1.805	0.917	2.282
Significance probability (d)	0.132	0.167	0.401	0.104
LM (lag 1-3)	1.406	2.148	1.340	1.716
Significance probability (d)	0.242	0.095	0.262	0.164
LM (lag 1-4)	1.997	1.927	1.203	2.665
Significance probability (d)	0.096	0.107	0.310	0.033
LM (lag 1-5)	1.584	1.931	1.686	2.158
Significance probability (d)	0.166	0.090	0.139	0.060
LM (lag 1-6)	1.396	1.860	1.816	1.792
Significance probability (d)	0.217	0.089	0.097	0.101
LM (lag 1-7)	1.393	1.590	1.573	1.840
Significance probability (d)	0.209	0.139	0.144	0.081
Number of observations	242	240	239	245

Notes: Monthly observations. Excluding August 1993-February 1994 due to the six lags of some instruments.

(a) Null hypothesis: Coefficient equal to zero.

(b) Null hypothesis: Instruments are exogenous. The test statistics is calculated as the number of observations times the R^2 from a regression of the IV residuals on all instruments.

(c) Null hypothesis: All regression coefficients are zero (excluding the intercept).

(d) LM test (F-form) for autocorrelation in residuals. Null hypothesis: No autocorrelation.

Table 6: Stage one of the two stages in the IV regressions reported in table 5

	Model VIa	Model VIb	Model VIc	
	Response variable			
	CBFX	d3MIS	CBFX	d3MIS
Constant term	0.1504	0.006374	-0.1126	0.004298
Significance probability (a)	0.843	0.895	0.876	0.930
CBFX _{t-1}	0.2100	0.004959	0.2003	0.005048
Significance probability (a)	0.001	0.229	0.001	0.226
CBFX _{t-2}	0.09525	0.004154	0.07322	0.003498
Significance probability (a)	0.132	0.313	0.244	0.407
CBFX _{t-3}	0.1741	-0.002364	0.1706	-0.002606
Significance probability (a)	0.005	0.562	0.006	0.531
CBFX _{t-4}	...	-0.002463	-0.01472	-0.002390
Significance probability (a)	...	0.547	0.811	0.563
CBFX _{t-5}	...	0.006291	-0.1056	0.006550
Significance probability (a)	...	0.114	0.085	0.113
CBFX _{t-6}	0.09170	-1.19028e-005
Significance probability (a)	0.128	0.998
Net capital inflow (NPF _t)	-0.3670	-0.008749	-0.4644	-0.009496
Significance probability (a)	0.000	0.110	0.000	0.092
Coefficient of determination (R ²)	0.21	0.04	0.25	0.04
Number of observations	242	240	239	239

Notes: Monthly observations. Excluding August 1993-February 1994 due to the six lags of some instruments.

(a) Null hypothesis: Coefficient equal to zero.

The inclusions of changes in the short-term interest rate spread vis-à-vis the currency anchor and central-bank interventions in the krone-denominated foreign-exchange market in the regressions do not materially change the results from section 4. Net capital inflows to Denmark from portfolio investments have a clearly significant impact on the krone rate with the expected sign in all IV-models in table 5. The sizes of the estimated coefficients are also comparable to the analysis in section 4, and the diagnostics indicate no traces of autocorrelation in the residuals.

The sign of the estimated coefficients to interventions and changes in the short-term interest-rate spread in model Va and Vb in table 5 are also as expected: A sale of foreign exchange (corresponding to a purchase of Danish kroner) by the central bank and an increase in the short-term interest-rate spread strengthen the krone. The estimated parameters are significantly different from zero at a 5 or 10 per cent significance level.

When both interventions and changes in the short-term interest-rate spread are included simultaneously (model Vc in table 5) these variables are not significant at a 10 per cent level. However, all the estimated coefficients have the expected sign and the effect from capital flows from portfolio investments on changes in the exchange rate is still highly significant.

It is worth noticing that the estimated magnitude of the krone-rate effect of interventions in table 5 depends on whether changes in the short-term interest rate spread is included in the

regression or not. If changes in the short-term interest-rate spread are included – as in model Vc in table 5 – the effect of interventions decreases markedly compared to model Va. This is in line with *a priori* expectations: If the Nationalbank has intervened in the same direction for some months a change in the short-term monetary-policy interest-rate spread vis-à-vis the currency anchor will usually follow and affect the exchange rate in the same direction as the intervention events. The simple correlation coefficient between interventions and changes in the short-term interest-rate spread is 0.19. This positive correlation indicates that a problem of multicollinearity may – at least to some extent – help to explain why these two variables are not significant different from zero in model Vc in table 5.

Although the estimated coefficient to central bank interventions in model Vc in table 5 is not significant the magnitude of the coefficient is in line with previous findings. In an event study covering the period January 1999 to September 2004 Andersen (2005) finds that an intervention sale of foreign exchange (purchase of Danish kroner) of 10 billion kroner strengthens the krone by 14 pips. Based on the average conditions in the period January 1999 - September 2004 the estimated exchange-rate impact from interventions in model Vc in table 5 implies that an intervention sale of foreign exchange of 10 billion kroner strengthens the krone by 24 pips.

Model Vc in table 5 indicates that an increase in the short-term interest-rate spread vis-à-vis the currency anchor with 1 per cent pro annum (100 basis points) strengthens the krone by 0.49 per cent. The effect is insignificant at a 5-per-cent significance level but the magnitude of this effect is still roughly in line with previous studies. In a SVAR model estimated for the period January 1996 to November 2005 Beier & Storgaard (2006) find that an increase in the short-term interest-rate spread vis-à-vis the currency anchor by 1 per cent pro annum strengthens the krone by around 0.35 per cent.

6. Conclusions and policy implications

The overall findings in the paper support the view that portfolio flows are relevant for short-term exchange-rate determination within the Danish fixed-exchange-rate system and that the sign of the effect is as expected: A net inflow of capital to Denmark leads to a strengthening of the krone. This result is robust to divisions of the data sample into sub-periods and to the inclusion of central-bank interventions and changes in the short-term interest-rate spread as endogenous explanatory variables. Portfolio flows in Danish bonds *etc.* – which mainly consist of krone-denominated fixed-income assets – appear to be driving the results prior to the introduction of the euro. Since then the main driver has been portfolio flows in foreign shares. There appears to have been a tendency towards a declining effect on the krone-euro

rate from net portfolio flows over time which might be a result of a gradually increased credibility of the Danish exchange-rate peg.

The relatively low levels of the coefficients of determination in the estimated regression models seem to indicate that the krone rate in the short-term is also influenced by other factors than contemporaneous portfolio flows. However, statistics on the magnitude and composition of cross-border portfolio flows is still crucial information for a central bank when implementing and communicating interest-rate and intervention strategies for stabilising the exchange rate within a regime of pure exchange rate targeting and no capital account restrictions.

7. References

- Abildgren, K. (2005a), Sterilised and Non-Sterilised Intervention in the Foreign-Exchange Market, *Danmarks Nationalbank Monetary Review*, 1st Quarter, pp. 61-71.
- Abildgren, K. (2005b), Interest-Rate Development in Denmark 1875-2003 – A Survey, *Danish Journal of Economics*, Vol. 143, No. 2, pp. 153-167.
- Abildgren, K. (2005c), Real Effective Exchange Rates and Purchasing-Power-parity Convergence: Empirical Evidence for Denmark, 1875-2002, *Scandinavian Economic History Review*, Vol. 53, No. 3, 2005, pp. 58-70.
- Abildgren, K. (2006a), The Foreign-Exchange Market for Danish Kroner, *Danmarks Nationalbank Monetary Review*, 1st Quarter, pp. 71-85.
- Abildgren, K. (2006b), Estimates of the Danish general government budget balance and the cyclical budget volatility 1875-2005, *Danish Journal of Economics*, Vol. 144, No. 3, pp. 287-303.
- Andersen, A. B. (2005), Exchange-Rate Impact of Danmarks Nationalbank's Interventions in the Foreign-Exchange Market, *Danmarks Nationalbank Monetary Review*, 1st Quarter, pp. 73-86
- Beier, N. C. & Storgaard, P. E. (2006), Identifying monetary policy in a small open economy under fixed exchange rates, *Danmarks Nationalbank Working Paper*, No. 38, June.
- Biltoft-Jensen, K. (1991), Capital Flows and the Liberalization of Foreign-Exchange Restrictions, *Danmarks Nationalbank Monetary Review*, May, 16-21.
- Brooks, R., Edison, H., Kumar, M. S. & Sløk, T. (2004), Exchange Rates and Capital Flows, *European Financial Management*, Vol. 10(3), pp. 511-533.
- Danmarks Nationalbank, Danmarks Nationalbank's website (www.nationalbanken.dk).
- Danmarks Nationalbank, *Financial Statistics*, various issues.
- Danmarks Nationalbank, *Report and Accounts*, various issues.
- Danmarks Nationalbank (2003), *Monetary Policy in Denmark*, Second Edition, Copenhagen: Danmarks Nationalbank.
- Danmarks Nationalbank (2005), Balance of Payments – Financial Account, January 2005, *Danmarks Nationalbank Finansiell statistik NYT*, 28 February.
- Det Økonomiske Råd. Formandskabet (1985), *Dansk pengepolitik under forvandling – En strukturrapport udarbejdet efter anmodning fra folketingets politisk-økonomiske udvalg*, Copenhagen: Akademisk Forlag.
- Evans, M. D. D. & Lyons, R. K. (2006), Understanding Order Flow, *International Journal of Finance and Economics*, Vol. 11(1), pp. 3-23.
- Gereben, Á., Gyomai, G. & Kiss, N. (2005), The microstructure approach to exchange rates: a survey from a central bank's viewpoint, *MNB Occasional Paper*, No. 42.
- Gereben, Á., Gyomai, G. & Kiss, N. (2006), Customer order flow, information and liquidity on the Hungarian foreign exchange market, *MNB Working Paper*, No. 2006/8.

- Hald, J. (2007), *Denmark's balance of payments and international investment position. An overall presentation of the collection and compilation of data*, Copenhagen: Danmarks Nationalbank.
- Hald, J. & Jensen, C. F. (1986), Foreign-Exchange Liberalization and Capital Movements, *Danmarks Nationalbank Monetary Review*, February, pp. 9-18.
- Hansen, J. L. & Storgaard, P. E. (2005), Capital Flows and the Exchange Rate of the Krone, *Danmarks Nationalbank Monetary Review*, 2nd Quarter, pp. 25-41.
- Hau, H. & Rey, H. (2006), Exchange Rate, Equity Prices and Capital Flows, *Review of Financial Studies*, Vol. 19(1), pp. 273-317.
- Hoffmeyer, E. (1993), *Pengepolitiske problemstillinger 1965-1990*, Copenhagen: Danmarks Nationalbank.
- Killeen, W. P., Lyons, R. K. & Moore, M. J. (2006), Fixed versus flexible: Lessons from EMS order flow, *Journal of International Money and Finance*, Vol. 25, pp. 551-579.
- Kolte, L. & Jensen, O. S. (1991), *Det danske valutamarked*, 4th Edition, Copenhagen: Nyt Nordisk Forlag.
- Krabbe, H. S. & Pedersen, L. S. (1998), The Danish Foreign-Exchange Market, *Danmarks Nationalbank Monetary Review*, 1st Quarter, pp. 33-43.
- Lyons, R. K. (2001), *The Microstructure Approach to Exchange Rates*, Cambridge MA.: The MIT Press.
- Jayaswal, P., Kornvig, M. & Skjærbæk, K. (2006), Private Equity Funds, Capital Flows and the Foreign-Exchange Market, *Danmarks Nationalbank Monetary Review*, 3rd Quarter, pp. 81-93.
- Rime, D. (2006), Order flow analysis of exchange rates, *Norges Bank Economic Bulletin*, Vol. 77(3), pp. 147-152
- Sløk, T. (1995), Intervention, valutakurs og renteutvikling under valutauroen, *Nationaløkonomisk Tidsskrift*, Vol. 133(2), pp. 178-188.
- Sarno, L. & Taylor, M. P. (2002), *The economics of exchange rates*, Cambridge: Cambridge University Press.
- Siourounis, G. (2003), *Capital Flows and Exchange Rates: An Empirical Analysis*, mimeo, London Business School.
- Tryde, L. (1999), Danmarks Nationalbank's New Reporting System for Payments Statistics, *Danmarks Nationalbank Monetary Review*, 2nd Quarter, pp. 27-41.

Appendix A: Data sources and calculation methods

Capital flows related to cross-border portfolio investments

Sources:

Various issues of: Danmarks Nationalbank, *Report and Accounts*; and Danmarks Nationalbank, *Financial Statistics*. Other sources: Danmarks Nationalbank's website (www.nationalbanken.dk).

Comments:

(1) Recorded by settlement day. (2) 1984-1998: Excluding capital flows related to cross-border purchase and sale of foreign securities for own account made by Danish banks. Since 1999: Excluding capital flows related to cross-border purchase and sale of foreign securities for own account made by Danish Monetary Financial Institutions (MFIs). (3) 1998: For this year gross portfolio flows in foreign securities are estimated on the basis of monthly net flows in 1998 and gross flows in 1997. (4) In 1998 excluding capital flows related to portfolio investments in Danish bonds denominated in foreign currency. (5) Since December 2002 gross portfolio investments in Danish bonds not issued by the Danish central-government are estimated on the basis of monthly net flows December 2002 to December 2004 and gross flows in December 1991-November 2002.

Bilateral exchange rate and central parity, Danish kroner vis-à-vis the euro

Sources:

Various issues of: Danmarks Nationalbank, *Report and Accounts*. Other sources: Danmarks Nationalbank's website (www.nationalbanken.dk) and internal material at Danmarks Nationalbank.

Comments:

(1) End of month. (2) Recorded by settlement days (T+2). (3) Prior to 1999 a synthetic value for the euro market exchange rate has been calculated on the basis of the Deutsche mark exchange rate vis-à-vis Danish kroner and the irrevocably fixed conversion rate between euro and Deutsche mark on 1 January 1999. (3) Prior to 1999 a synthetic value for the central parity of kroner vis-à-vis the euro has been calculated on the basis of the central parity vis-à-vis the Deutsche mark and the irrevocably fixed conversion rate between euro and Deutsche mark on 1 January 1999. The changes in the central parity during the period since December 1983 (7.10242 kroner per euro) occurred on 7 April 1986 (7.24306 kroner per euro) and 12 January 1987 (7.46038 kroner per euro).

Danmarks Nationalbank's net sale of foreign exchange

Sources:

Various issues of: Danmarks Nationalbank, *Report and Accounts*. Other sources: Danmarks Nationalbank's website (www.nationalbanken.dk).

Comments:

(1) Covers Danmarks Nationalbank's net sale of foreign exchange vis-à-vis Danish kroner. Intervention sales constitute the major part of the figures. However, a minor part of Danmarks Nationalbank's net sale of foreign exchange vis-à-vis Danish kroner is related to its role as banker to the central government, off-market currency transactions in kroner with foreign central banks and the yield on the foreign exchange reserve, cf. Abildgren (2005a). (2) All spot transactions are recorded by settlement day. (3) Danmarks Nationalbank's net sales of foreign exchange vis-à-vis kroner on a forward basis in 1990-1991 are included in the transaction months. Danmarks Nationalbank's net sales of foreign exchange vis-à-vis kroner on a forward basis prior to 1990 are not included. During the period 1992-2004 Danmarks Nationalbank did not intervene in the forward foreign-exchange market, only in the spot market. (4) There is a minor break in the series in January 1991 related to changes in the treatment of transactions by Hypotekbanken (The Mortgage Bank) and Eksportfinansieringsfonden (The Danish Export Finance Corporation).

3-month money market interest rates

Sources:

Danmarks Nationalbank's website (www.nationalbanken.dk), Hoffmeyer (1993) and internal material at Danmarks Nationalbank.

Comments:

(1) End of month. (2) Recorded by settlement days (T+2). (3) 3-month uncollateralised money-market interest rates. (4) The short-term euro area interest rate prior to 1999 covers Germany.

Appendix B: Data

Table B.1: Capital flows related to cross-border portfolio investments in Danish securities 1984-2004, million kroner

Month	Danish shares			Danish bonds etc.			Danish securities, total		
	Inflow	Outflow	Net inflow	Inflow	Outflow	Net inflow	Inflow	Outflow	Net inflow
Jan 1984	117	263	-146	1333	1486	-153	1450	1749	-299
Feb 1984	80	221	-141	1130	1092	38	1210	1313	-103
Mar 1984	160	125	35	1353	899	454	1513	1024	489
Apr 1984	383	91	292	2227	1484	743	2610	1575	1035
May 1984	60	113	-53	1706	1208	498	1766	1321	445
Jun 1984	46	76	-30	1467	651	816	1513	727	786
Jul 1984	36	96	-60	1507	691	816	1543	787	756
Aug 1984	223	248	-25	2643	1432	1211	2866	1680	1186
Sep 1984	83	51	32	1556	859	697	1639	910	729
Oct 1984	117	235	-118	2690	1694	996	2807	1929	878
Nov 1984	74	159	-85	3614	2041	1573	3688	2200	1488
Dec 1984	81	59	22	2809	1349	1460	2890	1408	1482
Jan 1985	113	69	44	5233	2667	2566	5346	2736	2610
Feb 1985	158	115	43	5644	4205	1439	5802	4320	1482
Mar 1985	106	100	6	5236	2260	2976	5342	2360	2982
Apr 1985	165	180	-15	7210	5524	1686	7375	5704	1671
May 1985	71	86	-15	7561	5560	2001	7632	5646	1986
Jun 1985	57	117	-60	4797	3086	1711	4854	3203	1651
Jul 1985	190	239	-49	9689	7563	2126	9879	7802	2077
Aug 1985	230	345	-115	6047	7460	-1413	6277	7805	-1528
Sep 1985	105	214	-109	6064	5433	631	6169	5647	522
Oct 1985	182	300	-118	6332	4012	2320	6514	4312	2202
Nov 1985	197	404	-207	5002	3621	1381	5199	4025	1174
Dec 1985	227	139	88	5747	5574	173	5974	5713	261
Jan 1986	168	210	-42	8026	8507	-481	8194	8717	-523
Feb 1986	163	122	41	5032	7093	-2061	5195	7215	-2020
Mar 1986	207	127	80	6250	8230	-1980	6457	8357	-1900
Apr 1986	195	309	-114	8963	7828	1135	9158	8137	1021
May 1986	223	111	112	7573	4802	2771	7796	4913	2883
Jun 1986	216	134	82	5304	4907	397	5520	5041	479
Jul 1986	185	115	70	5213	5308	-95	5398	5423	-25
Aug 1986	75	117	-42	5591	5457	134	5666	5574	92
Sep 1986	597	161	436	6458	5548	910	7055	5709	1346
Oct 1986	294	189	105	5811	5737	74	6105	5926	179
Nov 1986	302	126	176	6708	6585	123	7010	6711	299
Dec 1986	374	320	54	3766	4673	-907	4140	4993	-853
Jan 1987	905	391	514	7462	8425	-963	8367	8816	-449
Feb 1987	492	226	266	6089	3315	2774	6581	3541	3040
Mar 1987	356	261	95	12135	8336	3799	12491	8597	3894
Apr 1987	117	166	-49	8646	5565	3081	8763	5731	3032
Maj 1987	874	211	663	10207	7763	2444	11081	7974	3107
Jun 1987	610	481	129	9213	8745	468	9823	9226	597
Jul 1987	320	243	77	9420	6872	2548	9740	7115	2625
Aug 1987	728	393	335	7373	8724	-1351	8101	9117	-1016
Sep 1987	1083	643	440	8567	6608	1959	9650	7251	2399
Oct 1987	761	835	-74	9157	7007	2150	9918	7842	2076
Nov 1987	240	503	-263	8613	8459	154	8853	8962	-109
Dec 1987	152	360	-208	7657	6830	827	7809	7190	619
Jan 1988	262	332	-70	11806	11189	617	12068	11521	547
Feb 1988	288	299	-11	11979	10869	1110	12267	11168	1099
Mar 1988	15	198	-183	10800	8721	2079	10815	8919	1896
Apr 1988	179	283	-104	10949	6781	4168	11128	7064	4064
May 1988	117	387	-270	14391	9487	4904	14508	9874	4634
Jun 1988	357	339	18	17996	15468	2528	18353	15807	2546
Jul 1988	600	534	66	15864	11431	4433	16464	11965	4499
Aug 1988	308	386	-78	11540	12333	-793	11848	12719	-871
Sep 1988	321	285	36	10890	15172	-4282	11211	15457	-4246
Oct 1988	374	476	-102	13208	11566	1642	13582	12042	1540
Nov 1988	239	823	-584	9792	10400	-608	10031	11223	-1192
Dec 1988	643	418	225	10426	13553	-3127	11069	13971	-2902
Jan 1989	406	545	-139	12357	14175	-1818	12763	14720	-1957
Feb 1989	510	539	-29	7418	12049	-4631	7928	12588	-4660
Mar 1989	368	438	-70	4977	6677	-1700	5345	7115	-1770
Apr 1989	548	849	-301	7922	7585	337	8470	8434	36

Table B.1 (continued): Capital flows related to cross-border portfolio investments in Danish securities 1984-2004, million kroner

Month	Danish shares			Danish bonds etc.			Danish securities, total		
	Inflow	Outflow	Net inflow	Inflow	Outflow	Net inflow	Inflow	Outflow	Net inflow
May 1989	818	759	59	5565	5916	-351	6383	6675	-292
Jun 1989	991	663	328	8331	6321	2010	9322	6984	2338
Jul 1989	1033	805	228	10178	11394	-1216	11211	12199	-988
Aug 1989	733	763	-30	7249	5795	1454	7982	6558	1424
Sep 1989	811	454	357	8706	5398	3308	9517	5852	3665
Oct 1989	1641	1217	424	8917	8427	490	10558	9644	914
Nov 1989	1087	1277	-190	5893	7000	-1107	6980	8277	-1297
Dec 1989	1502	1141	361	4547	10728	-6181	6049	11869	-5820
Jan 1990	643	589	54	6976	8514	-1538	7619	9103	-1484
Feb 1990	625	523	102	11375	9866	1509	12000	10389	1611
Mar 1990	1885	1093	792	9523	8011	1512	11408	9104	2304
Apr 1990	723	488	235	12340	8800	3540	13063	9288	3775
May 1990	763	1104	-341	13298	10030	3268	14061	11134	2927
Jun 1990	961	2255	-1294	18461	8954	9507	19422	11209	8213
Jul 1990	1300	636	664	14470	15584	-1114	15770	16220	-450
Aug 1990	938	796	142	11747	9225	2522	12685	10021	2664
Sep 1990	372	404	-32	9691	7114	2577	10063	7518	2545
Oct 1990	369	602	-233	12775	9982	2793	13144	10584	2560
Nov 1990	432	312	120	17220	15290	1930	17652	15602	2050
Dec 1990	524	427	97	11467	12832	-1365	11991	13259	-1268
Jan 1991	300	500	-200	16400	16300	100	16700	16800	-100
Feb 1991	600	600	0	24900	23400	1500	25500	24000	1500
Mar 1991	600	500	100	17200	13300	3900	17800	13800	4000
Apr 1991	600	400	200	22600	13400	9200	23200	13800	9400
May 1991	1200	800	400	29200	25000	4200	30400	25800	4600
Jun 1991	1200	700	500	19100	17900	1200	20300	18600	1700
Jul 1991	800	900	-100	18500	17400	1100	19300	18300	1000
Aug 1991	700	1300	-600	24800	22400	2400	25500	23700	1800
Sep 1991	700	700	0	31300	18600	12700	32000	19300	12700
Oct 1991	500	700	-200	37900	27600	10300	38400	28300	10100
Nov 1991	700	700	0	20300	24400	-4100	21000	25100	-4100
Dec 1991	400	500	-100	20200	21800	-1600	20600	22300	-1700
Jan 1992	1200	1300	-100	37600	33100	4500	38800	34400	4400
Feb 1992	600	500	100	30900	29400	1500	31500	29900	1600
Mar 1992	600	700	-100	33700	26300	7400	34300	27000	7300
Apr 1992	700	600	100	44800	39800	5000	45500	40400	5100
May 1992	600	600	0	47500	35100	12400	48100	35700	12400
Jun 1992	700	600	100	48600	40400	8200	49300	41000	8300
Jul 1992	700	400	300	35300	40100	-4800	36000	40500	-4500
Aug 1992	400	400	0	31200	29500	1700	31600	29900	1700
Sep 1992	400	400	0	47700	46200	1500	48100	46600	1500
Okt 1992	400	500	-100	91500	67100	24400	91900	67600	24300
Nov 1992	800	900	-100	63100	68000	-4900	63900	68900	-5000
Dec 1992	1100	900	200	32400	35900	-3500	33500	36800	-3300
Jan 1993	1600	900	700	56500	50000	6500	58100	50900	7200
Feb 1993	2000	900	1100	54700	67300	-12600	56700	68200	-11500
Mar 1993	1100	1000	100	81900	66600	15300	83000	67600	15400
Apr 1993	1500	1000	500	57600	52800	4800	59100	53800	5300
May 1993	1800	1100	700	94300	92300	2000	96100	93400	2700
Jun 1993	1100	1000	100	97800	86200	11600	98900	87200	11700
Jul 1993	800	800	0	108000	116500	-8500	108800	117300	-8500
Aug 1993	2700	1400	1300	110200	113800	-3600	112900	115200	-2300
Sep 1993	1700	1000	700	129100	117300	11800	130800	118300	12500
Oct 1993	2200	1100	1100	121500	96200	25300	123700	97300	26400
Nov 1993	2100	1200	900	108300	101800	6500	110400	103000	7400
Dec 1993	1500	1600	-100	112800	96200	16600	114300	97800	16500
Jan 1994	2400	2400	0	133500	124700	8800	135900	127100	8800
Feb 1994	3000	2200	800	97200	105700	-8500	100200	107900	-7700
Mar 1994	3600	2400	1200	108700	134300	-25600	112300	136700	-24400
Apr 1994	1600	1700	-100	90600	107500	-16900	92200	109200	-17000
May 1994	19500	3300	16200	93300	110200	-16900	112800	113500	-700
Jun 1994	1800	2200	-400	125900	132700	-6800	127700	134900	-7200
Jul 1994	1400	1900	-500	97500	102800	-5300	98900	104700	-5800
Aug 1994	1700	2100	-400	112300	117700	-5400	114000	119800	-5800

Table B.1 (continued): Capital flows related to cross-border portfolio investments in Danish securities 1984-2004, million kroner

Month	Danish shares			Danish bonds etc.			Danish securities, total		
	Inflow	Outflow	Net inflow	Inflow	Outflow	Net inflow	Inflow	Outflow	Net inflow
Sep 1994	1400	1700	-300	87100	88200	-1100	88500	89900	-1400
Oct 1994	1200	1600	-400	86000	86100	-100	87200	87700	-500
Nov 1994	2000	2100	-100	79000	82900	-3900	81000	85000	-4000
Dec 1994	1600	2000	-400	61200	63500	-2300	62800	65500	-2700
Jan 1995	1200	2100	-900	67700	72800	-5100	68900	74900	-6000
Feb 1995	1600	1900	-300	65200	61800	3400	66800	63700	3100
Mar 1995	1500	1800	-300	98000	99500	-1500	99500	101300	-1800
Apr 1995	2500	2200	300	68000	59200	8800	70500	61400	9100
May 1995	3000	1900	1100	88200	78300	9900	91200	80200	11000
Jun 1995	2100	1500	600	84300	85800	-1500	86400	87300	-900
Jul 1995	2000	1700	300	68700	64800	3900	70700	66500	4200
Aug 1995	2600	1600	1000	89100	88800	300	91700	90400	1300
Sep 1995	2300	1800	500	102500	97000	5500	104800	98800	6000
Oct 1995	1600	1900	-300	97300	98600	-1300	98900	100500	-1600
Nov 1995	2700	2100	600	118200	101400	16800	120900	103500	17400
Dec 1995	3000	2400	600	146900	148400	-1500	149900	150800	-900
Jan 1996	3500	2200	1300	177600	162300	15300	181100	164500	16600
Feb 1996	2800	2100	700	130000	134100	-4100	132800	136200	-3400
Mar 1996	2600	3100	-500	104800	97100	7700	107400	100200	7200
Apr 1996	3800	3000	800	131100	127300	3800	134900	130300	4600
May 1996	3900	2700	1200	76200	91300	-15100	80100	94000	-13900
Jun 1996	4300	2500	1800	102800	101000	1800	107100	103500	3600
Jul 1996	3000	2800	200	103000	104600	-1600	106000	107400	-1400
Aug 1996	2600	2400	200	81300	90100	-8800	83900	92500	-8600
Sep 1996	3300	2200	1100	100300	92100	8200	103600	94300	9300
Oct 1996	3400	2500	900	137300	122300	15000	140700	124800	15900
Nov 1996	3300	2000	1300	117600	120000	-2400	120900	122000	-1100
Dec 1996	3200	2600	600	101500	85500	16000	104700	88100	16600
Jan 1997	5600	3300	2300	148600	130700	17900	154200	134000	20200
Feb 1997	5400	3700	1700	121100	125300	-4200	126500	129000	-2500
Mar 1997	4800	3400	1400	109700	128900	-19200	114500	132300	-17800
Apr 1997	3500	3200	300	86000	81700	4300	89500	84900	4600
May 1997	2800	2700	100	97800	89100	8700	100600	91800	8800
Jun 1997	5600	4600	1000	103000	91000	12000	108600	95600	13000
Jul 1997	5800	5000	800	155400	152000	3400	161200	157000	4200
Aug 1997	5100	4500	600	116400	115200	1200	121500	119700	1800
Sep 1997	4500	4100	400	140700	125600	15100	145200	129700	15500
Oct 1997	5600	4500	1100	182700	174800	7900	188300	179300	9000
Nov 1997	3900	3700	200	84300	85300	-1000	88200	89000	-800
Dec 1997	4700	3900	800	95800	97200	-1400	100500	101100	-600
Jan 1998	7600	6700	900	132800	122300	10500	140400	129000	11400
Feb 1998	6100	7100	-1000	109100	111500	-2400	115200	118600	-3400
Mar 1998	9100	8500	600	125500	123400	2100	134600	131900	2700
Apr 1998	9100	8300	800	114800	113900	900	123900	122200	1700
May 1998	11800	11900	-100	183800	167100	16700	195600	179000	16600
Jun 1998	9000	10000	-1000	126000	136900	-10900	135000	146900	-11900
Jul 1998	8000	9600	-1600	127400	134900	-7500	135400	144500	-9100
Aug 1998	7800	10200	-2400	184000	183900	100	191800	194100	-2300
Sep 1998	6600	10200	-3600	196400	193600	2800	203000	203800	-800
Oct 1998	7100	10700	-3600	159700	175300	-15600	166800	186000	-19200
Nov 1998	6800	9900	-3100	91800	101800	-10000	98600	111700	-13100
Dec 1998	7600	8000	-400	115600	102000	13600	123200	110000	13200
Jan 1999	6500	7500	-1000	131241	111544	19697	137741	119044	18697
Feb 1999	6800	7300	-500	111613	97967	13646	118413	105267	13146
Mar 1999	9000	10500	-1500	95891	92434	3457	104891	102934	1957
Apr 1999	6900	8700	-1800	85790	79473	6317	92690	88173	4517
May 1999	8100	7700	400	92730	84788	7942	100830	92488	8342
Jun 1999	8900	7300	1600	93002	88843	4159	101902	96143	5759
Jul 1999	8800	7700	1100	76038	83679	-7641	84838	91379	-6541
Aug 1999	9100	9900	-800	99422	99930	-508	108522	109830	-1308
Sep 1999	6200	6600	-400	66926	59463	7463	73126	66063	7063
Oct 1999	12600	7400	5200	59392	75762	-16370	71992	83162	-11170
Nov 1999	9100	13100	-4000	78568	94416	-15848	87668	107516	-19848
Dec 1999	11600	9900	1700	47042	55730	-8688	58642	65630	-6988

Table B.1 (continued): Capital flows related to cross-border portfolio investments in Danish securities 1984-2004, million kroner

Month	Danish shares			Danish bonds etc.			Danish securities, total		
	Inflow	Outflow	Net inflow	Inflow	Outflow	Net inflow	Inflow	Outflow	Net inflow
Jan 2000	11000	8300	2700	82044	83838	-1794	93044	92138	906
Feb 2000	13800	14000	-200	86897	95817	-8920	100697	109817	-9120
Mar 2000	18700	16200	2500	115167	100882	14285	133867	117082	16785
Apr 2000	15100	24900	-9800	63868	71113	-7245	78968	96013	-17045
May 2000	13300	11200	2100	115622	114090	1532	128922	125290	3632
Jun 2000	15200	9600	5600	77780	67951	9829	92980	77551	15429
Jul 2000	17200	13900	3300	76194	71403	4791	93394	85303	8091
Aug 2000	15900	16100	-200	83731	96425	-12694	99631	112525	-12894
Sep 2000	17300	11300	6000	103618	100834	2784	120918	112134	8784
Oct 2000	19600	16700	2900	110178	117991	-7813	129778	134691	-4913
Nov 2000	19300	16400	2900	84348	93072	-8724	103648	109472	-5824
Dec 2000	17600	16000	1600	79049	86667	-7618	96649	102667	-6018
Jan 2001	17800	14100	3700	98424	108111	-9687	116224	122211	-5987
Feb 2001	14700	14300	400	84959	93155	-8196	99659	107455	-7796
Mar 2001	17500	15500	2000	86529	71741	14788	104029	87241	16788
Apr 2001	10900	12000	-1100	65200	71655	-6455	76100	83655	-7555
May 2001	14400	14600	-200	71611	66208	5403	86011	80808	5203
Jun 2001	14800	13200	1600	70404	57825	12579	85204	71025	14179
Jul 2001	13500	13400	100	56510	60234	-3724	70010	73634	-3624
Aug 2001	13600	14600	-1000	72752	75593	-2841	86352	90193	-3841
Sep 2001	11600	12500	-900	92148	88655	3493	103748	101155	2593
Oct 2001	15600	15100	500	80040	87984	-7944	95640	103084	-7444
Nov 2001	18400	17300	1100	92862	100511	-7649	111262	117811	-6549
Dec 2001	14200	13400	800	62130	59946	2184	76330	73346	2984
Jan 2002	14700	14100	600	97886	108061	-10175	112586	122161	-9575
Feb 2002	14300	12600	1700	59081	55790	3291	73381	68390	4991
Mar 2002	16900	15200	1700	51878	58647	-6769	68778	73847	-5069
Apr 2002	15200	19100	-3900	70571	75493	-4922	85771	94593	-8822
May 2002	18300	16700	1600	51307	62027	-10720	69607	78727	-9120
Jun 2002	12600	12800	-200	49544	41367	8177	62144	54167	7977
Jul 2002	14200	16100	-1900	62567	53222	9345	76767	69322	7445
Aug 2002	13400	13500	-100	80735	75512	5223	94135	89012	5123
Sep 2002	9700	9300	400	74737	63156	11581	84437	72456	11981
Oct 2002	13100	11500	1600	81396	79033	2363	94496	90533	3963
Nov 2002	12800	10700	2100	71145	83194	-12049	83945	93894	-9949
Dec 2002	9600	8500	1100	59805	59839	-34	69405	68339	1066
Jan 2003	8500	7500	1000	84738	84345	393	93238	91845	1393
Feb 2003	8500	9100	-600	59346	49971	9375	67846	59071	8775
Mar 2003	12900	12900	0	70173	57445	12728	83073	70345	12728
Apr 2003	9700	8300	1400	55507	69008	-13501	65207	77308	-12101
May 2003	12000	12000	0	72006	61351	10655	84006	73351	10655
Jun 2003	15800	16000	-200	60193	55096	5097	75993	71096	4897
Jul 2003	10000	11000	-1000	54258	65501	-11243	64258	76501	-12243
Aug 2003	14300	11500	2800	50721	59788	-9067	65021	71288	-6267
Sep 2003	15900	12500	3400	80505	55180	25325	96405	67680	28725
Oct 2003	15300	13600	1700	49499	79145	-29646	64799	92745	-27946
Nov 2003	12400	12900	-500	64843	76224	-11381	77243	89124	-11881
Dec 2003	11600	10500	1100	69204	56975	12229	80804	67475	13329
Jan 2004	13300	13400	-100	72097	76089	-3992	85397	89489	-4092
Feb 2004	13500	14000	-500	75224	89898	-14674	88724	103898	-15174
Mar 2004	17100	19500	-2400	100306	66425	33881	117406	85925	31481
Apr 2004	13800	13400	400	63036	69918	-6882	76836	83318	-6482
May 2004	12200	14200	-2000	70325	67271	3054	82525	81471	1054
Jun 2004	35800	23200	12600	76032	57868	18164	111832	81068	30764
Jul 2004	13700	13000	700	58580	63661	-5081	72280	76661	-4381
Aug 2004	12200	12700	-500	60936	66910	-5974	73136	79610	-6474
Sep 2004	14900	14300	600	65626	58411	7215	80526	72711	7815
Oct 2004	17300	16500	800	59509	80648	-21139	76809	97148	-20339
Nov 2004	19700	18800	900	88694	97162	-8468	108394	115962	-7568
Dec 2004	16900	18000	-1100	91422	66827	24595	108322	84827	23495

Table B.2: Capital flows related to cross-border portfolio investments in foreign securities 1984-2004, million kroner

Month	Foreign shares			Foreign bonds etc.			Foreign securities, total		
	Inflow	Outflow	Net inflow	Inflow	Outflow	Net inflow	Inflow	Outflow	Net inflow
Jan 1984	30	522	-492	164	268	-104	194	790	-596
Feb 1984	86	336	-250	203	399	-196	289	735	-446
Mar 1984	143	254	-111	243	185	58	386	439	-53
Apr 1984	59	122	-63	109	154	-45	168	276	-108
May 1984	98	196	-98	206	235	-29	304	431	-127
Jun 1984	115	147	-32	120	213	-93	235	360	-125
Jul 1984	156	180	-24	112	136	-24	268	316	-48
Aug 1984	231	303	-72	261	311	-50	492	614	-122
Sep 1984	231	397	-166	214	117	97	445	514	-69
Oct 1984	384	400	-16	273	125	148	657	525	132
Nov 1984	310	330	-20	194	183	11	504	513	-9
Dec 1984	264	220	44	404	386	18	668	606	62
Jan 1985	350	357	-7	265	131	134	615	488	127
Feb 1985	484	444	40	439	267	172	923	711	212
Mar 1985	377	469	-92	188	106	82	565	575	-10
Apr 1985	217	244	-27	108	261	-153	325	505	-180
May 1985	381	511	-130	186	366	-180	567	877	-310
Jun 1985	546	707	-161	469	297	172	1015	1004	11
Jul 1985	548	785	-237	291	681	-390	839	1466	-627
Aug 1985	379	441	-62	411	727	-316	790	1168	-378
Sep 1985	571	758	-187	488	302	186	1059	1060	-1
Oct 1985	552	838	-286	377	377	0	929	1215	-286
Nov 1985	531	1180	-649	303	338	-35	834	1518	-684
Dec 1985	551	1665	-1114	490	589	-99	1041	2254	-1213
Jan 1986	800	2660	-1860	326	535	-209	1126	3195	-2069
Feb 1986	755	1891	-1136	428	919	-491	1183	2810	-1627
Mar 1986	1147	3109	-1962	441	1451	-1010	1588	4560	-2972
Apr 1986	1810	4369	-2559	719	2702	-1983	2529	7071	-4542
May 1986	1704	3378	-1674	1264	1561	-297	2968	4939	-1971
Jun 1986	1853	2686	-833	738	1191	-453	2591	3877	-1286
Jul 1986	2562	2947	-385	1087	1566	-479	3649	4513	-864
Aug 1986	2855	3118	-263	2233	2632	-399	5088	5750	-662
Sep 1986	1816	2815	-999	1405	2119	-714	3221	4934	-1713
Oct 1986	1889	2246	-357	1007	1382	-375	2896	3628	-732
Nov 1986	1962	1612	350	1170	1369	-199	3132	2981	151
Dec 1986	2223	2049	174	1109	1455	-346	3332	3504	-172
Jan 1987	2439	2438	1	1840	1914	-74	4279	4352	-73
Feb 1987	2507	3138	-631	1589	1454	135	4096	4592	-496
Mar 1987	3608	3537	71	2260	1310	950	5868	4847	1021
Apr 1987	2522	2206	316	1889	1568	321	4411	3774	637
Maj 1987	2411	2474	-63	1308	1139	169	3719	3613	106
Jun 1987	2806	2169	637	1340	1138	202	4146	3307	839
Jul 1987	2511	2660	-149	1224	1052	172	3735	3712	23
Aug 1987	3005	3040	-35	1460	1133	327	4465	4173	292
Sep 1987	2063	2602	-539	951	571	380	3014	3173	-159
Oct 1987	3596	2655	941	1261	773	488	4857	3428	1429
Nov 1987	2893	1347	1546	1423	1510	-87	4316	2857	1459
Dec 1987	1639	1336	303	751	806	-55	2390	2142	248
Jan 1988	1318	1618	-300	1149	980	169	2467	2598	-131
Feb 1988	1713	1564	149	1469	1397	72	3182	2961	221
Mar 1988	2090	2517	-427	984	1203	-219	3074	3720	-646
Apr 1988	1220	1356	-136	629	1479	-850	1849	2835	-986
May 1988	1260	1193	67	530	1013	-483	1790	2206	-416
Jun 1988	1836	2372	-536	809	1360	-551	2645	3732	-1087
Jul 1988	1654	1557	97	701	931	-230	2355	2488	-133
Aug 1988	1486	1734	-248	1140	1042	98	2626	2776	-150
Sep 1988	1294	1245	49	1176	1210	-34	2470	2455	15
Oct 1988	870	901	-31	1390	1597	-207	2260	2498	-238
Nov 1988	805	1133	-328	713	921	-208	1518	2054	-536
Dec 1988	983	1217	-234	1186	1261	-75	2169	2478	-309
Jan 1989	993	1373	-380	1320	1026	294	2313	2399	-86
Feb 1989	1109	1947	-838	922	1278	-356	2031	3225	-1194
Mar 1989	1145	1386	-241	811	1361	-550	1956	2747	-791
Apr 1989	1196	1444	-248	1188	1205	-17	2384	2649	-265

Table B.2 (continued): Capital flows related to cross-border portfolio investments in foreign securities 1984-2004, million kroner

Month	Foreign shares			Foreign bonds etc.			Foreign securities, total		
	Inflow	Outflow	Net inflow	Inflow	Outflow	Net inflow	Inflow	Outflow	Net inflow
May 1989	1240	1381	-141	1849	1420	429	3089	2801	288
Jun 1989	1156	1813	-657	1934	2431	-497	3090	4244	-1154
Jul 1989	1164	1521	-357	923	2353	-1430	2087	3874	-1787
Aug 1989	1272	1481	-209	2105	2312	-207	3377	3793	-416
Sep 1989	1741	1636	105	1894	3279	-1385	3635	4915	-1280
Oct 1989	1550	2084	-534	2138	3142	-1004	3688	5226	-1538
Nov 1989	1343	1281	62	1909	3950	-2041	3252	5231	-1979
Dec 1989	1336	1489	-153	1947	2665	-718	3283	4154	-871
Jan 1990	892	1585	-693	2287	1880	407	3179	3465	-286
Feb 1990	1421	1359	62	2315	2448	-133	3736	3807	-71
Mar 1990	1768	1648	120	1835	1925	-90	3603	3573	30
Apr 1990	914	1334	-420	2726	3171	-445	3640	4505	-865
May 1990	1263	1292	-29	1880	2880	-1000	3143	4172	-1029
Jun 1990	1365	2199	-834	1606	3372	-1766	2971	5571	-2600
Jul 1990	1556	1983	-427	3060	5852	-2792	4616	7835	-3219
Aug 1990	1450	1480	-30	1978	8727	-6749	3428	10207	-6779
Sep 1990	1072	1039	33	1454	8376	-6922	2526	9415	-6889
Oct 1990	1124	1341	-217	10187	4842	5345	11311	6183	5128
Nov 1990	1004	1048	-44	3829	3685	144	4833	4733	100
Dec 1990	1428	1061	367	14409	6411	7998	15837	7472	8365
Jan 1991	800	1100	-300	4100	5500	-1400	4900	6600	-1700
Feb 1991	1100	1900	-800	5000	6200	-1200	6100	8100	-2000
Mar 1991	1600	2000	-400	7000	8500	-1500	8600	10500	-1900
Apr 1991	1400	1400	0	6400	5700	700	7800	7100	700
May 1991	1100	1400	-300	4900	5700	-800	6000	7100	-1100
Jun 1991	1600	1600	0	6100	8000	-1900	7700	9600	-1900
Jul 1991	1300	1800	-500	6100	10500	-4400	7400	12300	-4900
Aug 1991	1500	2400	-900	4200	6000	-1800	5700	8400	-2700
Sep 1991	1000	1500	-500	4700	5400	-700	5700	6900	-1200
Oct 1991	1500	1500	0	3800	8100	-4300	5300	9600	-4300
Nov 1991	1300	1300	0	5800	10500	-4700	7100	11800	-4700
Dec 1991	1700	2100	-400	10700	12200	-1500	12400	14300	-1900
Jan 1992	1100	1600	-500	6100	7400	-1300	7200	9000	-1800
Feb 1992	1400	2000	-600	7200	10400	-3200	8600	12400	-3800
Mar 1992	1500	1800	-300	8400	8100	300	9900	9900	0
Apr 1992	1000	1300	-300	6400	8900	-2500	7400	10200	-2800
May 1992	1500	1600	-100	6000	7500	-1500	7500	9100	-1600
Jun 1992	1200	1100	100	9200	8100	1100	10400	9200	1200
Jul 1992	900	1700	-800	8000	8800	-800	8900	10500	-1600
Aug 1992	1000	1400	-400	8500	4600	3900	9500	6000	3500
Sep 1992	1400	1400	0	16000	8200	7800	17400	9600	7800
Okt 1992	1400	1500	-100	6900	5500	1400	8300	7000	1300
Nov 1992	1300	1300	0	7700	5100	2600	9000	6400	2600
Dec 1992	1000	1900	-900	10000	6100	3900	11000	8000	3000
Jan 1993	1100	1300	-200	4000	2800	1200	5100	4100	1000
Feb 1993	1600	1600	0	6400	4100	2300	8000	5700	2300
Mar 1993	1800	1700	100	5900	4500	1400	7700	6200	1500
Apr 1993	1400	1300	100	3400	3500	-100	4800	4800	0
May 1993	1400	1300	100	3600	3700	-100	5000	5000	0
Jun 1993	1800	1900	-100	9600	8600	1000	11400	10500	900
Jul 1993	1500	1700	-200	5400	7500	-2100	6900	9200	-2300
Aug 1993	1700	1800	-100	7100	5900	1200	8800	7700	1100
Sep 1993	2100	2200	-100	7500	6800	700	9600	9000	600
Oct 1993	2200	2200	0	10500	11400	-900	12700	13600	-900
Nov 1993	1800	2300	-500	8000	6400	1600	9800	8700	1100
Dec 1993	2500	2800	-300	6600	10300	-3700	9100	13100	-4000
Jan 1994	2400	3500	-1100	15100	18600	-3500	17500	22100	-4600
Feb 1994	2200	3700	-1500	10500	11600	-1100	12700	15300	-2600
Mar 1994	1800	2600	-800	8300	8000	300	10100	10600	-500
Apr 1994	1600	1800	-200	8100	8400	-300	9700	10200	-500
May 1994	1700	1700	0	6600	7600	-1000	8300	9300	-1000
Jun 1994	1200	1800	-600	12900	8600	4300	14100	10400	3700
Jul 1994	900	1300	-400	4100	4400	-300	5000	5700	-700
Aug 1994	1300	1200	100	7600	7600	0	8900	8800	100

Table B.2 (continued): Capital flows related to cross-border portfolio investments in foreign securities 1984-2004, million kroner

Month	Foreign shares			Foreign bonds etc.			Foreign securities, total		
	Inflow	Outflow	Net inflow	Inflow	Outflow	Net inflow	Inflow	Outflow	Net inflow
Sep 1994	1500	1600	-100	8900	6000	2900	10400	7600	2800
Oct 1994	1000	1600	-600	9700	9600	100	10700	11200	-500
Nov 1994	1700	1500	200	6200	5400	800	7900	6900	1000
Dec 1994	1200	1600	-400	4700	7600	-2900	5900	9200	-3300
Jan 1995	1400	1900	-500	6300	4800	1500	7700	6700	1000
Feb 1995	1300	1400	-100	6200	5100	1100	7500	6500	1000
Mar 1995	1700	1500	200	4500	3700	800	6200	5200	1000
Apr 1995	1300	1300	0	2700	2600	100	4000	3900	100
May 1995	1500	1800	-300	2500	2600	-100	4000	4400	-400
Jun 1995	2800	2300	500	7300	7200	100	10100	9500	600
Jul 1995	2000	2600	-600	3700	5200	-1500	5700	7800	-2100
Aug 1995	1600	3100	-1500	4800	4200	600	6400	7300	-900
Sep 1995	1900	2100	-200	3400	3400	0	5300	5500	-200
Oct 1995	2300	1800	500	4600	6500	-1900	6900	8300	-1400
Nov 1995	1800	2100	-300	6600	7300	-700	8400	9400	-1000
Dec 1995	1900	2200	-300	4800	6400	-1600	6700	8600	-1900
Jan 1996	2500	3100	-600	11500	8800	2700	14000	11900	2100
Feb 1996	2200	2300	-100	3900	3000	900	6100	5300	800
Mar 1996	2100	2500	-400	6600	6400	200	8700	8900	-200
Apr 1996	1800	2500	-700	7400	6000	1400	9200	8500	700
May 1996	2200	2600	-400	4500	4500	0	6700	7100	-400
Jun 1996	1700	1900	-200	3300	3500	-200	5000	5400	-400
Jul 1996	2200	3100	-900	3900	4200	-300	6100	7300	-1200
Aug 1996	1300	2300	-1000	2800	3000	-200	4100	5300	-1200
Sep 1996	1800	2100	-300	2100	2000	100	3900	4100	-200
Oct 1996	2400	3300	-900	3600	3800	-200	6000	7100	-1100
Nov 1996	1900	3000	-1100	5800	9600	-3800	7700	12600	-4900
Dec 1996	2700	3300	-600	4100	8600	-4500	6800	11900	-5100
Jan 1997	3400	4900	-1500	7100	7100	0	10500	12000	-1500
Feb 1997	3700	5300	-1600	5300	4700	600	9000	10000	-1000
Mar 1997	3800	4800	-1000	4600	3700	900	8400	8500	-100
Apr 1997	3100	4500	-1400	2800	3800	-1000	5900	8300	-2400
May 1997	2700	4300	-1600	5200	4900	300	7900	9200	-1300
Jun 1997	3700	6900	-3200	2800	3300	-500	6500	10200	-3700
Jul 1997	4800	8100	-3300	3800	4600	-800	8600	12700	-4100
Aug 1997	4000	4700	-700	2500	2400	100	6500	7100	-600
Sep 1997	6600	5500	1100	3300	4000	-700	9900	9500	400
Oct 1997	4000	5300	-1300	4200	4100	100	8200	9400	-1200
Nov 1997	4200	5400	-1200	2100	3700	-1600	6300	9100	-2800
Dec 1997	4300	6800	-2500	3200	7300	-4100	7500	14100	-6600
Jan 1998	3375	4675	-1300	5758	2058	3700	9133	6733	2400
Feb 1998	2525	5525	-3000	3108	4708	-1600	5633	10233	-4600
Mar 1998	1975	6075	-4100	2908	4908	-2000	4883	10983	-6100
Apr 1998	2375	5675	-3300	3858	3958	-100	6233	9633	-3400
May 1998	3225	4825	-1600	3258	4558	-1300	6483	9383	-2900
Jun 1998	2725	5325	-2600	3308	4508	-1200	6033	9833	-3800
Jul 1998	1525	6525	-5000	3608	4208	-600	5133	10733	-5600
Aug 1998	3575	4475	-900	3258	4558	-1300	6833	9033	-2200
Sep 1998	4175	3875	300	2608	5208	-2600	6783	9083	-2300
Oct 1998	2775	5275	-2500	3208	4608	-1400	5983	9883	-3900
Nov 1998	2575	5475	-2900	4208	3608	600	6783	9083	-2300
Dec 1998	2175	5875	-3700	2358	5458	-3100	4533	11333	-6800
Jan 1999	6594	8995	-2401	6638	6009	629	13232	15004	-1772
Feb 1999	5406	7237	-1831	6700	8727	-2027	12106	15964	-3858
Mar 1999	7188	10747	-3559	6566	8706	-2140	13754	19453	-5699
Apr 1999	6483	9619	-3136	6506	10035	-3529	12989	19654	-6665
May 1999	7081	8631	-1550	7639	6480	1159	14720	15111	-391
Jun 1999	6783	10351	-3568	8605	9810	-1205	15388	20161	-4773
Jul 1999	6844	11034	-4190	4997	7108	-2111	11841	18142	-6301
Aug 1999	6146	6872	-726	5224	5758	-534	11370	12630	-1260
Sep 1999	8242	10367	-2125	8522	9871	-1349	16764	20238	-3474
Oct 1999	12010	14443	-2433	6325	5973	352	18335	20416	-2081
Nov 1999	13396	20993	-7597	10545	11154	-609	23941	32147	-8206
Dec 1999	14808	23037	-8229	7300	12250	-4950	22108	35287	-13179

Table B.2 (continued): Capital flows related to cross-border portfolio investments in foreign securities 1984-2004, million kroner

Month	Foreign shares			Foreign bonds etc.			Foreign securities, total		
	Inflow	Outflow	Net inflow	Inflow	Outflow	Net inflow	Inflow	Outflow	Net inflow
Jan 2000	16745	27521	-10776	16370	20217	-3847	33115	47738	-14623
Feb 2000	21443	24727	-3284	12177	18729	-6552	33620	43456	-9836
Mar 2000	24488	26212	-1724	13035	17996	-4961	37523	44208	-6685
Apr 2000	15916	51384	-35468	10830	14622	-3792	26746	66006	-39260
May 2000	14390	19234	-4844	13304	13906	-602	27694	33140	-5446
Jun 2000	11993	16242	-4249	13336	12820	516	25329	29062	-3733
Jul 2000	17665	22372	-4707	7606	14440	-6834	25271	36812	-11541
Aug 2000	14027	30688	-16661	7057	12100	-5043	21084	42788	-21704
Sep 2000	18870	21832	-2962	12578	18636	-6058	31448	40468	-9020
Oct 2000	18545	27445	-8900	14735	23882	-9147	33280	51327	-18047
Nov 2000	17167	27509	-10342	18376	19774	-1398	35543	47283	-11740
Dec 2000	22305	29210	-6905	25237	34319	-9082	47542	63529	-15987
Jan 2001	34622	44540	-9918	21012	25679	-4667	55634	70219	-14585
Feb 2001	16425	22829	-6404	13681	16948	-3267	30106	39777	-9671
Mar 2001	26045	28892	-2847	17394	18403	-1009	43439	47295	-3856
Apr 2001	13720	22600	-8880	13994	14899	-905	27714	37499	-9785
May 2001	18066	28019	-9953	21594	23141	-1547	39660	51160	-11500
Jun 2001	16265	16815	-550	18104	17555	549	34369	34370	-1
Jul 2001	14656	20680	-6024	16557	22466	-5909	31213	43146	-11933
Aug 2001	9793	19331	-9538	13826	17986	-4160	23619	37317	-13698
Sep 2001	42093	21903	20190	20345	29292	-8947	62438	51195	11243
Oct 2001	18023	15942	2081	22055	41873	-19818	40078	57815	-17737
Nov 2001	14791	14716	75	27538	52456	-24918	42329	67172	-24843
Dec 2001	23215	25451	-2236	26503	33547	-7044	49718	58998	-9280
Jan 2002	17743	27076	-9333	23428	28683	-5255	41171	55759	-14588
Feb 2002	16141	19635	-3494	19705	20841	-1136	35846	40476	-4630
Mar 2002	19246	25403	-6157	26905	20093	6812	46151	45496	655
Apr 2002	12113	15539	-3426	15859	19847	-3988	27972	35386	-7414
May 2002	10845	15230	-4385	17598	18146	-548	28443	33376	-4933
Jun 2002	16640	13769	2871	16802	16660	142	33442	30429	3013
Jul 2002	17984	19298	-1314	24631	35494	-10863	42615	54792	-12177
Aug 2002	18179	12570	5609	18648	32423	-13775	36827	44993	-8166
Sep 2002	17022	14742	2280	28238	24355	3883	45260	39097	6163
Oct 2002	24663	15340	9323	24448	44708	-20260	49111	60048	-10937
Nov 2002	19739	11763	7976	25150	31789	-6639	44889	43552	1337
Dec 2002	21046	15042	6004	25887	41707	-15820	46933	56749	-9816
Jan 2003	11654	11555	99	30502	49593	-19091	42156	61148	-18992
Feb 2003	11508	9285	2223	30737	34800	-4063	42245	44085	-1840
Mar 2003	16012	11012	5000	33913	40155	-6242	49925	51167	-1242
Apr 2003	10442	8254	2188	25548	37983	-12435	35990	46237	-10247
May 2003	7288	9206	-1918	26416	31120	-4704	33704	40326	-6622
Jun 2003	10518	11102	-584	31312	43947	-12635	41830	55049	-13219
Jul 2003	8999	11117	-2118	37226	44178	-6952	46225	55295	-9070
Aug 2003	7335	12698	-5363	43430	40878	2552	50765	53576	-2811
Sep 2003	12031	16440	-4409	44420	39633	4787	56451	56073	378
Oct 2003	13069	15489	-2420	30719	43925	-13206	43788	59414	-15626
Nov 2003	9466	11964	-2498	35622	37618	-1996	45088	49582	-4494
Dec 2003	12385	21598	-9213	34758	42083	-7325	47143	63681	-16538
Jan 2004	12161	17947	-5786	44542	56851	-12309	56703	74798	-18095
Feb 2004	12261	16772	-4511	41012	50735	-9723	53273	67507	-14234
Mar 2004	14419	19534	-5115	51008	54086	-3078	65427	73620	-8193
Apr 2004	16467	18922	-2455	28732	37714	-8982	45199	56636	-11437
May 2004	10702	11223	-521	30155	26623	3532	40857	37846	3011
Jun 2004	13727	16919	-3192	29675	27181	2494	43402	44100	-698
Jul 2004	11144	12152	-1008	16359	31090	-14731	27503	43242	-15739
Aug 2004	10798	11977	-1179	28839	33750	-4911	39637	45727	-6090
Sep 2004	14161	15097	-936	35250	40894	-5644	49411	55991	-6580
Oct 2004	16961	18252	-1291	25372	30803	-5431	42333	49055	-6722
Nov 2004	22160	25044	-2884	40923	61101	-20178	63083	86145	-23062
Dec 2004	19953	32721	-12768	50339	61582	-11243	70292	94303	-24011

Table B.3: Danmarks Nationalbank's net sale of foreign exchange vis-à-vis kroner 1984-2004

Month	Million kroner	Month	Million kroner	Month	Million kroner	Month	Million kroner
Jan 1984	-82	May 1989	-309	Sep 1994	-800	Jan 2000	12400
Feb 1984	137	Jun 1989	942	Oct 1994	-1600	Feb 2000	6300
Mar 1984	891	Jul 1989	104	Nov 1994	-1000	Mar 2000	1600
Apr 1984	1889	Aug 1989	-42	Dec 1994	-700	Apr 2000	3400
May 1984	73	Sep 1989	1776	Jan 1995	-3600	May 2000	1000
Jun 1984	1057	Oct 1989	13234	Feb 1995	-1800	Jun 2000	10200
Jul 1984	746	Nov 1989	-2299	Mar 1995	1400	Jul 2000	4000
Aug 1984	-89	Dec 1989	252	Apr 1995	2600	Aug 2000	200
Sep 1984	318	Jan 1990	-1279	May 1995	-2000	Sep 2000	11100
Oct 1984	-1451	Feb 1990	-1130	Jun 1995	-3300	Oct 2000	-16800
Nov 1984	-5654	Mar 1990	-9619	Jul 1995	-5900	Nov 2000	3100
Dec 1984	75	Apr 1990	-2455	Aug 1995	-9000	Dec 2000	1400
Jan 1985	-3371	May 1990	-3918	Sep 1995	-6800	Jan 2001	1400
Feb 1985	-1496	Jun 1990	-10908	Oct 1995	2700	Feb 2001	-1100
Mar 1985	-2540	Jul 1990	-1076	Nov 1995	-4800	Mar 2001	-100
Apr 1985	1134	Aug 1990	595	Dec 1995	-2300	Apr 2001	600
May 1985	-63	Sep 1990	-1121	Jan 1996	-11900	May 2001	-200
Jun 1985	-2334	Oct 1990	-1311	Feb 1996	-1700	Jun 2001	-1200
Jul 1985	-1420	Nov 1990	-998	Mar 1996	-12800	Jul 2001	-2000
Aug 1985	1084	Dec 1990	993	Apr 1996	-11000	Aug 2001	-1700
Sep 1985	-1278	Jan 1991	-1400	May 1996	5000	Sep 2001	-20000
Oct 1985	-1068	Feb 1991	-100	Jun 1996	4100	Oct 2001	-3700
Nov 1985	-2198	Mar 1991	700	Jul 1996	3900	Nov 2001	100
Dec 1985	375	Apr 1991	-800	Aug 1996	4400	Dec 2001	-700
Jan 1986	1691	May 1991	-900	Sep 1996	-5700	Jan 2002	-16000
Feb 1986	1626	Jun 1991	400	Oct 1996	-4700	Feb 2002	-7500
Mar 1986	7117	Jul 1991	400	Nov 1996	3700	Mar 2002	200
Apr 1986	2985	Aug 1991	-600	Dec 1996	900	Apr 2002	-1700
May 1986	1993	Sep 1991	-1400	Jan 1997	-13200	May 2002	-300
Jun 1986	4370	Oct 1991	1500	Feb 1997	600	Jun 2002	-200
Jul 1986	11166	Nov 1991	800	Mar 1997	3600	Jul 2002	-3300
Aug 1986	2037	Dec 1991	3900	Apr 1997	-7300	Aug 2002	-12100
Sep 1986	9142	Jan 1992	-1000	May 1997	-7200	Sep 2002	-5000
Oct 1986	1234	Feb 1992	-400	Jun 1997	-800	Oct 2002	700
Nov 1986	179	Mar 1992	2600	Jul 1997	-2800	Nov 2002	100
Dec 1986	8280	Apr 1992	-600	Aug 1997	300	Dec 2002	-200
Jan 1987	15777	May 1992	100	Sep 1997	-6300	Jan 2003	-3700
Feb 1987	-686	Jun 1992	2300	Oct 1997	-6600	Feb 2003	-2300
Mar 1987	-12554	Jul 1992	-100	Nov 1997	-3600	Mar 2003	-1200
Apr 1987	502	Aug 1992	500	Dec 1997	100	Apr 2003	-800
Maj 1987	-13031	Sep 1992	12000	Jan 1998	-1800	May 2003	-13300
Jun 1987	-3931	Okt 1992	-18000	Feb 1998	5100	Jun 2003	-8600
Jul 1987	363	Nov 1992	6100	Mar 1998	1900	Jul 2003	-300
Aug 1987	-279	Dec 1992	17300	Apr 1998	16000	Aug 2003	-100
Sep 1987	14	Jan 1993	-4100	May 1998	1200	Sep 2003	0
Oct 1987	-922	Feb 1993	16800	Jun 1998	-300	Oct 2003	-700
Nov 1987	55	Mar 1993	-13100	Jul 1998	-1700	Nov 2003	300
Dec 1987	-28	Apr 1993	-800	Aug 1998	14200	Dec 2003	-300
Jan 1988	-3551	May 1993	-3200	Sep 1998	16200	Jan 2004	9600
Feb 1988	-2073	Jun 1993	-4500	Oct 1998	-10900	Feb 2004	7300
Mar 1988	-1667	Jul 1993	25600	Nov 1998	-11200	Mar 2004	5800
Apr 1988	-1113	Aug 1993	27000	Dec 1998	-300	Apr 2004	-7600
May 1988	-3757	Sep 1993	1700	Jan 1999	-13800	May 2004	-3100
Jun 1988	-5951	Oct 1993	200	Feb 1999	-10800	Jun 2004	-4100
Jul 1988	-2303	Nov 1993	-3000	Mar 1999	-14300	Jul 2004	-400
Aug 1988	-464	Dec 1993	-9700	Apr 1999	-1100	Aug 2004	-500
Sep 1988	595	Jan 1994	-11400	May 1999	-700	Sep 2004	0
Oct 1988	138	Feb 1994	-1600	Jun 1999	-17500	Oct 2004	0
Nov 1988	-539	Mar 1994	-500	Jul 1999	3100	Nov 2004	-600
Dec 1988	-1737	Apr 1994	200	Aug 1999	-2300	Dec 2004	-100
Jan 1989	-806	May 1994	-2200	Sep 1999	-4100		
Feb 1989	920	Jun 1994	-1200	Oct 1999	-100		
Mar 1989	6495	Jul 1994	-100	Nov 1999	-700		
Apr 1989	-991	Aug 1994	1400	Dec 1999	-400		

Table B.4: Bilateral krone exchange rate vis-à-vis the euro, Danish kroner per euro, 1983-2004

Month	Market rate	Month	Market rate	Month	Market rate	Month	Market rate
Dec 1983	7.0897	Apr 1989	7.6100	Aug 1994	7.7483	Dec 1999	7.4413
Jan 1984	7.0906	May 1989	7.6170	Sep 1994	7.6822	Jan 2000	7.4431
Feb 1984	7.1773	Jun 1989	7.6126	Oct 1994	7.6439	Feb 2000	7.4476
Mar 1984	7.1730	Jul 1989	7.6039	Nov 1994	7.6597	Mar 2000	7.4465
Apr 1984	7.1880	Aug 1989	7.6025	Dec 1994	7.6743	Apr 2000	7.4550
May 1984	7.1780	Sep 1989	7.6110	Jan 1995	7.7223	May 2000	7.4598
Jun 1984	7.1670	Oct 1989	7.6190	Feb 1995	7.7415	Jun 2000	7.4580
Jul 1984	7.1474	Nov 1989	7.5954	Mar 1995	7.8188	Jul 2000	7.4562
Aug 1984	7.1093	Dec 1989	7.6083	Apr 1995	7.6780	Aug 2000	7.4566
Sep 1984	7.0772	Jan 1990	7.5677	May 1995	7.6401	Sep 2000	7.4653
Oct 1984	7.0599	Feb 1990	7.5141	Jun 1995	7.6399	Oct 2000	7.4435
Nov 1984	7.0390	Mar 1990	7.4478	Jul 1995	7.6128	Nov 2000	7.4592
Dec 1984	7.0043	Apr 1990	7.4431	Aug 1995	7.5891	Dec 2000	7.4659
Jan 1985	6.9789	May 1990	7.4517	Sep 1995	7.5922	Jan 2001	7.4621
Feb 1985	7.0143	Jun 1990	7.4430	Oct 1995	7.6047	Feb 2001	7.4649
Mar 1985	6.9970	Jul 1990	7.4476	Nov 1995	7.5678	Mar 2001	7.4634
Apr 1985	7.0457	Aug 1990	7.4803	Dec 1995	7.5721	Apr 2001	7.4638
May 1985	7.0310	Sep 1990	7.4655	Jan 1996	7.5708	May 2001	7.4575
Jun 1985	7.0164	Oct 1990	7.4628	Feb 1996	7.5615	Jun 2001	7.4478
Jul 1985	7.0287	Nov 1990	7.5051	Mar 1996	7.5522	Jul 2001	7.4453
Aug 1985	7.1177	Dec 1990	7.5468	Apr 1996	7.5404	Aug 2001	7.4441
Sep 1985	7.1203	Jan 1991	7.5219	May 1996	7.5554	Sep 2001	7.4361
Oct 1985	7.0940	Feb 1991	7.5138	Jun 1996	7.5330	Oct 2001	7.4376
Nov 1985	7.0749	Mar 1991	7.5014	Jul 1996	7.5515	Nov 2001	7.4407
Dec 1985	7.1239	Apr 1991	7.4719	Aug 1996	7.5617	Dec 2001	7.4383
Jan 1986	7.2153	May 1991	7.5065	Sep 1996	7.5177	Jan 2002	7.4282
Feb 1986	7.2133	Jun 1991	7.5627	Oct 1996	7.5136	Feb 2002	7.4316
Mar 1986	7.2257	Jul 1991	7.5635	Nov 1996	7.5074	Mar 2002	7.4335
Apr 1986	7.2448	Aug 1991	7.5428	Dec 1996	7.4818	Apr 2002	7.4339
May 1986	7.2330	Sep 1991	7.5503	Jan 1997	7.4635	May 2002	7.4365
Jun 1986	7.2556	Oct 1991	7.5830	Feb 1997	7.4668	Jun 2002	7.4304
Jul 1986	7.3622	Nov 1991	7.6076	Mar 1997	7.4570	Jul 2002	7.4328
Aug 1986	7.3957	Dec 1991	7.6221	Apr 1997	7.4460	Aug 2002	7.4253
Sep 1986	7.3768	Jan 1992	7.5849	May 1997	7.4502	Sep 2002	7.4276
Oct 1986	7.3597	Feb 1992	7.5813	Jun 1997	7.4516	Oct 2002	7.4321
Nov 1986	7.3879	Mar 1992	7.5897	Jul 1997	7.4477	Nov 2002	7.4263
Dec 1986	7.4073	Apr 1992	7.5623	Aug 1997	7.4490	Dec 2002	7.4267
Jan 1987	7.4147	May 1992	7.5545	Sep 1997	7.4468	Jan 2003	7.4346
Feb 1987	7.3691	Jun 1992	7.5094	Oct 1997	7.4462	Feb 2003	7.4280
Mar 1987	7.3689	Jul 1992	7.5261	Nov 1997	7.4479	Mar 2003	7.4263
Apr 1987	7.3684	Aug 1992	7.5681	Dec 1997	7.4522	Apr 2003	7.4245
Maj 1987	7.3583	Sep 1992	7.5403	Jan 1998	7.4511	May 2003	7.4243
Jun 1987	7.3917	Okt 1992	7.5194	Feb 1998	7.4553	Jun 2003	7.4257
Jul 1987	7.4225	Nov 1992	7.5706	Mar 1998	7.4559	Jul 2003	7.4313
Aug 1987	7.5268	Dec 1992	7.5370	Apr 1998	7.4619	Aug 2003	7.4307
Sep 1987	7.5169	Jan 1993	7.5355	May 1998	7.4488	Sep 2003	7.4271
Oct 1987	7.5083	Feb 1993	7.5154	Jun 1998	7.4493	Oct 2003	7.4319
Nov 1987	7.5396	Mar 1993	7.5229	Jul 1998	7.4550	Nov 2003	7.4392
Dec 1987	7.5399	Apr 1993	7.5327	Aug 1998	7.4492	Dec 2003	7.4437
Jan 1988	7.5005	May 1993	7.4862	Sep 1998	7.4367	Jan 2004	7.4485
Feb 1988	7.4673	Jun 1993	7.5099	Oct 1998	7.4364	Feb 2004	7.4515
Mar 1988	7.4974	Jul 1993	7.6034	Nov 1998	7.4375	Mar 2004	7.4450
Apr 1988	7.5254	Aug 1993	8.0726	Dec 1998	7.4472	Apr 2004	7.4405
May 1988	7.4421	Sep 1993	7.9374	Jan 1999	7.4358	May 2004	7.4396
Jun 1988	7.4245	Oct 1993	7.8752	Feb 1999	7.4345	Jun 2004	7.4321
Jul 1988	7.4236	Nov 1993	7.7517	Mar 1999	7.4319	Jul 2004	7.4349
Aug 1988	7.5169	Dec 1993	7.6414	Apr 1999	7.4350	Aug 2004	7.4369
Sep 1988	7.4945	Jan 1994	7.6037	May 1999	7.4321	Sep 2004	7.4400
Oct 1988	7.5455	Feb 1994	7.6396	Jun 1999	7.4327	Oct 2004	7.4348
Nov 1988	7.5415	Mar 1994	7.7062	Jul 1999	7.4443	Nov 2004	7.4290
Dec 1988	7.5545	Apr 1994	7.6989	Aug 1999	7.4335	Dec 2004	7.4409
Jan 1989	7.5936	May 1994	7.6553	Sep 1999	7.4323		
Feb 1989	7.6268	Jun 1994	7.6766	Oct 1999	7.4336		
Mar 1989	7.6236	Jul 1994	7.6852	Nov 1999	7.4385		

Table B.5: 3-month money market interest rate, Denmark, percent per annum, 1983-2004

Month	Interest rate	Month	Interest rate	Month	Interest rate	Month	Interest rate
Dec 1983	12.25	Apr 1989	8.94	Aug 1994	6.40	Dec 1999	3.60
Jan 1984	11.75	May 1989	9.38	Sep 1994	6.25	Jan 2000	3.60
Feb 1984	11.38	Jun 1989	9.13	Oct 1994	6.25	Feb 2000	3.95
Mar 1984	11.13	Jul 1989	9.25	Nov 1994	6.04	Mar 2000	4.15
Apr 1984	12.13	Aug 1989	9.31	Dec 1994	6.15	Apr 2000	4.45
May 1984	11.50	Sep 1989	9.88	Jan 1995	5.90	May 2000	4.69
Jun 1984	11.88	Oct 1989	11.38	Feb 1995	5.80	Jun 2000	5.15
Jul 1984	11.88	Nov 1989	12.00	Mar 1995	7.53	Jul 2000	5.70
Aug 1984	11.75	Dec 1989	12.06	Apr 1995	6.78	Aug 2000	5.62
Sep 1984	11.63	Jan 1990	12.06	May 1995	6.60	Sep 2000	6.15
Oct 1984	12.00	Feb 1990	12.31	Jun 1995	6.70	Oct 2000	5.44
Nov 1984	12.31	Mar 1990	11.38	Jul 1995	6.25	Nov 2000	5.33
Dec 1984	12.19	Apr 1990	10.94	Aug 1995	5.70	Dec 2000	5.33
Jan 1985	12.13	May 1990	10.56	Sep 1995	5.75	Jan 2001	5.30
Feb 1985	11.44	Jun 1990	10.50	Oct 1995	5.55	Feb 2001	5.15
Mar 1985	11.88	Jul 1990	10.00	Nov 1995	5.05	Mar 2001	4.78
Apr 1985	10.44	Aug 1990	10.44	Dec 1995	4.80	Apr 2001	5.15
May 1985	10.00	Sep 1990	10.81	Jan 1996	4.35	May 2001	4.86
Jun 1985	10.19	Oct 1990	10.13	Feb 1996	4.40	Jun 2001	4.86
Jul 1985	9.31	Nov 1990	10.44	Mar 1996	4.10	Jul 2001	4.84
Aug 1985	9.25	Dec 1990	10.31	Apr 1996	3.68	Aug 2001	4.69
Sep 1985	9.50	Jan 1991	10.19	May 1996	3.78	Sep 2001	4.03
Oct 1985	9.75	Feb 1991	10.06	Jun 1996	3.83	Oct 2001	3.82
Nov 1985	9.63	Mar 1991	9.75	Jul 1996	3.82	Nov 2001	3.56
Dec 1985	9.00	Apr 1991	9.88	Aug 1996	3.70	Dec 2001	3.58
Jan 1986	9.00	May 1991	9.38	Sep 1996	3.62	Jan 2002	3.60
Feb 1986	8.75	Jun 1991	9.38	Oct 1996	3.57	Feb 2002	3.55
Mar 1986	8.88	Jul 1991	9.44	Nov 1996	3.60	Mar 2002	3.60
Apr 1986	8.63	Aug 1991	9.63	Dec 1996	3.58	Apr 2002	3.61
May 1986	9.00	Sep 1991	9.69	Jan 1997	3.55	May 2002	3.69
Jun 1986	9.13	Oct 1991	9.25	Feb 1997	3.56	Jun 2002	3.65
Jul 1986	9.31	Nov 1991	9.38	Mar 1997	3.63	Jul 2002	3.57
Aug 1986	9.38	Dec 1991	10.06	Apr 1997	3.57	Aug 2002	3.51
Sep 1986	9.63	Jan 1992	10.05	May 1997	3.59	Sep 2002	3.39
Oct 1986	9.56	Feb 1992	9.90	Jun 1997	3.56	Oct 2002	3.39
Nov 1986	9.75	Mar 1992	10.10	Jul 1997	3.58	Nov 2002	3.18
Dec 1986	9.81	Apr 1992	10.00	Aug 1997	3.61	Dec 2002	3.00
Jan 1987	10.50	May 1992	10.00	Sep 1997	3.64	Jan 2003	2.92
Feb 1987	11.25	Jun 1992	10.50	Oct 1997	3.90	Feb 2003	2.63
Mar 1987	10.38	Jul 1992	10.78	Nov 1997	3.92	Mar 2003	2.63
Apr 1987	10.38	Aug 1992	11.24	Dec 1997	3.93	Apr 2003	2.61
Maj 1987	10.00	Sep 1992	11.50	Jan 1998	3.84	May 2003	2.37
Jun 1987	9.50	Okt 1992	11.00	Feb 1998	3.81	Jun 2003	2.11
Jul 1987	10.00	Nov 1992	14.00	Mar 1998	3.81	Jul 2003	2.12
Aug 1987	9.94	Dec 1992	11.50	Apr 1998	3.90	Aug 2003	2.14
Sep 1987	9.75	Jan 1993	11.00	May 1998	4.50	Sep 2003	2.13
Oct 1987	10.06	Feb 1993	17.00	Jun 1998	4.02	Oct 2003	2.16
Nov 1987	9.88	Mar 1993	11.88	Jul 1998	4.09	Nov 2003	2.19
Dec 1987	9.50	Apr 1993	10.00	Aug 1998	4.50	Dec 2003	2.17
Jan 1988	9.13	May 1993	8.25	Sep 1998	4.77	Jan 2004	2.13
Feb 1988	8.69	Jun 1993	7.68	Oct 1998	4.45	Feb 2004	2.13
Mar 1988	8.88	Jul 1993	12.00	Nov 1998	4.25	Mar 2004	2.03
Apr 1988	9.50	Aug 1993	10.50	Dec 1998	4.03	Apr 2004	2.12
May 1988	9.00	Sep 1993	9.15	Jan 1999	3.50	May 2004	2.15
Jun 1988	8.44	Oct 1993	8.05	Feb 1999	3.49	Jun 2004	2.12
Jul 1988	8.13	Nov 1993	8.05	Mar 1999	3.25	Jul 2004	2.17
Aug 1988	8.13	Dec 1993	6.75	Apr 1999	2.97	Aug 2004	2.14
Sep 1988	7.97	Jan 1994	6.10	May 1999	3.04	Sep 2004	2.15
Oct 1988	8.06	Feb 1994	6.09	Jun 1999	3.00	Oct 2004	2.16
Nov 1988	8.13	Mar 1994	6.23	Jul 1999	3.10	Nov 2004	2.15
Dec 1988	8.06	Apr 1994	5.98	Aug 1999	3.08	Dec 2004	2.17
Jan 1989	8.06	May 1994	5.93	Sep 1999	3.07		
Feb 1989	8.31	Jun 1994	6.20	Oct 1999	3.69		
Mar 1989	8.44	Jul 1994	5.86	Nov 1999	3.83		

Table B.6: 3-month money market interest rate, Euro area, percent per annum, 1983-2004

Month	Interest rate	Month	Interest rate	Month	Interest rate	Month	Interest rate
Dec 1983	6.50	Apr 1989	6.44	Aug 1994	4.88	Dec 1999	3.26
Jan 1984	6.10	May 1989	7.25	Sep 1994	4.94	Jan 2000	3.23
Feb 1984	5.85	Jun 1989	6.88	Oct 1994	5.06	Feb 2000	3.54
Mar 1984	5.85	Jul 1989	6.81	Nov 1994	5.02	Mar 2000	3.79
Apr 1984	5.90	Aug 1989	7.00	Dec 1994	5.25	Apr 2000	3.96
May 1984	6.15	Sep 1989	7.69	Jan 1995	4.91	May 2000	4.34
Jun 1984	6.10	Oct 1989	8.06	Feb 1995	4.94	Jun 2000	4.47
Jul 1984	6.05	Nov 1989	8.00	Mar 1995	4.88	Jul 2000	4.61
Aug 1984	5.95	Dec 1989	8.31	Apr 1995	4.50	Aug 2000	4.87
Sep 1984	5.85	Jan 1990	8.13	May 1995	4.38	Sep 2000	4.85
Oct 1984	6.05	Feb 1990	8.38	Jun 1995	4.49	Oct 2000	5.08
Nov 1984	5.80	Mar 1990	8.06	Jul 1995	4.44	Nov 2000	4.96
Dec 1984	5.80	Apr 1990	8.19	Aug 1995	4.19	Dec 2000	4.78
Jan 1985	6.00	May 1990	8.06	Sep 1995	3.94	Jan 2001	4.69
Feb 1985	6.05	Jun 1990	8.06	Oct 1995	4.00	Feb 2001	4.78
Mar 1985	6.25	Jul 1990	8.13	Nov 1995	3.81	Mar 2001	4.46
Apr 1985	5.90	Aug 1990	8.31	Dec 1995	3.78	Apr 2001	4.75
May 1985	5.75	Sep 1990	8.31	Jan 1996	3.31	May 2001	4.49
Jun 1985	5.60	Oct 1990	8.44	Feb 1996	3.25	Jun 2001	4.38
Jul 1985	5.10	Nov 1990	8.88	Mar 1996	3.25	Jul 2001	4.42
Aug 1985	4.60	Dec 1990	9.38	Apr 1996	3.16	Aug 2001	4.22
Sep 1985	4.60	Jan 1991	9.06	May 1996	3.21	Sep 2001	3.53
Oct 1985	5.05	Feb 1991	8.94	Jun 1996	3.28	Oct 2001	3.48
Nov 1985	4.80	Mar 1991	9.06	Jul 1996	3.20	Nov 2001	3.27
Dec 1985	4.80	Apr 1991	9.06	Aug 1996	3.09	Dec 2001	3.23
Jan 1986	4.60	May 1991	8.94	Sep 1996	3.04	Jan 2002	3.32
Feb 1986	4.40	Jun 1991	8.94	Oct 1996	3.06	Feb 2002	3.28
Mar 1986	4.60	Jul 1991	9.13	Nov 1996	3.13	Mar 2002	3.39
Apr 1986	4.45	Aug 1991	9.13	Dec 1996	3.06	Apr 2002	3.34
May 1986	4.60	Sep 1991	9.06	Jan 1997	3.08	May 2002	3.42
Jun 1986	4.55	Oct 1991	9.31	Feb 1997	3.15	Jun 2002	3.38
Jul 1986	4.60	Nov 1991	9.31	Mar 1997	3.21	Jul 2002	3.29
Aug 1986	4.45	Dec 1991	9.69	Apr 1997	3.13	Aug 2002	3.31
Sep 1986	4.55	Jan 1992	9.44	May 1997	3.09	Sep 2002	3.25
Oct 1986	4.65	Feb 1992	9.50	Jun 1997	3.02	Oct 2002	3.20
Nov 1986	4.65	Mar 1992	9.63	Jul 1997	3.11	Nov 2002	2.98
Dec 1986	4.85	Apr 1992	9.75	Aug 1997	3.22	Dec 2002	2.92
Jan 1987	4.25	May 1992	9.56	Sep 1997	3.23	Jan 2003	2.73
Feb 1987	3.95	Jun 1992	9.69	Oct 1997	3.60	Feb 2003	2.52
Mar 1987	3.95	Jul 1992	9.69	Nov 1997	3.68	Mar 2003	2.51
Apr 1987	3.85	Aug 1992	9.81	Dec 1997	3.54	Apr 2003	2.48
May 1987	3.65	Sep 1992	8.69	Jan 1998	3.45	May 2003	2.30
Jun 1987	3.70	Oct 1992	8.75	Feb 1998	3.43	Jun 2003	2.08
Jul 1987	4.15	Nov 1992	8.75	Mar 1998	3.46	Jul 2003	2.07
Aug 1987	3.95	Dec 1992	8.63	Apr 1998	3.56	Aug 2003	2.11
Sep 1987	4.00	Jan 1993	8.38	May 1998	3.51	Sep 2003	2.05
Oct 1987	4.70	Feb 1993	8.25	Jun 1998	3.49	Oct 2003	2.10
Nov 1987	3.90	Mar 1993	7.88	Jul 1998	3.45	Nov 2003	2.07
Dec 1987	3.75	Apr 1993	7.56	Aug 1998	3.39	Dec 2003	2.09
Jan 1988	3.35	May 1993	7.38	Sep 1998	3.39	Jan 2004	2.03
Feb 1988	3.35	Jun 1993	7.50	Oct 1998	3.49	Feb 2004	2.02
Mar 1988	3.40	Jul 1993	6.81	Nov 1998	3.55	Mar 2004	1.90
Apr 1988	3.35	Aug 1993	6.56	Dec 1998	3.13	Apr 2004	2.01
May 1988	3.55	Sep 1993	6.56	Jan 1999	2.94	May 2004	2.01
Jun 1988	4.30	Oct 1993	6.31	Feb 1999	2.94	Jun 2004	2.07
Jul 1988	5.05	Nov 1993	6.13	Mar 1999	2.88	Jul 2004	2.06
Aug 1988	5.35	Dec 1993	5.81	Apr 1999	2.44	Aug 2004	2.06
Sep 1988	4.90	Jan 1994	5.81	May 1999	2.48	Sep 2004	2.06
Oct 1988	5.00	Feb 1994	5.81	Jun 1999	2.57	Oct 2004	2.09
Nov 1988	4.85	Mar 1994	5.56	Jul 1999	2.59	Nov 2004	2.12
Dec 1988	5.30	Apr 1994	5.31	Aug 1999	2.62	Dec 2004	2.13
Jan 1989	5.81	May 1994	5.06	Sep 1999	2.64		
Feb 1989	6.81	Jun 1994	4.88	Oct 1999	3.43		
Mar 1989	6.31	Jul 1994	4.93	Nov 1999	3.36		