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BUSINESS CYCLES, MONETARY TRANSMISSION AND SHOCKS TO FINANCIAL STABILITY

EMPIRICAL EVIDENCE FROM A NEW SET OF DANISH QUARTERLY NATIONAL ACCOUNTS 1948-2010

Kim Abildgren

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The research is carried out in three work streams:
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The paper is released in order to make the research of MaRs generally available, in preliminary form, to encourage comments and suggestions prior to final publication. The views expressed in the paper are the ones of the author(s) and do not necessarily reflect those of the ECB or of the ESCB.

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Abstract

In Denmark official quarterly national accounts are only available for the period since 1977. The paper constructs a set of summary non-seasonally adjusted quarterly national accounts for Denmark for 1948-2010 in current and constant prices as well as a set of other key quarterly macroeconomic indicators covering the Danish economy since 1948. As a first exploratory analysis of these two new data sets the paper reviews some of the stylised empirical evidence on the business cycle, the monetary transmission mechanism and shocks to financial stability that can be uncovered using filtering techniques and reduced-form vector autoregressive (VAR) models. The long-span data sets make it possible to estimate VAR models of a higher dimension than is usually found in the literature due to degrees-of-freedom problems. The results from the VAR analysis indicate a significant and long-lasting negative impact on real GDP following an exogenous shock to the banking sector's write-down ratio.

Key words: Quarterly national accounts; Danish economic history; business cycles; monetary transmission; financial stability; band-pass filters; VAR analysis.
JEL Classification: C32; C82; E01; E32; E44; E52; N14.

Resumé (Danish summary)

I Danmark foreligger kun officielle kvartalsvise nationalregnskaber for perioden siden 1977. I papiret konstrueres et sæt summariske ikke-sæsonkorrigerede kvartalsvise nationalregnskaber for Danmark i såvel løbende som faste priser for perioden 1948-2010. Endvidere konstrueres et supplerende datasæt, som indeholder en række øvrige kvartalsvise makroøkonomiske indikatorer for den danske økonomi dækkende samme periode. Som en første eksplorativ analyse af disse to nye datasæt gennemgås de empiriske stiliserede fakta omkring konjunkturcykler, den pengepolitiske transmissionsmekanisme og finansiel stabilitet, som kan udledes på basis af filtreringsteknikker og vektorautoregressive (VAR) modeller. De nye lange tidsserier gør det muligt at estimere VAR modeller af en højere dimension, end der normalt ses i litteraturen som følge af problemer med manglende frihedsgrader. VAR analyserne indikerer, at der kan være en signifikant og langvarig negativ påvirkning af det reale bruttonationalprodukt efter et eksogent stød til bankernes nedskrivningsprocenter.

Non-technical summary

In Denmark official time series of quarterly national accounts are only available for the period since 1977. Based on a range of quarterly business cycle indicators this paper constructs a set of summary non-seasonally adjusted quarterly national accounts for Denmark 1948-2010 in current and constant prices as well as a set of other key quarterly macroeconomic indicators covering the Danish economy since 1948. Based on these new data sets the paper reviews the empirical evidence on shocks to financial stability and the linkages between the financial sector and the real economy in the Danish post-war period that can be uncovered using structural vector autoregressive (VAR) models.

VAR models have found extensive use in relation to studies on monetary transmission and have more recently also found use in relation to studies on the robustness of the banking system to adverse macroeconomic shocks and on the feedback effects on the macroeconomy of shocks to financial stability. The new long-span data sets presented in the paper make it possible to estimate VAR models of higher dimensions than usually found in studies covering not only Denmark but also many other countries due to lack of degrees of freedom.

The standard VAR model used in the literature for analysing monetary transmission usually includes three endogenous variables: Real GDP, CPI, and the short-term interest rate. In addition to these three variables the VAR models estimated in this paper includes six more endogenous variables commonly known to be of interest in relation to financial stability. The additional six variables are the yield on long-term central-government bonds, share prices, broad money, domestic credit, house prices and the banks' write-down ratio (i.e. loan impairment charges in per cent of loans and guarantees).

In the VAR models the banks' write-down ratio is used as an indicator of the robustness of the banking sector, and widespread financial instability can be represented in the model via an exogenous shock to the banks' write-down ratio. Such a shock might be interpreted as a financial stability shock originating from within the banking sector, for instance a sudden reassessment of the credit quality of the banks' loan portfolio or a sudden extraordinarily increase in the banking sectors' risk aversion. However, the model allows for other interpretations as well. An extraordinarily large increase in the banking sector's write-down ratio could for instance reflect weakened confidence in the banking sector, which increases the saving behaviour of households and firms and generates a deep recession. The banks' write-downs express the banks' expected

future losses and historically write-downs have been booked 1-2 years before the losses are realised. The banks' write-down ratio is therefore also a useful indicator of current systemic stress or instability.

The results of the VAR analysis in the paper indicate that an exogenous increase in the banking sector's write-down ratio is related to a significant and long-lasting decline in domestic credit, house prices and real GDP. This finding is consistent with recent economic-historical research, which indicates that the economic recovery after a banking crisis tends to be slower than normal.

The VAR model estimated in the paper has found use as a tool to quantify the real effects of banking crises in Danish post-World War II economic history, cf. Abildgren, Kim, Birgitte Vølund Buchholst, Atef Qureshi and Jonas Staghøj, Real Economic Consequences of Financial Crises, *Danmarks Nationalbank Monetary Review*, Vol. 50(3:2), 2011, pp. 1-49. In this study the authors estimated the development in real GDP five years ahead, corresponding to the extraordinary increases in the Danish banking sector's write-downs in 1991-93 and 2008. The extraordinary increase in the banks' write-downs in 2008 was equivalent to real GDP in the 1st half of 2010 being around 3 per cent lower than in a baseline scenario without a financial crisis. Similarly, the extraordinary increases in the banking sector's write-downs in 1991-93 became – over a few years – equivalent to a level of real GDP that was around 3 per cent lower than in the baseline scenario.

1. Introduction

In the wake of the international financial crisis 2008/2009, the interactions between the banking system and the macro economy have once again been among the issues at the top of the research agenda. A deeper empirical understanding of these issues requires a careful analysis of the rich and complicated dynamic interactions between a range of macroeconomic variables and could therefore benefit from access to long-span consistent time series of national accounts and other key macroeconomic indicators at a quarterly frequency. Unfortunately, researchers often have to rely on either long annual time series or quarterly data covering only the most recent decades.

The expansion of the official statistics with quarterly national accounts occurred rather late in Denmark compared to other countries. In the USA quarterly national accounts were introduced already in the 1940s, UK and Canada followed in the 1950s and Sweden and Finland in the 1960s. Statistics Denmark – the central bureau of statistics in Denmark – only introduced quarterly national accounts for Denmark in 1988 and the first release covered just 6 quarters of data (Berner & Thage, 1989; Graversen *et al*., 2008). At a later stage Statistics Denmark released series back to 1977 (Sørensen, 1994a, 1994b, 1994c).

No official quarterly national accounts are available for Denmark prior to 1977. For selected pre-1977 periods other authors have previously published quarterly national-account data for Denmark following different compilation methods. However, the lack of a consistent set of long-span quarterly national-account aggregates prior to 1977 limits the scope for business cycle analysis and short-term dynamic modelling of the Danish economy.

The paper at hand presents and documents a set of summary non-seasonally adjusted quarterly national accounts for Denmark in current and constant prices for the period since 1948. The data set contains a breakdown of GDP into private consumption, government consumption, gross investments, exports of goods and services and imports of goods and services. In order to facilitate the analytical application of the new historical quarterly national-account data, the author has also compiled a collection of seventeen other key quarterly macroeconomic indicators for the Danish economy covering the period since 1948.

Furthermore, as a first exploratory analysis of these two new data sets the paper reviews some of the stylised empirical evidence on the business cycle, monetary transmission and financial stability that can be uncovered from the data using filtering techniques and reduced-form VAR models. The two new long-span data sets make it possible to estimate VAR models of higher dimensions than usually found in studies covering not only Denmark but also many other countries due to lack of degrees of freedom. The VAR models presented in this paper contain nine endogenous variables. They are therefore able to add new empirical evidence on the influence of macroeconomic shocks on the banking sectors' write down ratio.

Furthermore, the models can also throw some new light on the output effects of shocks to financial stability.

2. Previous works on pre-1977 quarterly national accounts in Denmark

Danmarks Nationalbank – the central bank of Denmark – has compiled a rather detailed set of quarterly national-account statistics for the period since 1971 in relation to the construction of a macroeconometric model for Denmark (Christensen, 1989; Christensen & Knudsen, 1992; Danmarks Nationalbank, 2003). The work on quarterly national accounts at the Nationalbank is still going on. Each quarter the Nationalbank converts a large number of short-term business cycle indicators into a set of quarterly national-account figures in order to have a comprehensive and consistent picture of the latest economic development prior to the release of the official quarterly national-account data from Statistics Denmark.

Thygesen (1971) presents estimates of quarterly GDP in current prices 1951-1968 in relation to an econometric study on monetary transmission in Denmark. These GDP estimates are based on only three business cycle indicators (retail sales, exports and constructions started in a quarter).

Hansen & Paldam (1973) document a more detailed set of quarterly national-account indicators that served as the basis for a macroeconometric model at the Danish Council of Economic Advisors. However, the longest time series in the data set covers only the period 1960-1969, and many of the time series are even shorter. Furthermore, the data set is not tabulated in Hansen & Paldam, *op.cit.*, and is not available in the archives of the Danish Council of Economic Advisors.

3. Summary quarterly national accounts for Denmark 1948-2010 - compilation approach

In the quarterly national accounts 1948-2010 presented in this paper GDP is broken down into the following five expenditure items:

[E.1] Private consumption
[E.2] Government consumption
[E.3] Gross investments
[E.4] Exports of goods and services
[E.5] Imports of goods and services

The data set consists of non-seasonally adjusted data in current and constant prices. The description of data sources and compilation methods applied for the construction of the data set can be divided into three parts covering respectively the periods 1948-1971, 1971-1977, and 1977-2010. The series for the three sub-periods were subsequently chained together to the overall series.

Compilation approach 1977-2010

For the period 1977-2010 the data set builds directly on the non-seasonally adjusted quarterly national account data in current and constant prices published by Statistics Denmark. Adjustments have been made for breaks in the series in 1988 and 1990.

Compilation approach 1971-1977

Danmarks Nationalbank has compiled seasonally adjusted data in current and constant prices covering the period 1971-1977. These series were converted into non-seasonally adjusted data using seasonal factors from 1977[2] based on the quarterly national accounts from Statistics Denmark.

Compilation approach 1948-1971

The compilation approach for the pre-1971 period has to a high degree been determined by data availability. An important design criterion was to be able to base the quarterly national accounts series on a fairly consistent set of key business cycle indicators published on a quarterly basis without (or nearly without) gaps.

For the pre-1971 calculations the five expenditure items of GDP were disaggregated further into a total of twelve expenditure items, cf. Table 1.

Table 1: Quarterly indicators used in the compilation procedure 1948-1971

National accounts expenditure component		Quarterly indicator		
		[a] Current prices	[b] Constant prices	[c] Price index
[E.1] Private consumption	[E.1a] Retail goods	Value index for retail sales	Accounting identity (a/c)	Consumer price index
	[E.1b] Purchase of vehicles	Accounting identity (b*c)	Number of new registrations of personal vehicles	Consumer price index
	[E.1c] Other private consumption	NO INDICATOR	NO INDICATOR	NO INDICATOR
[E.2] Government consumption		NO INDICATOR	NO INDICATOR	NO INDICATOR
[E.3] Gross investments	[E.3a] New construction of residential buildings	Accounting identity (b*c)	Number of dwellings started (lagged 1 quarter)	Index for building costs
	[E.3b] New construction of other buildings and civil engineering works	Accounting identity (b*c)	Gross floor space (m2) of new buildings started excluding dwellings started (lagged 1 quarter)	Index for building costs
	[E.3c] Other gross fixed business investments	Accounting identity (b*c)	Number of new registrations of commercial vehicles	Wholesale price index
	[E.3d] Changes in inventories	NO INDICATOR	NO INDICATOR	NO INDICATOR
[E.4] Exports of goods and services	[E.4a] Goods	Value of exports of goods	Accounting identity (a/c)	Export unit values for goods
	[E.4b] Services	Value of exports of services	Accounting identity (a/c)	Export unit values for goods
[E.5] Imports of goods and services	[E.5a] Goods	Value of imports of goods	Accounting identity (a/c)	Import unit values for goods
	[E.5b] Services	Value of imports of services	Accounting identity (a/c)	Import unit values for goods

[2] The seasonal factors for 1977 and the nearest following years in the quarterly national accounts from Statistics Denmark are relatively stable.

For nine of the twelve expenditure items ([E.1a], [E.1b], [E.3a], [E.3b], [E.3c], [E.4a], [E.4b], [E.5a] and [E.5b]) the quarterly national-account data were compiled via a two-step procedure: In step 1 a quarterly indicator in both current as well as constant prices was constructed for each of the nine expenditure components, cf. Table 1. In step 2 figures for the nine expenditure components in current and constant prices from the annual national-account statistics released by Statistics Denmark for the years 1948-1971 were interpolated on quarters utilising the indicators constructed in step 1 as distributions keys.

One simple approach would have been to distribute the observations from the annual national-account statistics proportionally over the four quarters of the year using the quarterly indicator series as distribution keys. However, such a procedure would lead to discontinuities around each year turn in the quarterly national-account series (in the literature known as the "step problem"). The technique used for the interpolation in step 2 was therefore based on the so-called "Proportional Denton Least Square Method", cf. Denton (1971).[3] This method minimises the least-squares differences in the quarter-on-quarter development in the ratio between the quarterly interpolated national-account series and the quarterly indicator series subject to the constraint that the sum of the quarterly interpolated national-account series over the four quarter within a year should be equal to the annual national-account figure. Mathematically the Proportional Denton Method can be formulated as follows:

$$[1] \quad \underset{(QNA_1, \cdots, QNA_T)}{\text{minimise}} \sum_{t=2}^{T} \left(\frac{QNA_t}{I_t} - \frac{QNA_{t-1}}{I_{t-1}} \right)^2 \quad \text{subject to} \quad \sum_{t=4y-3}^{4y} QNA_t = ANA^y \;, \quad y=1, \ldots, A$$

where:

QNA_t = the observation in quarter t in the interpolated quarterly national account series.
ANA^y = the observation in year y in the annual national account series.
I_t = the observation in quarter t in the quarterly indicator series.
T = the last quarter for which the quarterly indicator series is available and the last quarter for which the quarterly national account series is to be interpolated.
A = the last year for which the annual national account series is available.

As shown in Table 1 no indicator series were available for three of the twelve expenditure components ([E.1c], [E.2] and [E.3d]). For these components the quarterly national account series had to be based solely on the annual national account statistics in current and constant prices. The quarterly national-account data for these three items were therefore constructed

[3] The Proportional Denton Least Square Method is recommended as the preferred method to compile quarterly national-account data on the basis of annual national accounts and a quarterly indicator series in the IMF manual on quarterly national accounts, cf. chapter 6 in Bloem *et al.* (2001).

using the mechanical least-squares-based technique described in Boot *et al*. (1967).[4] This method - which ensures a smooth quarterly interpolated national-account series - minimises the squared first differences of the quarterly interpolated national-account series subject to the constraint that the sum over the four quarters within a year is equal to the correspondent annual national-account figure. The method can be formulated as follows:

$$[2] \quad \underset{(QNA_1, \cdots, QNA_T)}{\text{minimise}} \sum_{t=2}^{T} \left(QNA_t - QNA_{t-1}\right)^2 \quad \text{subject to} \quad \sum_{t=4y-3}^{4y} QNA_t = ANA^y, \quad y = 1, \ldots, A$$

where:

QNA_t = the observation in quarter t in the interpolated quarterly national account series.
ANA^y = the observation in year y in the annual national account series.
T = the last quarter for which the quarterly national account series is to be interpolated.
A = the last year for which the annual national account series is available.

A first look on the data set

Annex A contains a more detailed documentation of the data sources used to construct the quarterly national accounts 1948-2010 whereas annex B lists the data set. This data set is also available in electronic form on request from the author.

Nominal and real year-on-year growth rates of the quarterly national-account aggregates are shown in Chart 1-7. These charts put the recent great recession in a clear historical perspective. Measured by real GDP year-on-year growth rates the recession in 2008/2009 following the international financial crisis has been the deepest downturn in the post–1948 period, cf. Chart 7. This recession in 2008/2009 was mainly characterised by significant drops in the private consumption and in the exports of goods and services, cf. Chart 1 and 5. The decline in total domestic demand in 2008/2009 was by and large at the same level as the decline experienced following the first and second oil-price shocks in the 1970s and early 1980s, cf. Chart 4.

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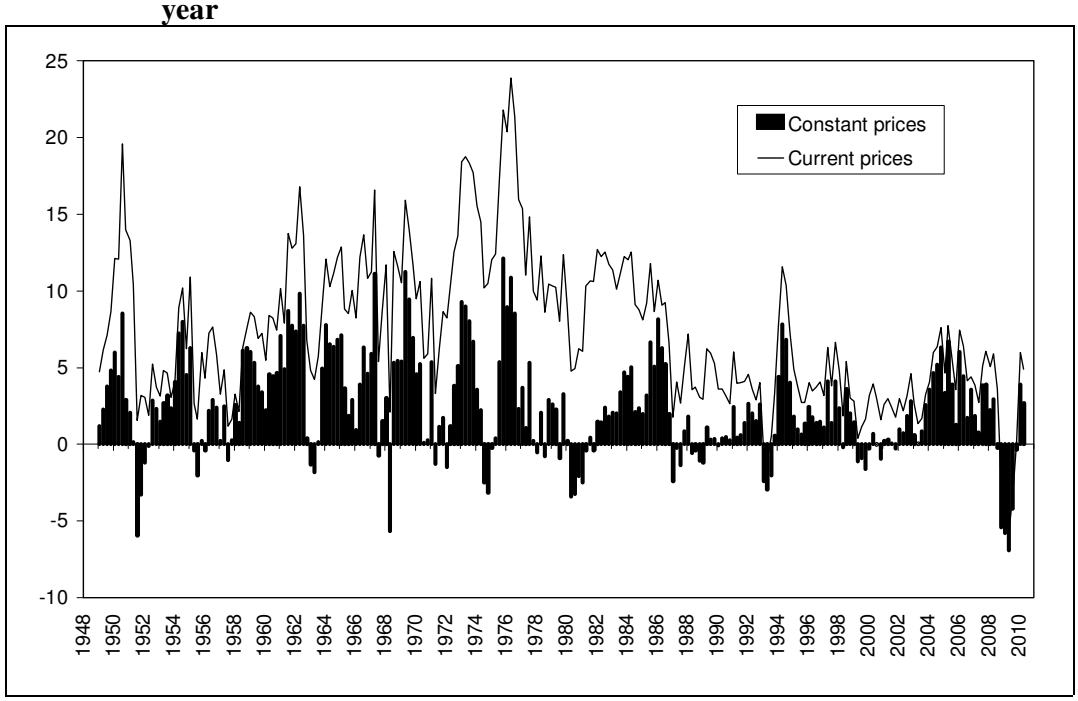
[4] The least-squares technique presented in Boot *et al*. (1967) is one of the methods recommended in the IMF manual on quarterly national accounts when one has to compile quarterly national-account data on the basis of annual national accounts and no relevant quarterly indicators are available, cf. chapter 7 in Bloem *et al.* (2001).

In case of gross investment in stock building the procedure in Boot *et al*. (1967) was only applied to the figures in current prices. Here the quarterly figures in constant prices were calculated on the basis of the figures in current prices deflated by the consumer price index.

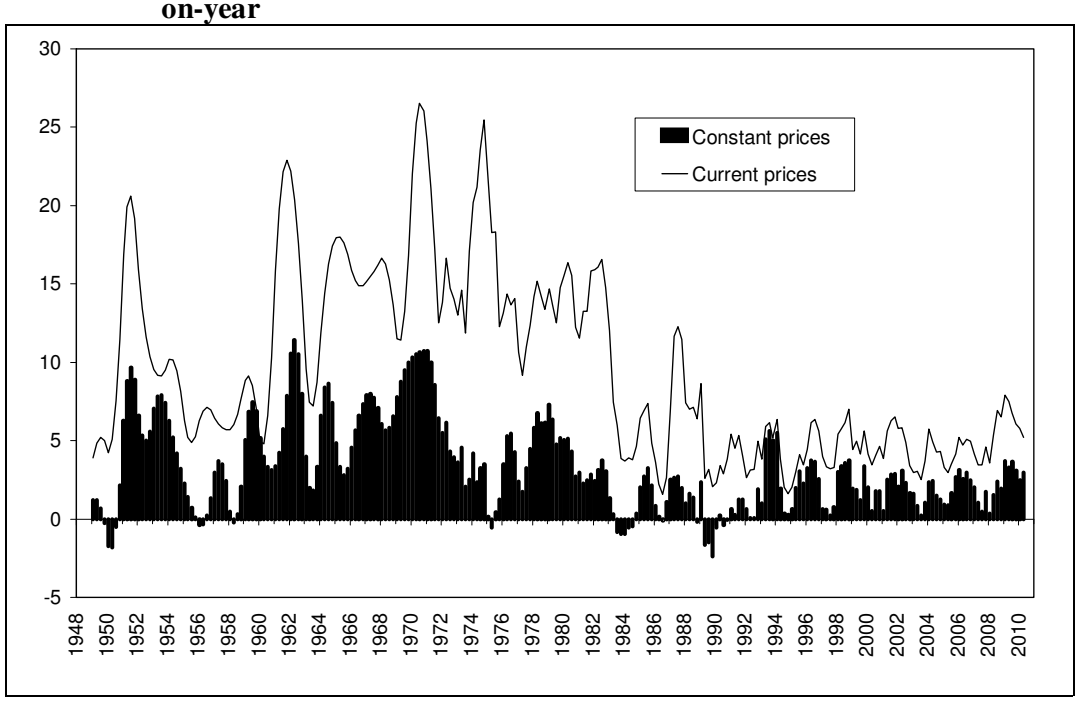
It would have been possible to incorporate seasonal variation into the quarterly interpolated national-account series for [E.1c] Other private consumption and [E.2] Government consumption based on seasonal factors from the year 1977 in Statistics Denmark's quarterly national-account statistics. However, there is almost no seasonal pattern in these two series.

Chart 1: Growth in private consumption 1949q1-2010q2, per cent year-on-year



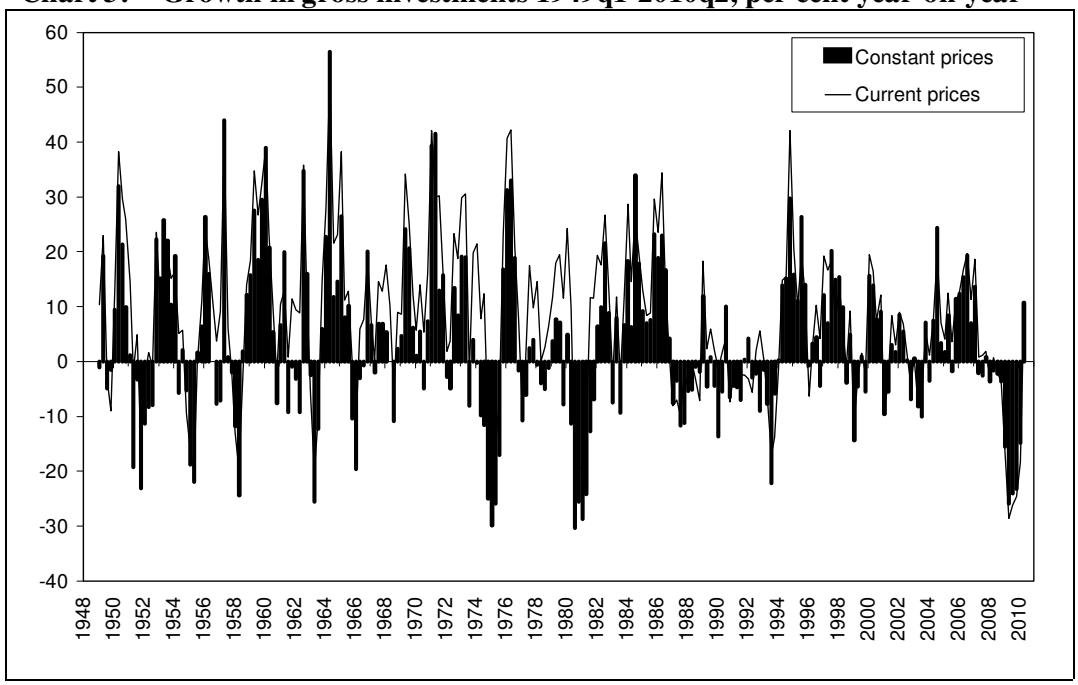
General note: Non-seasonally adjusted data.
Source: Author's calculations, cf. the main text and annex A.

Chart 2: Growth in government consumption 1949q1-2010q2, per cent year-on-year



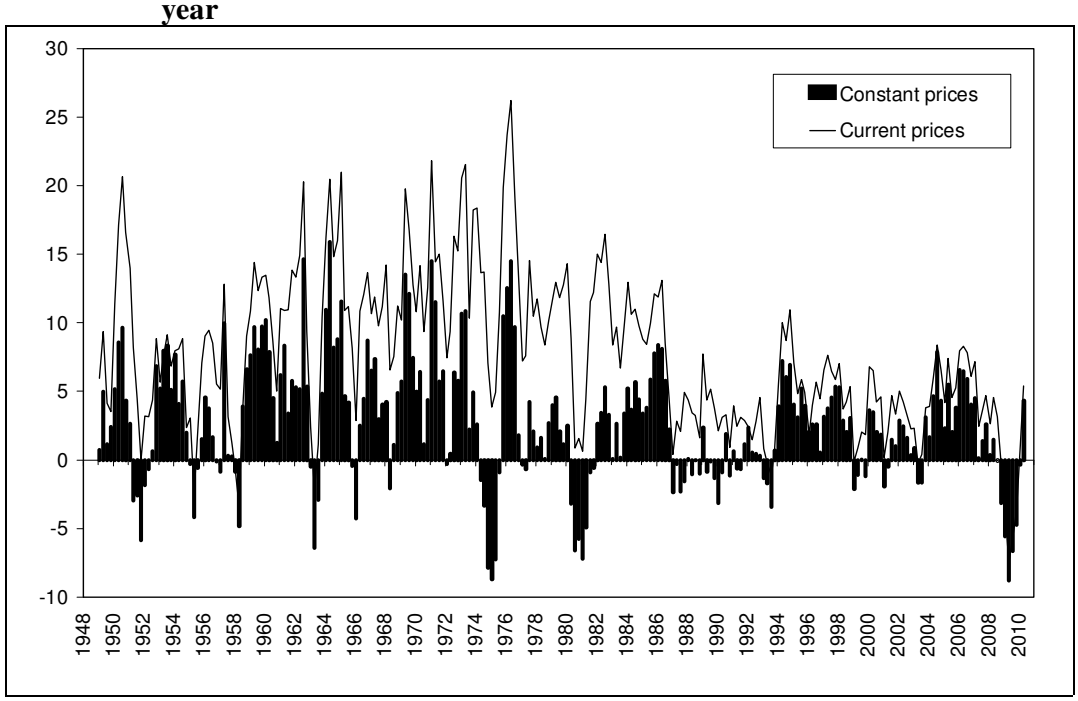
General note: Non-seasonally adjusted data.
Source: Author's calculations, cf. the main text and annex A.

Chart 3: Growth in gross investments 1949q1-2010q2, per cent year-on-year



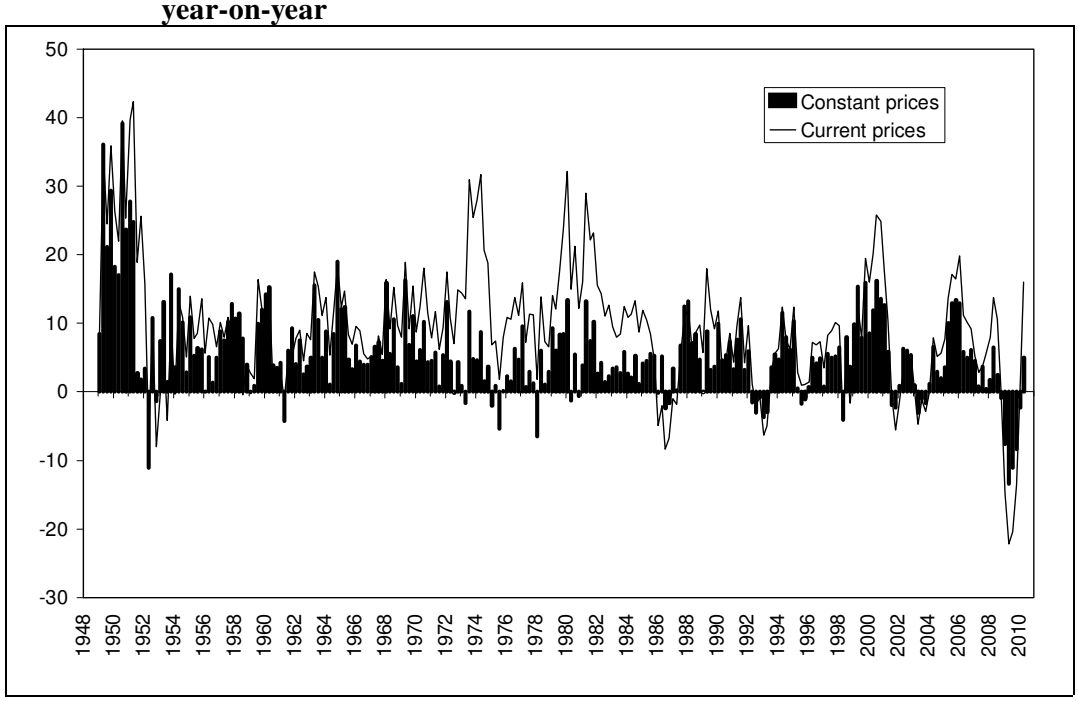
General note: Non-seasonally adjusted data.
Source: Author's calculations, cf. the main text and annex A.

Chart 4: Growth in total domestic demand 1949q1-2010q2, per cent year-on-year



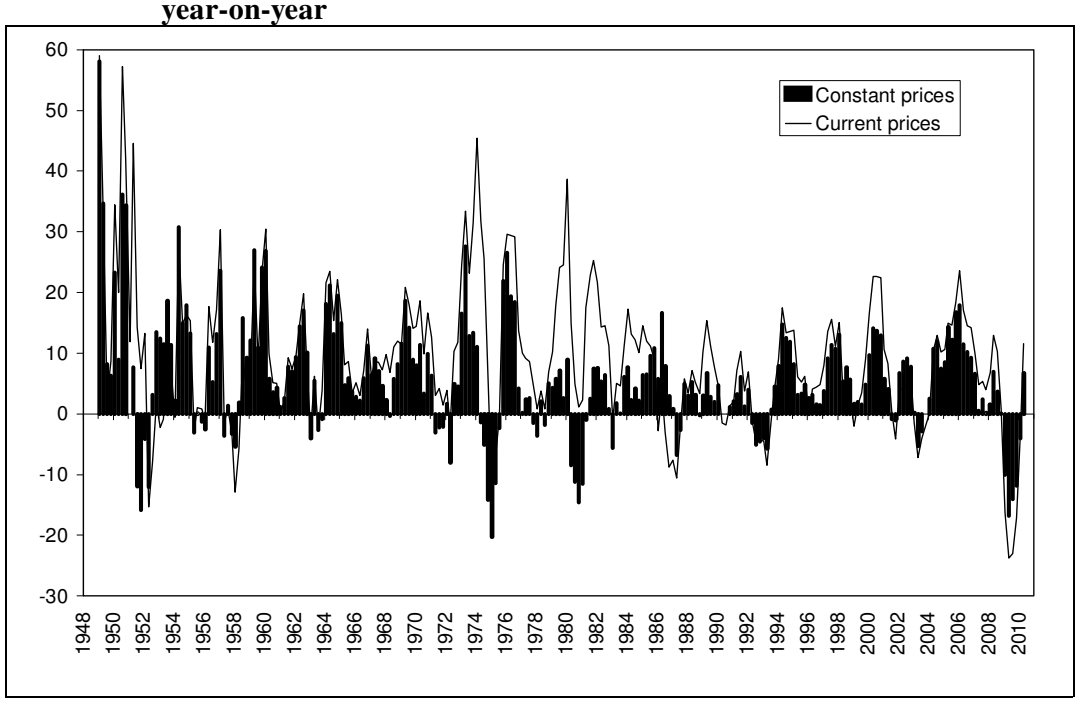
General note: Non-seasonally adjusted data.
Source: Author's calculations, cf. the main text and annex A.

Chart 5: Growth in exports of goods and services 1949q1-2010q2, per cent year-on-year



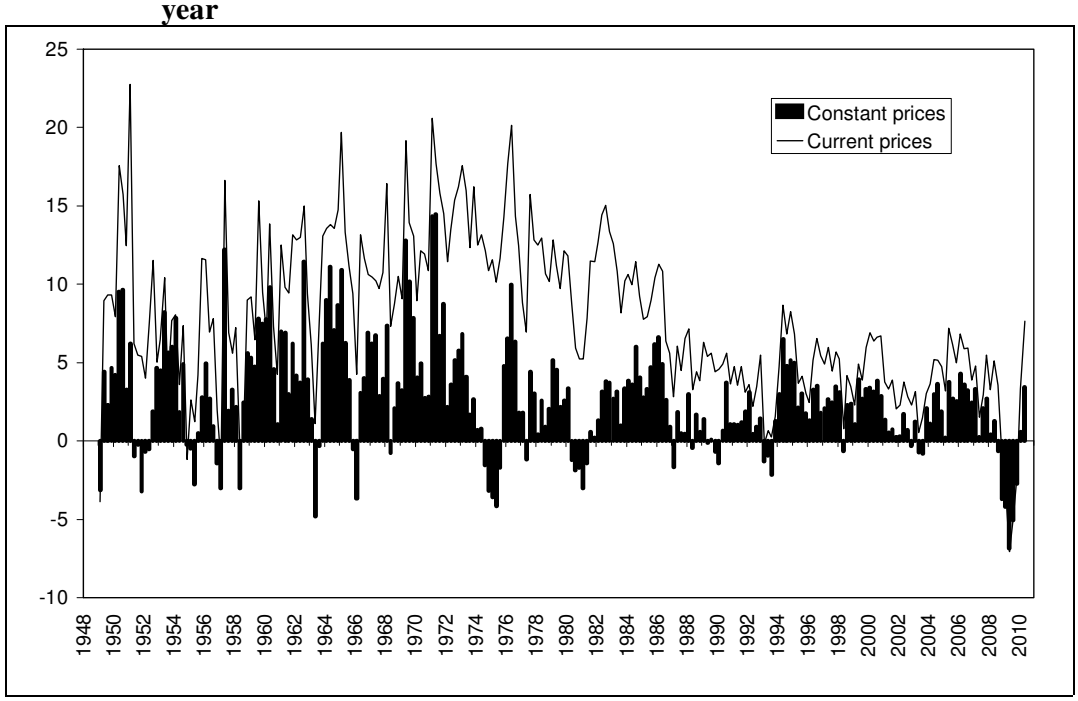
General note: Non-seasonally adjusted data.
Source: Author's calculations, cf. the main text and annex A.

Chart 6: Growth in imports of goods and services 1949q1-2010q2, per cent year-on-year



General note: Non-seasonally adjusted data.
Source: Author's calculations, cf. the main text and annex A.

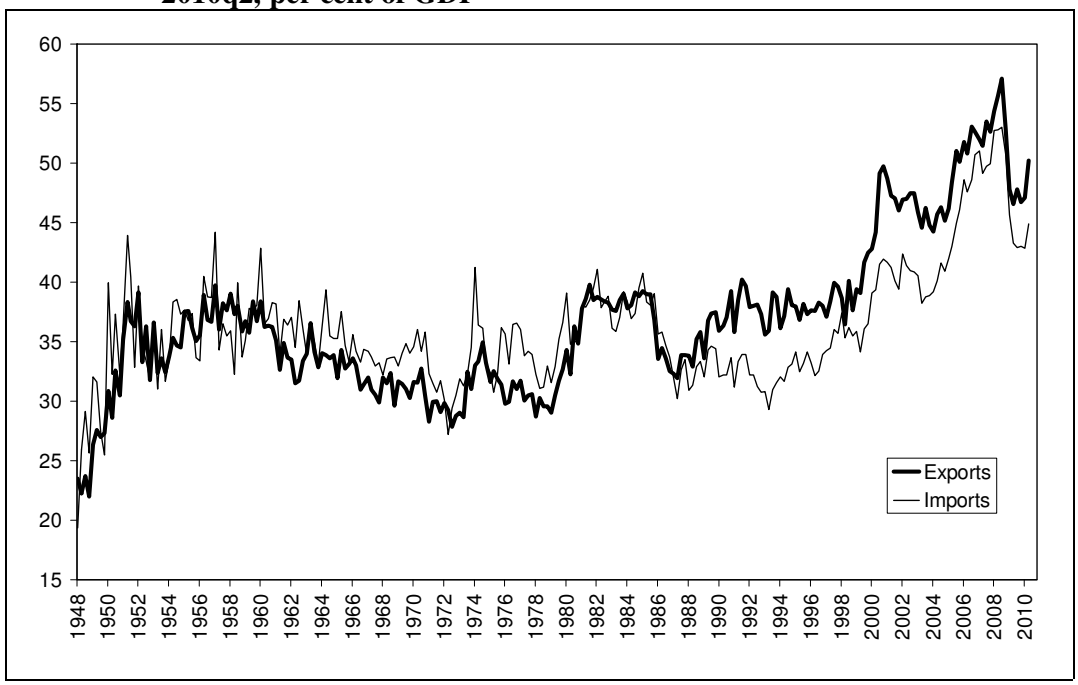
Chart 7: Growth in gross domestic product 1949q1-2010q2, per cent year-on-year



General note: Non-seasonally adjusted data.
Source: Author's calculations, cf. the main text and annex A.

During the 1930s and the World War II the international economy had developed into a system characterised by a complex net of bilateral clearing and payment arrangements. The very high growth rates of imports and exports during the late 1940s and early 1950s, cf. Chart 5 and 6, reflect the deregulation of quantitative trade restrictions within the framework of the Organisation for European Economic Co-operation (OEEC). The process was facilitated by the Marshall Aid 1948-1953 and the establishment of the European Payment Union (EPU) in 1950 which ensured a high degree of *de facto* internal current-account convertibility among the participating European currencies – including Danish kroner – through a monthly multilateral clearing system for current payments, cf. Mikkelsen (1999). The export and import ratios for the Danish economy increased from around 20-25 per cent of GDP in 1948 to around 35-40 per cent in the early 1950s, cf. Chart 8.

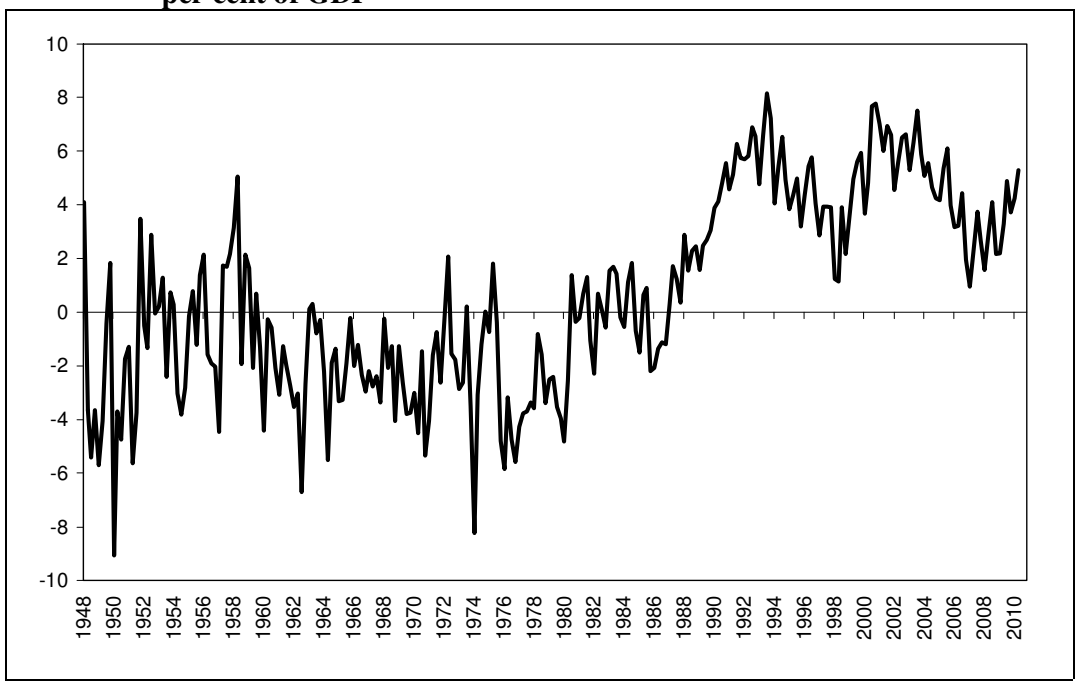
Chart 8: Exports and imports of goods and services in current prices 1948q1-2010q2, per cent of GDP



General note: Non-seasonally adjusted data.
Source: Author's calculations, cf. the main text and annex A.

The growth pattern of the Danish economy during the 1950s, cf. Chart 7, reflects the stop-go policy adopted during this period in order to trade-off the desire for full employment and the need to keep the balance of payments close to zero. At the end of the 1950s the scope for Danish foreign borrowing improved significantly and the 1960s and early 1970s were most of the period characterised by solid growth. The 1960s also saw the build up of a large tax-financed welfare state, which is reflected in the substantial real growth rates in government consumption, cf. Chart 2. The expansion of the domestic economy during the 1960s resulted in a significant deficit on the trade balance, cf. Chart 9. The negative growth rate in real GDP in 1963 in Chart 7 reflects a tightening of economic policies with the introduction of a general sales tax in 1962 and a number of income policy measures ("the package solution") in 1963 in order to address the weakening of the trade balance. The negative growth rate in real GDP in the first half of 1966 also reflects a tightening of economic policies (the general sales tax was increased in 1965) combined with a long winter in 1965/1966.

Chart 9: Net exports of goods and services in current prices 1948q1-2010q2, per cent of GDP



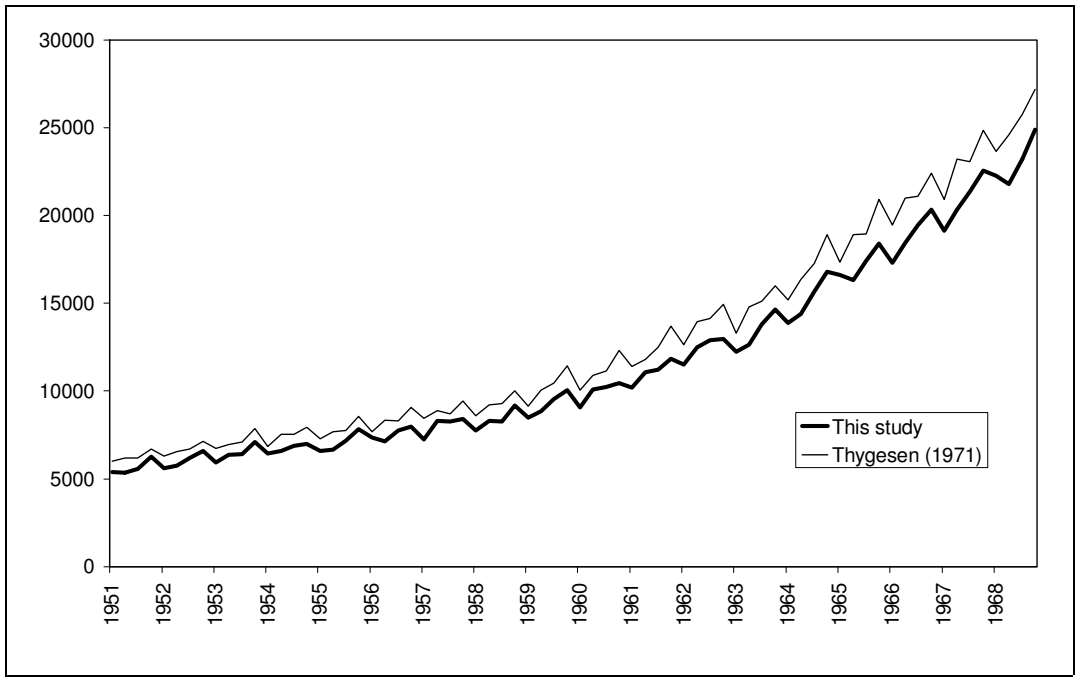
General note: Non-seasonally adjusted data.
Source: Author's calculations, cf. the main text and annex A.

A more detailed description of the economic development in Denmark 1948-1971 is found in Johansen (1987); Hansen *et al*. (1988); Pedersen, P. J. (1996) and Økonomiministeriet (1997). The period since 1971 is e.g. covered by Danmarks Nationalbank (2003) and Johansen & Trier (2010). Some of the stylised facts and empirical regularities of the post-1948 Danish business cycles will be further reviewed in section 5 below.

As a robustness check on the pre-1971 data construction Chart 10 and 11 compare the development in the series for the nominal gross domestic product 1951-1968 constructed in the paper at hand with the series presented in Thygesen (1971). Taking into account that the two data series are based on rather different data sources and compilation procedures the two series seem in broad terms to paint the same picture of the economic development in Denmark 1951-1968.[5]

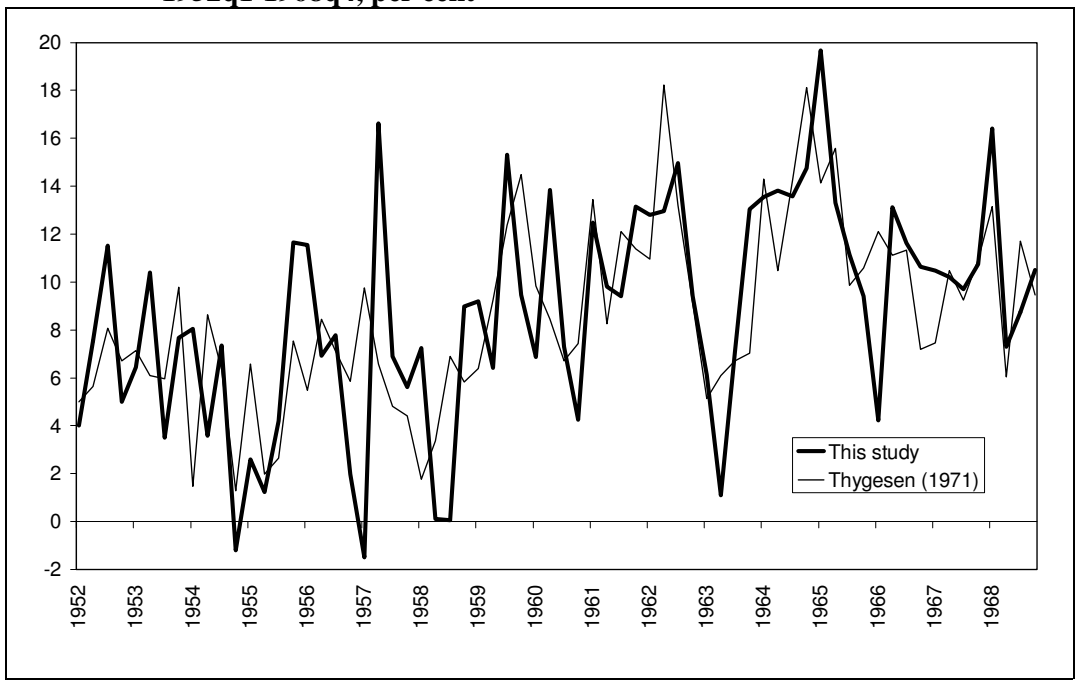
[5] The correlation coefficient between the to series in Chart 10 (11) is 1.00 (0.62).

Chart 10: Gross domestic product, current prices 1951q1-1968q4, million kroner



General note: Non-seasonally adjusted data.
Source: Annex B and Thygesen (1971).

Chart 11: Year-on-year growth in gross domestic product, current prices 1952q1-1968q4, per cent



General note: Non-seasonally adjusted data.
Source: Annex B and Thygesen (1971).

4. A supplementary data set on key quarterly macroeconomic indicators 1948-2010

In order to enhance the analytical application of the new historical quarterly national-account data the author also compiled a collection of seventeen other non-seasonally key quarterly economic indicators for the Danish economy covering the period 1948-2010, cf. Table 2.

Table 2: Key quarterly macroeconomic indicators 1948-2010

Indicator	Notes
[I.1] Unemployment rate	Unemployed persons in per cent of the total labour force. Quarterly averages.
[I.2] Index of average hourly earnings in manufacturing industries	Quarterly averages.
[I.3] Official discount rate of Danmarks Nationalbank	Quarterly averages.
[I.4] Yield on long-term Danish government bonds	Quarterly averages.
[I.5] Private banks' average lending rate	Weighted average lending interest rate of savings banks and commercial banks.
[I.6] Private banks' average deposit rate	Weighted average deposit interest rate of savings banks and commercial banks.
[I.7] Nominal effective krone-rate index	Trade-weighted average of the development in the bilateral nominal krone-rate vis-à-vis the currencies of a range of Denmark's main trading partners. An increase in the index describes an overall nominal appreciation of the Danish krone vis-à-vis the currencies of Denmark's main trading partners. Quarterly averages.
[I.8] Consumer price index, Denmark	Quarterly averages.
[I.9] Consumer price index, abroad	Trade-weighted average of the consumer price development in Denmark's main trading partners. Quarterly averages.
[I.10] Real effective krone-rate index with consumer prices as deflator	Trade-weighted average of the development in the bilateral real krone-rate vis-à-vis the currencies of a range of Denmark's main trading partners. CPIs are used as deflators. An increase in the index describes an overall real appreciation of the Danish krone vis-à-vis the currencies of Denmark's main trading partners. Quarterly averages.
[I.11] Price index for sale of one-family houses	Quarterly averages.
[I.12] Share price index	End of quarter.
[I.13] Broad money stock (M2)	End of quarter.
[I.14] Credit to the domestic non-bank sector extended by resident commercial banks and savings banks	End of quarter.
[I.15] Credit to the domestic non-bank sector extended by resident mortgage banks	End of quarter.
[I.16] Credit to the domestic non-bank sector extended by all resident banks	[I.16] = [I.14] + [I.15]. End of quarter.
[I.17] Bank's write-downs ratio	Quarterly write-downs on loans and guaranties in per cent of end-quarter outstanding loans and guaranties. The write-down ratio is not annualised and covers write-downs in commercial banks and savings banks only.

A number of adjustments have been made in order to transform the background data into a set of reasonable consistent set of economic indicators. Furthermore, it should be mentioned that most of the quarterly data on bank's write-down ratio have been interpolated from semi-annual or annual data. It should also be noted, that for long periods the discount rate has not been directly related to any of Danmark Nationalbank's monetary-policy instruments. However, for most of the post-1948 period the discount rate has served as a signal rate indicating the general level of monetary-policy interest rates in Denmark.

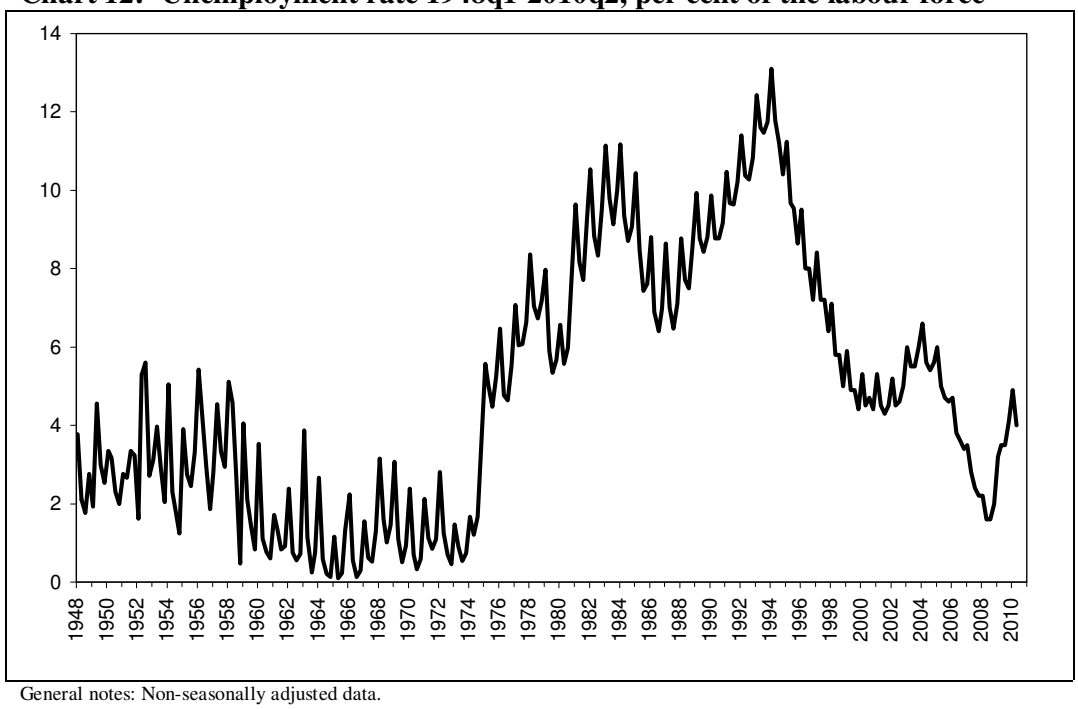
The supplementary data set on key quarterly macroeconomic indicators 1948-2010 is shown in Chart 12-19. During the solid growth in the Danish economy in the 1960s and early 1970s the unemployment rate was at a very low level, cf. Chart 12. The seasonal volatility in the

unemployment figures seems to be relatively high in the period until the early 1970s compared to the post-1970 period. This might be related to data issues but could also reflect improved utilisation of the work force over the seasons during the last four decades, i.e. within the building sector (pre-cast building).

The macroeconomic performance of the Danish economy deteriorated significantly during the 1970s, particularly in the second half of the decade. The oil price shocks of the 1970s and the devaluations of the krone caused a continuous upward pressure on price and wage inflation and on nominal interest rates, cf. Chart 13 and 15. Furthermore, unemployment increased rapidly. Due to worse inflationary performance than its main trading partners Denmark experienced a marked appreciation of the real effective exchange rate from the late 1940s to the late 1970s, cf. Chart 14.

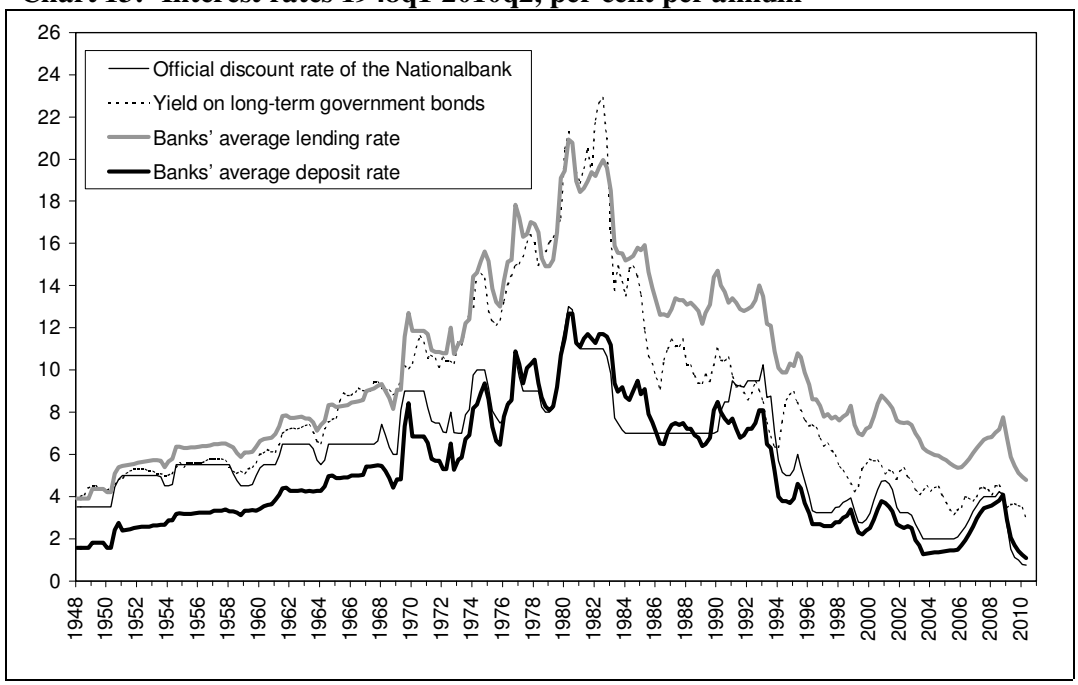
The post-1980 period witnessed significant improvements in the macroeconomic performance of the Danish economy. Consumer price inflation declined from two digit-figures in the early 1980s to a level around 2 per cent in the early 1990s. The unemployment rate stayed at a high level until the middle of the 1990s but has since declined significantly.

Chart 12: Unemployment rate 1948q1-2010q2, per cent of the labour force



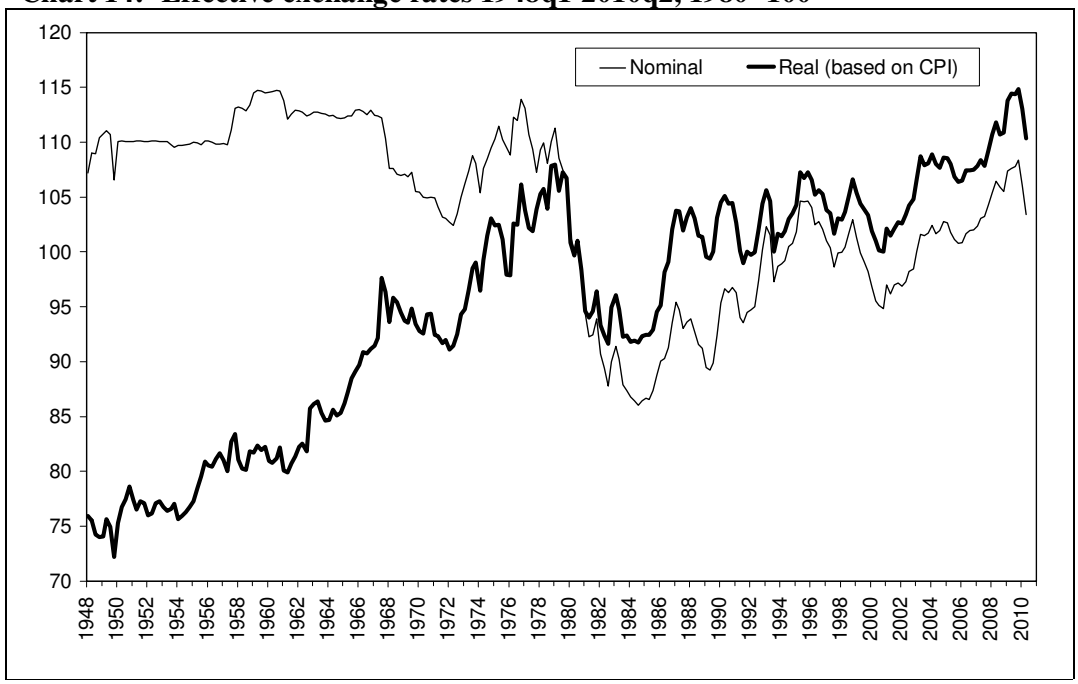
General notes: Non-seasonally adjusted data.
Source: Author's calculations, cf. the main text and annex A.

Chart 13: Interest rates 1948q1-2010q2, per cent per annum



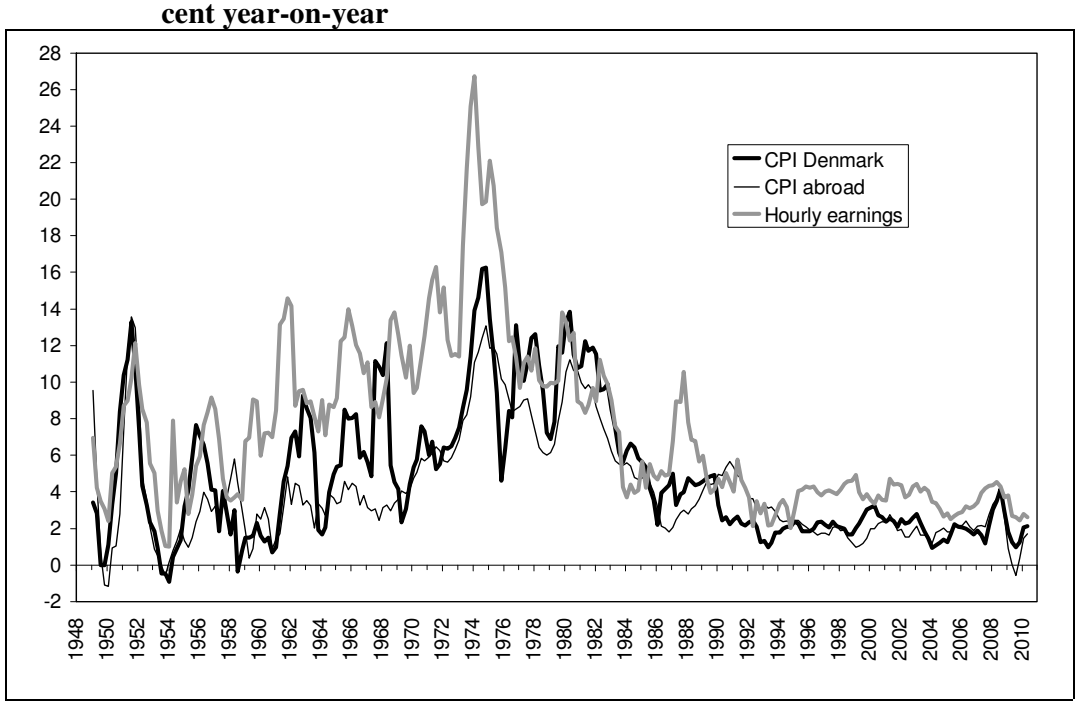
General notes: Non-seasonally adjusted data.
Source: Author's calculations, cf. the main text and annex A.

Chart 14: Effective exchange rates 1948q1-2010q2, 1980=100



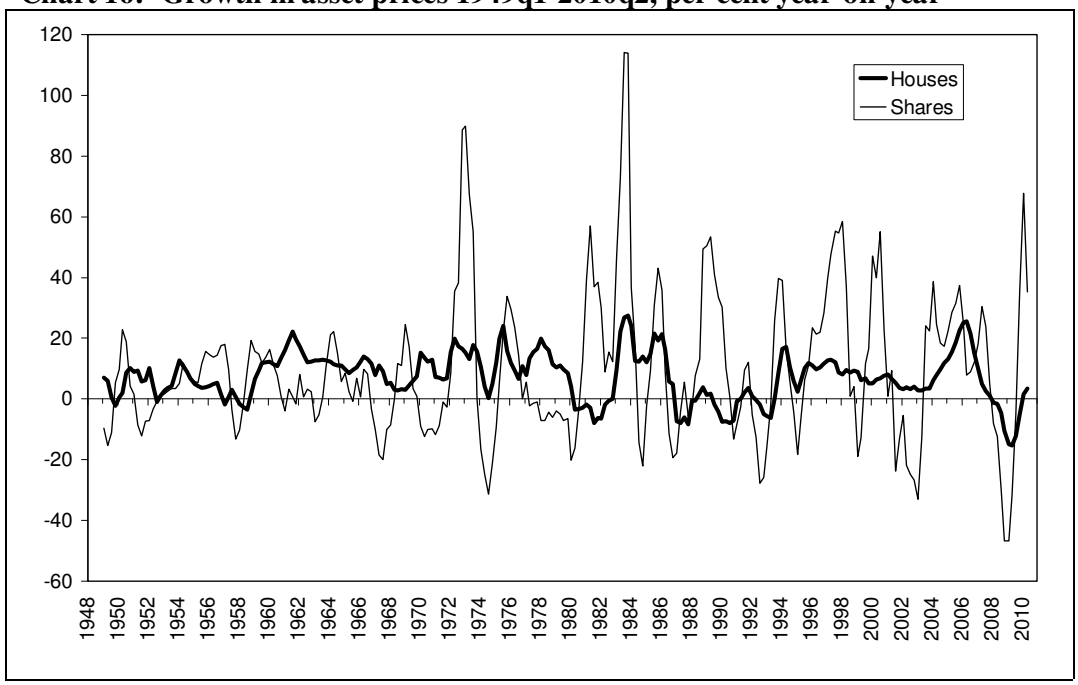
General notes: Non-seasonally adjusted data.
Source: Author's calculations, cf. the main text and annex A.

Chart 15: Growth in consumer prices and hourly earnings 1949q1-2010q2, per cent year-on-year



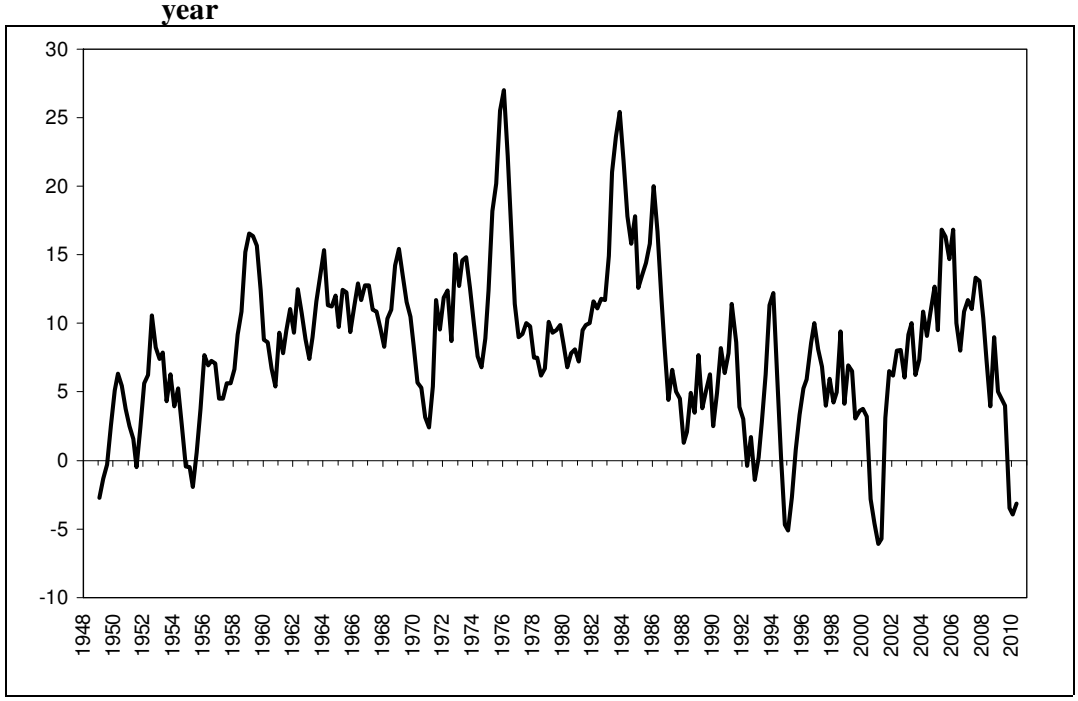
General notes: Non-seasonally adjusted data.
Source: Author's calculations, cf. the main text and annex A.

Chart 16: Growth in asset prices 1949q1-2010q2, per cent year-on-year



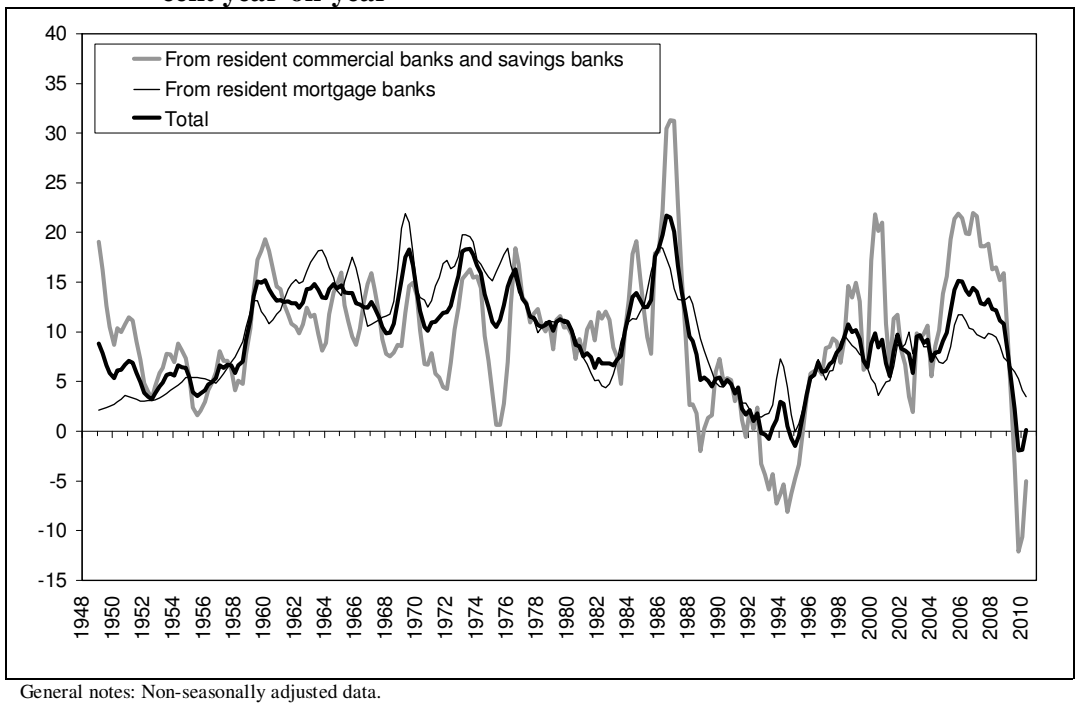
General notes: Non-seasonally adjusted data.
Source: Author's calculations, cf. the main text and annex A.

Chart 17: Growth in broad money stock (M2) 1949q1-2010q2, per cent year-on-year



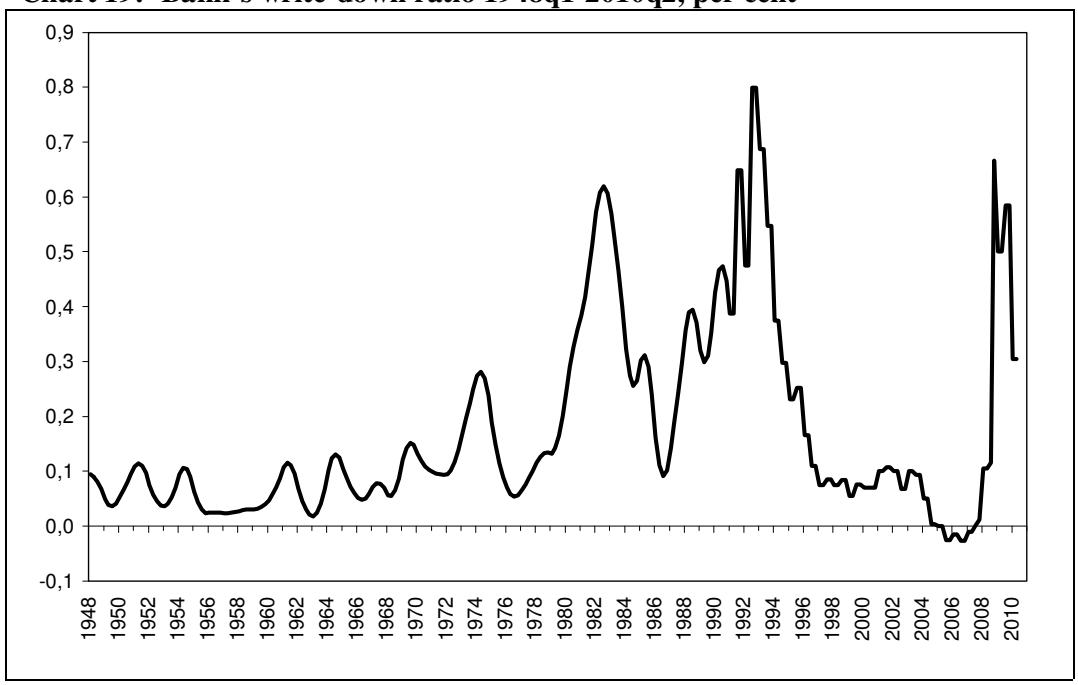
General notes: Non-seasonally adjusted data.
Source: Author's calculations, cf. the main text and annex A.

Chart 18: Growth in credit to the domestic non-bank sector 1949q1-2010q2, per cent year-on-year



General notes: Non-seasonally adjusted data.
Source: Author's calculations, cf. the main text and annex A.

Chart 19: Bank's write-down ratio 1948q1-2010q2, per cent



General notes: Non-seasonally adjusted data.
Source: Author's calculations, cf. the main text and annex A.

In the decades from the end of the Second World War and until the early 1980s, credit rationing and exchange controls served as important economic-policy instruments. The post-1980 period saw an increased influence from market forces due to financial liberalisation and internationalisation. In post-1980 period the swings in real credit growth have been substantial relative to the economic growth compared to the pre-1980 period, cf. Chart 18 and Abildgren (2009). Furthermore, the post-1980 period has seen more substantial swings in the growth rate of asset prices compared to the pre-1980 period, cf. Chart 16.

During the early 1980s, the beginning of the 1990s and again in the late 2000s a number of banks came into financial distress and those periods were been characterised by significant increased in the write-down ratio of the banking sector, cf. Chart 19.

Annex A contains a more detailed documentation of the data sources and methods used to construct the indicators in Chart 12-19 whereas annex C lists the data set. This data set is also available in electronic form on request from the author.

5. Some stylised facts on the Danish business cycle from band-pass filters

During the last couple of decades filtering methods have become the standard tools used in the literature for uncovering the more or less "pure" stylised facts and empirical regularities in the cyclical movement and comovement of macroeconomic time series, cf. e.g. Stock & Watson (1999) and Agresti & Mojon (2003). Filters repack economic time series so a clearer view of their periodic oscillations is obtained.

This section briefly reviews the post-1948 short-term cyclical cross-correlation pattern of the new historical time series presented in section 3 and 4 using filtering methods. The analysis complements the studies by Hansen & Knudsen (2004) and Hansen (2005) that cover the business cycles in Denmark 1974-2000.

The business cycle component of the time series will be isolated using the Baxter & King (1999) approximate band-pass filter. A band-pass filter eliminates the very high and very low frequencies from the time series in order to isolate the frequencies in the middle range that can be interpreted as the business cycle fluctuations. The Baxter-King filter converts an input series y_t into another (filtered) output series y_t^F via a finite centred linear moving average of the following form:

$$[3]\ y_t^F = \sum_{i=-K}^{K} w_i \cdot y_{t+i}$$

The filter is based on results from the spectral analysis where a time series is regarded as the composed of a number of components with different frequencies. If one wishes to extract the cyclical component with a duration from a to b quarters, the filter coefficients (w_i) used in the Baxter-King filter are found as:

$$[4]\ w_i = w_i^* - (2 \cdot K + 1)^{-1} \cdot \sum_{j=-K}^{K} w_j^*$$

where:

$$[5]\ w_i^* = \begin{cases} \pi^{-1} \cdot \left[\dfrac{2 \cdot \pi}{a} - \dfrac{2 \cdot \pi}{b} \right] & \text{for } i = 0 \\ (i \cdot \pi)^{-1} \cdot \left[\sin\left(\dfrac{2 \cdot \pi}{a} \cdot i \right) - \sin\left(\dfrac{2 \cdot \pi}{b} \cdot i \right) \right] & \text{for } i = \pm 1, \pm 2, \ldots, \pm K \end{cases}$$

The Baxter-King filter ensures that the filtered time series becomes de-trended and stationary in order to avoid spurious cycles.[6] Furthermore, since the filter coefficients are symmetric the filtered series have no phase shifts compared to the input series.

The number of filter coefficients (determined by the cut-off parameter K) influences the degree to which the filter approximates an ideal band-pass filter. The higher K the better approximation, but a high K also means loss of observations.

Following Baxter & King (1999) the business cycles frequencies in the paper at hand are delimited to 6-32 quarters. Naturally, such a limitation is more or less arbitrary, but the chosen definition has become more or less standard in the literature. The reason for 6 quarters

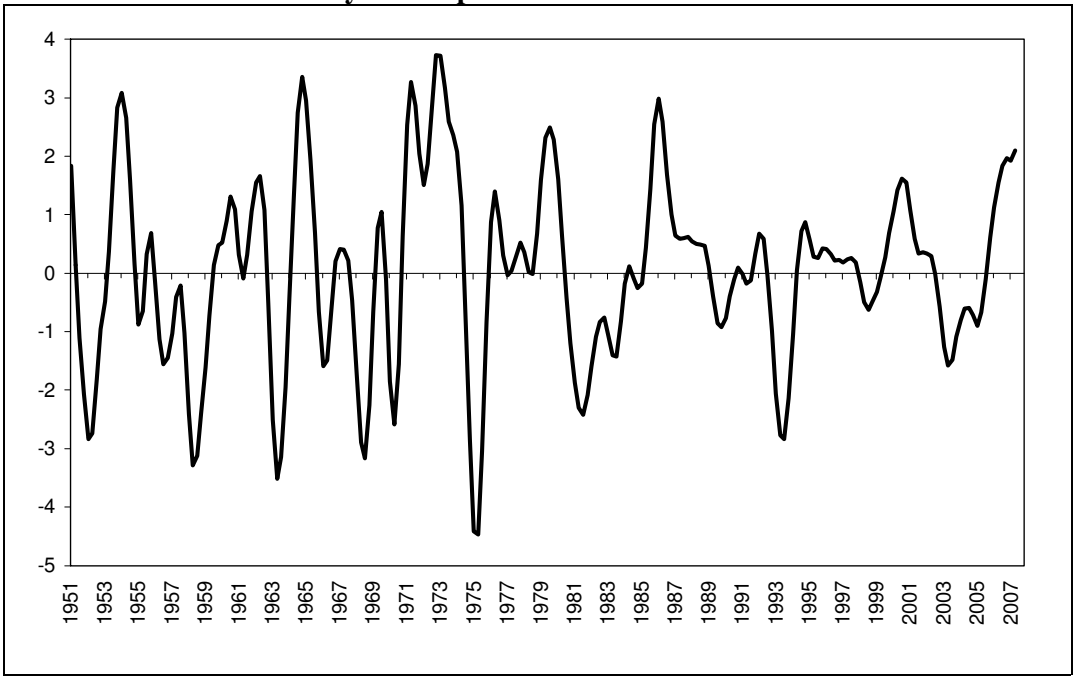
[6] The Baxter-King filter has been designed so that it will make the filtered time series stationary if the input series is integrated of order one or two, cf. Baxter & King (1999).

as the lower limit (and not zero) is the wish to exclude seasonality and very short-term random fluctuations from the business cycle component. The filter will be based on a symmetric moving average with 12 observations on each side, i.e. K=12.

By transforming a trended input series by natural logarithms before filtering, the cyclical component extracted from the data can[7] be interpreted as the deviation from the trend measured in per cent. This facilitates the economic interpretation of the filtered time series data. In this section all the time series - except interest rates, the unemployment rate, price- and wage-inflation rates and the bank's write-down ratio - have been transformed by natural logarithms before filtering.

Like most – if not all filters – the Baxter & King filter has its strengths and weaknesses, and different filters with different choices of parameters can produce different results.[8] However, the Baxter & King filter still belongs to the group of popular filtering methods in applied economics.

Chart 20: The business cycle component of real GDP in Denmark



General notes: Derivation from trend measured in per cent. Based on quarterly data 1948q1-2010q2.
Source: Author's calculations, cf. the main text.

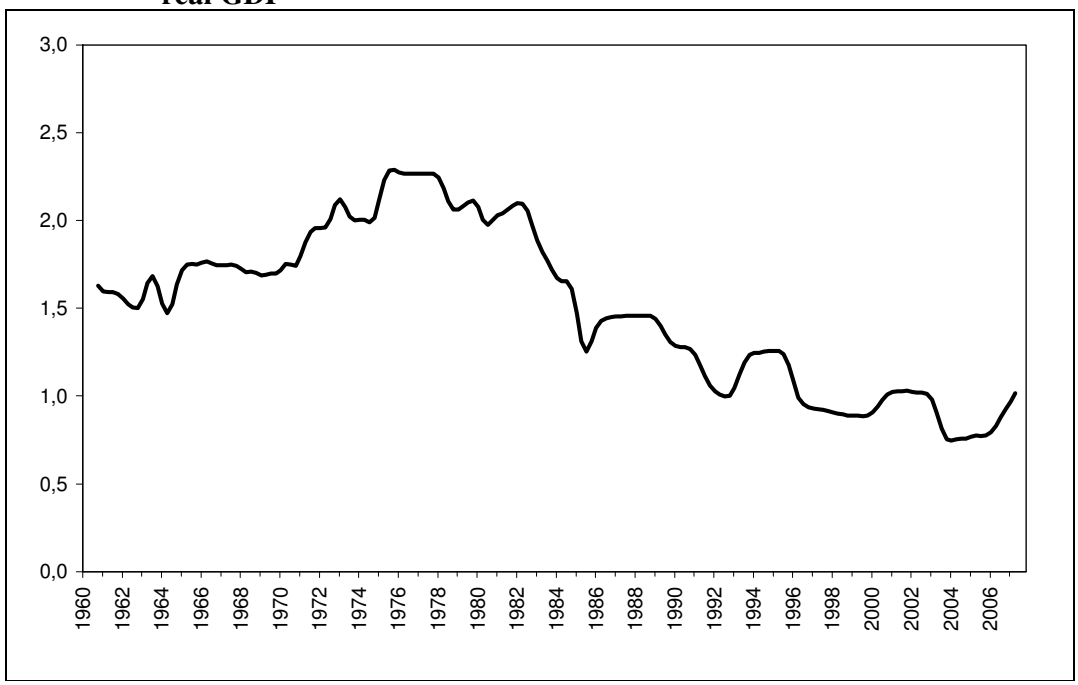
The cyclical component of real GDP is shown in Chart 20. Measured by the percentage derivation from the trend the deepest recession occurred in 1975 following the first oil-price shock. However, it should be noted that due to the compilation method of the cyclical

[7] When multiplied by 100.
[8] Cf. e.g. Gencay, Selcuk & Whitcher (2002) and Mills (2003) for an overview of a broad range of filtering methods applied in economics and finance.

component there is a loss of 12 observations at the beginning and at the end of the time series. The recession in 2008/2009 is therefore not visible in Chart 20.

Apparently the business cycle component became substantial less volatile in the decades from the mid-1970s to the mid-2000s prior to the outbreak of the recent financial crisis, cf. Chart 21 which shows the 10-year rolling standard deviations of the business cycle component of real GDP. Similar findings have been found for other countries and the reduction in volatility has been termed "the Great Moderation", cf. Blanchard & Simon (2001) and Stock & Watson (2003). The proposed explanations range from good practices (better inventory management, improved possibilities for consumption and investment smoothing due to new information technology combined with broader and deeper financial markets, more flexible labour markets) over good policy (more skilful macroeconomic stabilisation policy) to good luck (a reduction in the frequency and severity of exogenous economic shocks). Furthermore, the structural transformation of the economy towards increased production of services might also have contributed to the decline in volatility. However, the reasons are still debated in the literature, cf. Ćorić (2010).

Chart 21: 10-year rolling standard deviations of the business cycle component of real GDP



General notes: Based on quarterly data 1948q1-2010q2.
Source: Author's calculations, cf. the main text.

Table 3 shows the dynamic cross-correlations between the cyclical components of real GDP and the cyclical components of a range of other macroeconomic variables. While such cross-correlation coefficients are purely descriptive statistics - and do not indicate the direction of

causality of the underlying economic relationships - they offer an alternative way to look at the time series and may serve as a useful starting point to gain a deeper insight into the business cycle.

Table 3: Dynamic cross-correlations between the cyclical component of real GDP and the cyclical components of other macroeconomic variables

	Cross-correlation between X(t+j) and Y(t), where Y is the business cycle component of real GDP and X is the business cycle component of the variable in the first column										
X	j=-8	j=-4	j=-3	j=-2	j=-1	j=0	j=1	j=2	j=3	j=4	j=8
Real GDP	-0.122	0.023	0.275	0.600	0.885	**1.000**	0.885	0.600	0.275	0.023	-0.122
	(0.071)	(0.730)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.730)	(0.071)
Real privat consumption	-0.022	-0.029	0.167	0.377	0.528	**0.563**	0.460	0.279	0.093	-0.040	-0.079
	(0.741)	(0.666)	(0.013)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.164)	(0.553)	(0.243)
Real gross investments	-0.126	0.030	0.262	0.553	0.801	**0.895**	0.784	0.524	0.224	-0.012	-0.155
	0.063	0.654	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.854	0.022
Unemployment rate	0.279	0.129	-0.061	-0.267	-0.445	-0.564	**-0.606**	-0.584	-0.515	-0.419	-0.033
	(0.000)	(0.055)	(0.363)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.625)
CPI (level)	0.211	-0.276	-0.462	-0.597	**-0.647**	-0.598	-0.483	-0.346	-0.219	-0.111	0.188
	(0.002)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)	(0.098)	(0.005)
CPI (growth y-o-y)	-0.038	-0.402	-0.518	**-0.552**	-0.467	-0.273	-0.009	0.228	0.379	0.431	0.241
	(0.585)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.889)	(0.001)	(0.000)	(0.000)	(0.000)
Hourly earnings (level)	0.052	-0.298	-0.347	-0.389	**-0.417**	-0.415	-0.369	-0.288	-0.187	-0.079	0.325
	(0.444)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.005)	(0.241)	(0.000)
Hourly earnings (growth y-o-y)	-0.187	-0.325	-0.253	-0.193	-0.147	-0.095	-0.005	0.107	0.219	0.307	**0.356**
	(0.006)	(0.000)	(0.000)	(0.004)	(0.029)	(0.160)	(0.943)	(0.114)	(0.001)	(0.000)	(0.000)
Official discount rate	-0.021	-0.403	**-0.468**	-0.443	-0.317	-0.121	0.073	0.219	0.278	0.247	0.001
	(0.762)	(0.000)	(0.000)	(0.000)	(0.000)	(0.069)	(0.274)	(0.001)	(0.000)	(0.000)	(0.993)
Yield on long-term government bonds	-0.038	-0.360	**-0.386**	-0.337	-0.227	-0.092	0.022	0.088	0.100	0.077	0.054
	(0.577)	(0.000)	(0.000)	(0.000)	(0.001)	(0.170)	(0.744)	(0.191)	(0.135)	(0.256)	(0.429)
Private banks' average lending rate	0.056	-0.342	-0.434	**-0.438**	-0.338	-0.163	0.016	0.140	0.175	0.128	-0.054
	(0.413)	(0.000)	(0.000)	(0.000)	(0.000)	(0.014)	(0.816)	(0.036)	(0.009)	(0.058)	(0.425)
Private banks' average deposit rate	0.069	-0.325	-0.433	**-0.446**	-0.345	-0.161	0.025	0.158	0.200	0.157	-0.067
	(0.311)	(0.000)	(0.000)	(0.000)	(0.000)	(0.015)	(0.710)	(0.018)	(0.003)	(0.020)	(0.325)
Spread between private bank's average lending and deposit rate	-0.011	**-0.205**	-0.204	-0.178	-0.132	-0.076	-0.019	0.014	0.010	-0.024	0.011
	(0.867)	(0.002)	(0.002)	(0.008)	(0.047)	(0.256)	(0.780)	(0.840)	(0.878)	(0.722)	(0.869)
Real effective krone-rate based on CPI	-0.046	-0.172	-0.250	**-0.295**	-0.279	-0.198	-0.090	0.016	0.089	0.122	0.198
	(0.498)	(0.010)	(0.000)	(0.000)	(0.000)	(0.003)	(0.180)	(0.816)	(0.187)	(0.069)	(0.003)
Share prices	-0.130	0.103	0.221	**0.287**	0.278	0.206	0.097	0.006	-0.042	-0.048	-0.105
	(0.056)	(0.125)	(0.001)	(0.000)	(0.000)	(0.002)	(0.147)	(0.934)	(0.529)	(0.479)	(0.122)
House prices	-0.221	0.146	0.275	0.367	0.416	**0.429**	0.416	0.397	0.372	0.338	0.065
	(0.001)	(0.030)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.343)
Broad money stock	0.103	0.318	0.376	**0.388**	0.338	0.226	0.072	-0.083	-0.205	-0.269	-0.173
	(0.128)	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)	(0.280)	(0.216)	(0.002)	(0.000)	(0.010)
Credit to domestic non-bank sector extended by resident banks	-0.173	-0.144	-0.067	0.043	0.164	0.271	0.329	**0.345**	0.333	0.311	0.251
	(0.011)	(0.031)	(0.318)	(0.525)	(0.014)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Bank's write-down ratio	-0.083	-0.354	**-0.359**	-0.335	-0.292	-0.235	-0.172	-0.112	-0.059	-0.014	0.130
	(0.222)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.010)	(0.094)	(0.381)	(0.840)	(0.055)

Notes: The significance probability (stated in brackets) relates to the slope parameter in an OLS-regression between the cyclical components of real GDP and the other macroeconmic variable. A constant is included. The null hypothesis is zero correlation. Bold numbers indicates peak cross-correlations in the table. All the time series - except interest rates, the unemployment rate, price and wage inflation rates and the bank's write-down ratio - have been transformed by natural logarithms before filtering. Sample: Quarterly data 1948q1-2010q2.

Source: Author's calculations, cf. the main text.

A positive contemporaneous correlation coefficient indicates that a variable is pro-cyclical while a negative contemporaneous correlation coefficient suggests that the variable is counter-cyclical. Measured by the peak correlation coefficients real private consumption and gross investments are highly pro-cyclical. This reflects the simultaneous nature of output, consumption and investments. However, the size of the cross-correlation coefficients of the lagged values of consumption (investment) and GDP are slightly higher than the cross-correlation coefficients of the leaded values of consumption (investments) and GDP. This might indicate that output tends to be driven by demand rather than vice versa, cf. also the discussion in Hansen & Knudsen (2004).

The unemployment rate is counter-cyclical and tends to lag output with one quarter measured by the peak correlation coefficient. This might reflect traditional labour hoarding effects.

CPI inflation seems to be counter-cyclical and lead output by two quarters. Following the lines of Real Business Cycle theories the negative contemporaneous correlation between inflation and output could indicate that business cycle fluctuations are dominated by supply shocks, cf. Kydland & Prescott (1990). However, the cross-correlation coefficient between inflation and real GDP becomes positive when a two-quarter lag or more of output is considered. The pattern of cross-correlations for CPI inflation could therefore also be interpreted as an indication of price stickiness as suggested by New Keynesian models, cf. King & Watson (1996).

The signs of the correlation coefficients for wage inflation correspond at all leads and lags with the signs of the cross-correlation coefficients for CPI inflation but the absolute size of the coefficients for wage inflation tend to be smaller. This could indicate that the rigidity for wages is higher than for prices.

All the four nominal interest rates tend to be counter-cyclical and seem to lead output. It is interesting to note that the official discount rate lead output by three quarters measured by the peak correlation whereas the lead time for private banks' lending and deposit rates is only two quarters. This is consistent with the findings in Carlsen & Fæste (2007) which shows that the Danish banks normally change their interest rates with a time-lag following an adjustment of the Nationalbank's discount rate.

The spread between the private bank's average lending and deposit rate seems to be counter-cyclical and leads the cycle with one year measured by the peak correlation. This reflect that interest-rate margins tend to widen in recessions where the risk of default among firms and households increases.

Share prices tend to be pro-cyclical and lead the cycle with two quarters. This is consistent with the forward-looking nature of this variable. House prices are also pro-cyclical but seem to be more closely aligned with the cycle.

Broad money seems also to be pro-cyclical and tends to lead real GDP by two quarters measured by the peak correlation. Furthermore, it seems that credit to the domestic non-financial sector is pro-cyclical and tends to lag output with two quarters. Unfortunately does the quarterly data set described in section 4 not offers a breakdown of credit by sectors. However, the lagged nature of credit might reflect that Danish firms tend to finance parts of their fixed investments in the initial stages of an upturn with own funds from retained earnings rather than loans from banks, cf. Abildgren (2009).

Finally, the bank's write-down ratio tends to be counter-cyclical and thus fall in periods with good macroeconomic performance and increase in periods with slowdown in the economy. It furthermore appears that the write-down ratio leads the cycle with three quarters. However, one must have in mind that most of the quarterly series on bank's write-down ratio is interpolated on the basis of semi-annual or annual data, cf. section 4.

6. VAR evidence on monetary transmission and shocks to financial stability

Vector autoregression (VAR) models can be used to gain further insight into business cycle dynamics, the monetary transmission mechanism and the interactions between the financial system and the real economy.

The VAR approach to the study of the monetary transmission mechanism was introduced by Sims (1972, 1980a, 1980b). Christiano *et al.* (1999) review and discuss the evidence from VAR analysis on the monetary transmission mechanism with focus on the USA whereas Peersman & Smets (2003) cover the euro area. Stock & Watson (2001) and Walsh (2010) offer non-technical summaries of the literature. The number of endogenous variables in the VAR studies on monetary transmission has usually been around 3-4.

More recently the VAR approach has also found use in relation to macroeconomic stress testing of the banking system and other studies of the robustness of the banking system to adverse macroeconomic shocks, cf. Hoggarth *et al.* (2005) and Dovern *et. al.* (2010).

VAR models might also be used to study the feedback effect on the macro economy of shocks to the robustness of the banking system, cf. Anari *et al*. (2005), Kupiec & Ramirez (2008), Marcucci & Quagliariello (2008), Österholm (2010), Monnin & Jokipii (2010), Berrospide & Edge (2010) and Puddu (2010). The stock of deposits or liabilities in failed banks, a financial condition index, the bank borrowers' default rates, the share of non-performing loans in bank's loan portfolio, the bank's write-down ratio, the bank's solvency (capital-to-assets) ratio, the return on equity in banks and the banking sector's probability of default have been used as indicators of the robustness of the banking sector. Since the dynamic interactions between the financial sector and the real economy are rich and complicated a reduced-form VAR approach seems particularly useful for studies of banking system instability due to the few *a priori* restrictions imposed on such models. The number of endogenous variables in the VAR studies mentioned above on the interactions between the macro economy and banking sector have typically been around 4-6.

This section reviews the evidence on the monetary transmission mechanism and shocks to financial stability that can be gained via orthogonalised impulse-response functions from a range of reduced form VAR models with nine endogenous variables estimated on the basis of the new historical quarterly data sets presented in section 3 and 4. The long-span data sets make it possible to estimate VAR models of a higher dimension than is usually found in the

literature due to degrees-of-freedom problems. The analysis complements a number of earlier studies on the monetary transmission mechanism in Denmark, in particular the study by Sløk (1997) using reduced form stationary VAR analysis based on quarterly data 1972-1994. Beier & Storgaard (2006) contains a more recent and detailed study on the monetary transmission mechanism in Denmark following a structural stationary VAR approach based on monthly data 1983-2005. However, none of these Danish studies have included asset prices, credit, money and the bank's write down ratio among the endogenous variables.

Model specification issues

An unrestricted reduced form VAR model can in general terms be written as:

$$[6]\ Y_t = A_1 Y_{t-1} + ... + A_p Y_{t-p} + E_t$$

where Y_t is a Kx1vector of endogenous variables, A_i (i=1,...,p) are KxK coefficient matrices and E_t is a Kx1 vector of serially uncorrelated error terms with zero means and a time-independent variance-covariance matrix V. Exogenous variables and deterministic terms such as constant terms, linear time trends and seasonal dummy variables can be included on the right-hand side of equation [6] but has been left out in order to simplify the exposition.

Since the right hand side of [6] only contains predetermined variables, simultaneity is not an issue. Furthermore, since all the equations have the same explanatory variables, the coefficients can be estimated efficiently by use of OLS directly to each equation in the VAR. The variance-covariance matrix V of the reduced form error terms can then be estimated from the residuals.

Once the A_i coefficients are estimated the marginal effect on the system at time t, t+1, t+2, ... of a shock to one of the endogenous variables at time t can be traced out from [6]. Such effects are usually termed "impulse responses" since they measure the marginal response of Y_t at time t, t+1, t+2, ... to a unit change at time t in one of the reduced form error terms in E_t.

However, if the variance-covariance matrix V is not diagonal a unit change at time t in only one of the reduced form error terms in E_t is implausible. The reduced form error terms can be seen as linear combinations of "structural" shocks, i.e. shocks that occur to each endogenous variable in isolation. A common way to identify such "structural" (or "orthogonal") shocks is based on a Cholesky decomposition of V. Since V is assumed to be symmetric and positive definite it can be uniquely decomposed as $V = LL^T$, where ^{T} denotes transponation and L is a KxK lower triangular matrix with zeros above the diagonal. The reduced form error terms in E_t can then be written as $E_t = LU_t$, where U_t is a Kx1 vector of structural shocks which are contemporaneously uncorrelated and have a unit variance, i.e. the variance-covariance matrix of U_t is an identity matrix. If U^j denotes a Kx1 vector with one in row j and zeros elsewhere,

the impulse-responses to a one standard error structural shock to the endogenous variable no. j can then be traced out from LU^j and the estimated A_i coefficients in [6]. These impulse responses are typically denoted "orthogonalised impulse responses".

Since L is lower triangular a structural shock to the first endogenous variable at time t will also have an instantaneous effect on all the other endogenous variables in the system. A structural shock to the second endogenous variable at time t will not have any effect at time t on the first endogenous variable but only on the other endogenous variable, *etc*. The effect of a structural shock to one of the endogenous variables in the system thus depends on ordering of the endogenous variables in Y_t. This complicates the economic interpretation of the orthogonalised impulse-responses based on a Cholesky decomposition of V. However, a reasonable ordering might be based on economic arguments. Furthermore, the robustness of the ordering can be assessed by estimating models with different ordering of the endogenous variables.[9]

A final issue to consider is whether all the variables in the VAR need to be (trend) stationary or whether non-stationary variables can be included. Sims *et al*. (1990), Hamilton (1994: 651-652) and Enders (2004:270) notes that the parameters describing the systems dynamics and hence impulse responses are still estimated consistently in a VAR in levels even in the case when some or all of the variables are non-stationarity. Furthermore, many test statistics still have the same asymptotic distribution as in the stationary case. A VAR in levels allows for implicit cointegration among the variables and it might be argued that trending variables or deterministic trends could approximate unit roots with drift. A VAR in differences could be an alternative option to a VAR in levels. However, differencing throws away information and a VAR in differences is misspecified if some of the variables in levels in fact are stationary or cointegrated. A robustness check of the order of integration of the variables in the VAR can be performed by estimating the system in levels as well as in first differences.

In the paper at hand a range of reduced-form VAR models are estimated using quarterly data for the period 1948q1-2010q2.[10] All the models contain the same nine endogenous variables (real GDP, CPI, discount rate, yield on long-term central-government bonds, share prices, broad money, domestic credit, house prices and the bank's write-down ratio), and the estimated impulse-responses are orthogonalised based on a Cholesky decompositions.

Table 4 shows the result of a range of Augmented Dickey Fuller (ADF) unit-root tests for the nine variables in levels and first differences. All tests include a constant, and for variables in levels a trend is included as well. Seasonal dummies are included for non-seasonally

[9] The econometrics of VAR models and impulse-response analysis is e.g. covered by Hamilton (1994), Krätzig & Lütkepohl (eds.) (2004) and DeJong & Dave (2007).

adjusted series with a seasonal pattern.[11] ADF tests are known to be sensible to the choice of lag length for differences included in the test. The lag length in the tests has been chosen with the aim of ensuring no significant signs of autocorrelation in the residuals at a 5 per cent significance level.

At a 5 per cent significance level the ADF-tests in Table 4 suggest that all variables in levels are generated from non-stationary processes whereas all variables in differences are stationary. ADF test usually serves as the starting point or "benchmark" in unit-root testing. However, it should be noted that the power of ADF tests against the null hypothesis of a unit root is not very strong. A null hypothesis is always accepted unless there is strong evidence against it. One the other hand, if the null hypothesis of non-stationarity in an ADF test is rejected, there is a strong case for stationarity. Alternative tests with stationarity as the null hypothesis have been developed. However, in light of the test results in Table 4 it seems suitable - as a robustness test - to estimate the VAR models both in levels and in first differences.

Table 4 Univariate unit-root tests

	Augmented Dickey Fuller tests				
	Null hypothesis: The presence of a unit root				
	Constant?	Trend?	Seasonal dummies ?	Number of lags for differences	Test statistics
Levels:					
Real GDP (log-level, NSA)	yes	yes	yes	4	-0.63
CPI (log-level, NSA)	yes	yes	yes	4	-0.47
Discount rate (level, NSA)	yes	yes	no	4	-1.73
Yield on long-term central-government bonds (level, NSA)	yes	yes	no	4	-1.09
Share prices (log-level, NSA)	yes	yes	no	1	-3.16
Broad money (log-level, NSA)	yes	yes	yes	5	-0.76
Domestic credit (log-level, NSA)	yes	yes	yes	5	-1.20
House prices (log-level, NSA)	yes	yes	no	5	-1.63
Bank's write-down ratio (level, NSA)	yes	yes	no	5	-3.19
Differences:					
Real GDP (dlog_1, SA)	yes	no	no	0	-19.03**
CPI (dlog_1, SA)	yes	no	no	5	-3.44*
Discount rate (d_1, NSA)	yes	no	no	3	-8.60**
Yield on long-term central-government bonds (d_1, NSA)	yes	no	no	3	-8.85**
Share prices (dlog_1, NSA)	yes	no	no	0	-11.62**
Broad money (dlog_1, SA)	yes	no	no	2	-5.56**
Domestic credit (dlog_1, SA)	yes	no	no	1	-3.85*
House prices (dlog_1, NSA)	yes	no	no	4	-5.19**
Bank's write-down ratio (d_1, NSA)	yes	no	no	4	-6.67**

General notes: Sample: Quarterly data 1948q1-2010q2.
NSA denotes no seasonally adjustment whereas SA denotes seasonally adjustment.
d_1 denotes first differences whereas dlog_1 denotes first logarithmic differences.
* (**) denotes rejection of the null hypothesis at a 5-per-cent (1-per-cent) significance level.

In the following three different reduced-form VAR models are therefore estimated, cf. Table 5. In model L and model LA all time series are non-seasonally adjusted and are in log-levels except interest rates and bank's write-down ratio, which are in levels. Furthermore,

[10] All econometric results presented in this section have been obtained via the use of PCGive and JMulTi.

constant terms, linear time trends and seasonal dummy variables are included in these two models.

In model L, the financial and monetary variables as well as the bank's write-down ratio are ordered at the end, which implies that these variables are assumed to respond immediately to shocks to the real economy and to monetary policy. Output and consumer prices are placed at the beginning, which implies a lagged reaction of these variables to monetary and financial shocks. The ordering in model L implies e.g. that a shock to the discount rate has no contemporaneous effect on output and prices but might effect the yield on long-term bonds and house prices immediately.

Table 5: Specifications of three VAR models. Estimated on the basis of quarterly data 1948q1-2010q2

Model	L (Levels)	LA (Levels, Alternative ordering)	D (Differences)
Endogenous variables listed in order	1. Real GDP (log-level, NSA) 2. CPI (log-level, NSA) 3. Discount rate (level, NSA) 4. Yield on long-term central-government bonds (level, NSA) 5. Share prices (log-level, NSA) 6. Broad money (log-level, NSA) 7. Domestic credit (log-level, NSA) 8. House prices (log-level, NSA) 9. Bank's write-down ratio (level, NSA)	1. Discount rate (level, NSA) 2. Yield on long-term central-government bonds (level, NSA) 3. Share prices (log-level, NSA) 4. Broad money (log-level, NSA) 5. Domestic credit (log-level, NSA) 6. House prices (log-level, NSA) 7. Bank's write-down ratio (level, NSA) 8. Real GDP (log-level, NSA) 9. CPI (log-level, NSA)	1. Real GDP (dlog_1, SA) 2. CPI (dlog_1, SA) 3. Discount rate (d_1, NSA) 4. Yield on long-term central-government bonds (d_1, NSA) 5. Share prices (dlog_1, NSA) 6. Broad money (dlog_1, SA) 7. Domestic credit (dlog_1, SA) 8. House prices (dlog_1, NSA) 9. Bank's write-down ratio (d_1, NSA)
Deterministic terms	Constant terms Linear time trends Seasonal dummies	Constant terms Linear time trends Seasonal dummies	Constant terms
Optimal endogenous lags from AIC (a)	5	5	4
Chosen number of endogenous lags	5	5	6
Vector F-tests for auto-correlation (p-value) (b)	0.2553	0.2580	0.2602

General notes: NSA denotes no seasonally adjustment whereas SA denotes seasonally adjustment. d_1 denotes first differences whereas dlog_1 denotes first logarithmic differences.

(a) Among models with a maximum of 10 endogenous lags.

(b) Up to the chosen number of lags in the models. Null hypothesis is no autocorrelation.

Model LA is almost identical to model L but contains an alternative ordering of the variables. In model LA output and prices are placed at the end whereas the ordering of the other variables follows the ordering from model L. Model LA serves as a robustness test of the orthogonalisation in model L.

In model D all time series are seasonally adjusted except interest rates, asset prices and bank's write-down ratio, which are non-seasonally adjusted. Furthermore, all time series in

[11] No seasonal patterns were found for interest rates, share prices, house prices and the bank's write-down ratio. The seasonal assessment was carried out with X-12-ARIMA, cf. U.S. Census Bureau (2009).

this model are in first logarithmic differences except interest rates and bank's write-down ratio, which are in first differences and not transformed by the natural logarithm function. Constant terms are included in model D and the ordering of the variables in model D correspond to that in model L. Model D serves as a robustness check on the order of integration of the variables in model L. The estimated impulse-responses in model D are accumulated in order to facilitate comparisons of the results with those from the corresponding model in levels (i.e. model L).

The number of lags in all the three VAR-models has been guided by the Akaike Information Criterion (AIC) compiled for models with a maximum of 10 endogenous lags. However, the actual lag length has been chosen based on vector diagnostics for autocorrelation in order to ensure no signs of autocorrelation in the residuals at a five per cent significance level.

Responses to a monetary-policy shock

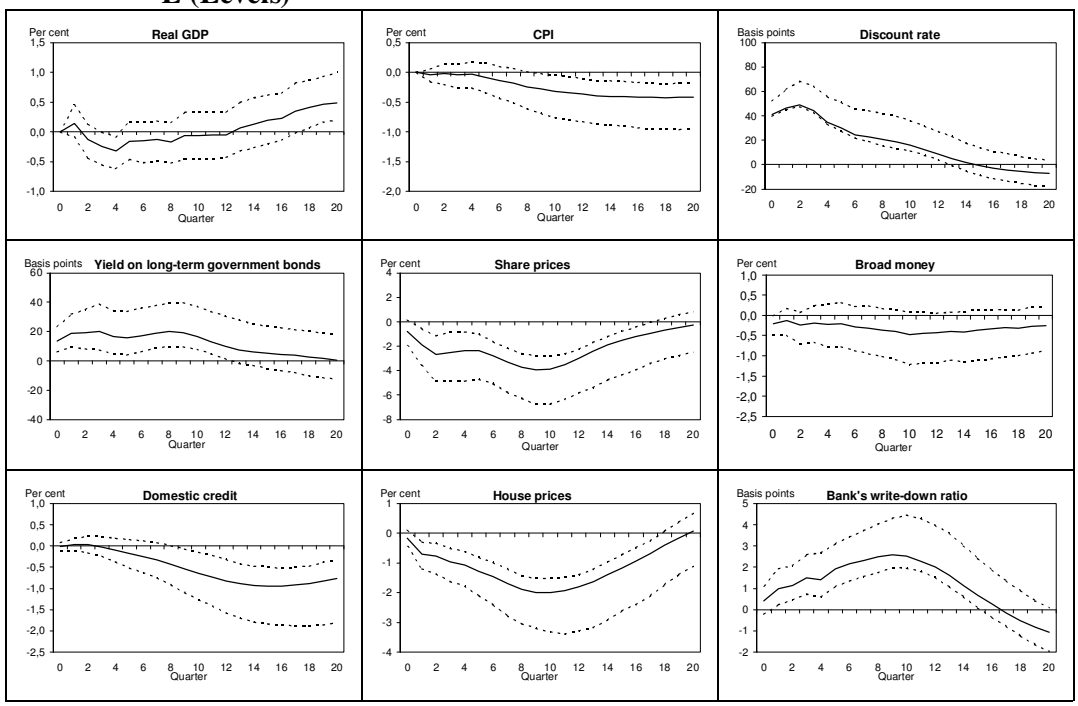
The thick lines in Chart 22 shows the estimated responses to an unexpected (exogenous) shock to the nominal discount rate derived from model L. The shape and direction of the impulse-response functions seems in general to be in line with what one could expect from mainstream macroeconomic theory.

After the shock the discount rate gradually converge back to the baseline level. The yield on long-term central-government bonds rises significantly following the shock but less than the increase in the discount rate. The pattern of the long-term interest rate is consistent with the expectation theory of the term structure, according to which the long-term interest rate is an average of the expected future short-term interest rates (plus a risk premuim).

Asset prices drop significantly during the first couple of years after the interest-rate shock before they begin a sluggish reversion towards the baseline levels. This is in line with a discounted dividend model for share prices and a model for house prices based on discounted future imputed rents.

Real GDP falls after the shock to the discount rate and reaches a minimum after one year before reverting back towards the baseline level. The initial drop in output may e.g. reflect intertemporal substitution in consumption and lower investment due to the fall in asset prices (cf. Tobins Q).

Chart 22: Responses to a one standard error shock to the discount rate - Model L (Levels)



General notes: Dashed lines are 95 per cent bootstrapped confidence intervals calculated using 500 repetitions of Hall's percentile method. The orthogonalised impulse-response functions show deviations from the underlying baseline in per cent, except for interest rates and the bank's write-down ratio, which show derivations from the baseline in basis points. Sample: Quarterly data 1948q1-2010q2.

The CPI decline significantly after a couple of years following the shock to the discount rate. The effect on the price level seems to be very persistent which might indicate price stickiness. It might also be noted that the so-called "price puzzle" known from the VAR literature - cf. e.g. Christiano *et al.* (1999) - where an increase in the short-term interest rate followed initially by an increase in the price level, seems not to be an issue in Chart 22.

After a couple of years there seems to be a significant and persistent decline in credit following the shock to the discount rate. This could reflect the persistent reductions in house prices. Falling house prices are usually followed by a reduction in the demand for loans when existing houses are traded at new and lower price levels. Furthermore, a decline in house prices may reduce the borrowing for other purposes than house acquisition by lowering the equity that potentially can be posed as collateral.

There seems not to be any significant reaction of broad money to shock to the discount rate. This might reflect a combination of several factors. The higher short-term interest rate makes money more attractive, but the increase in the long-term interest rate as well as a lower transaction level indicated by the decline in real GDP reduce the demand for money.

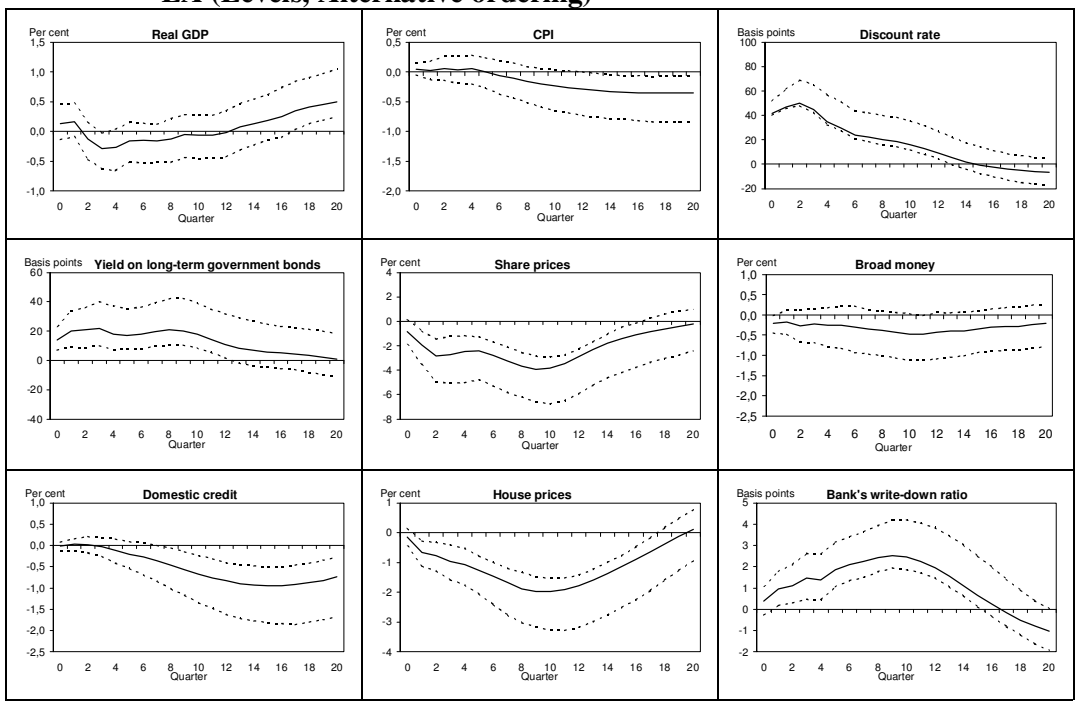
Finally it seems that a shock to the short-term interest rate tend to be followed by a significant increase in the bank's write-down ratio up to three years after the shock. This

might reflect that the decline in real GDP and asset prices and the increase in the interest rate level deteriorate the credit quality of the bank's customers.

Robustness checks

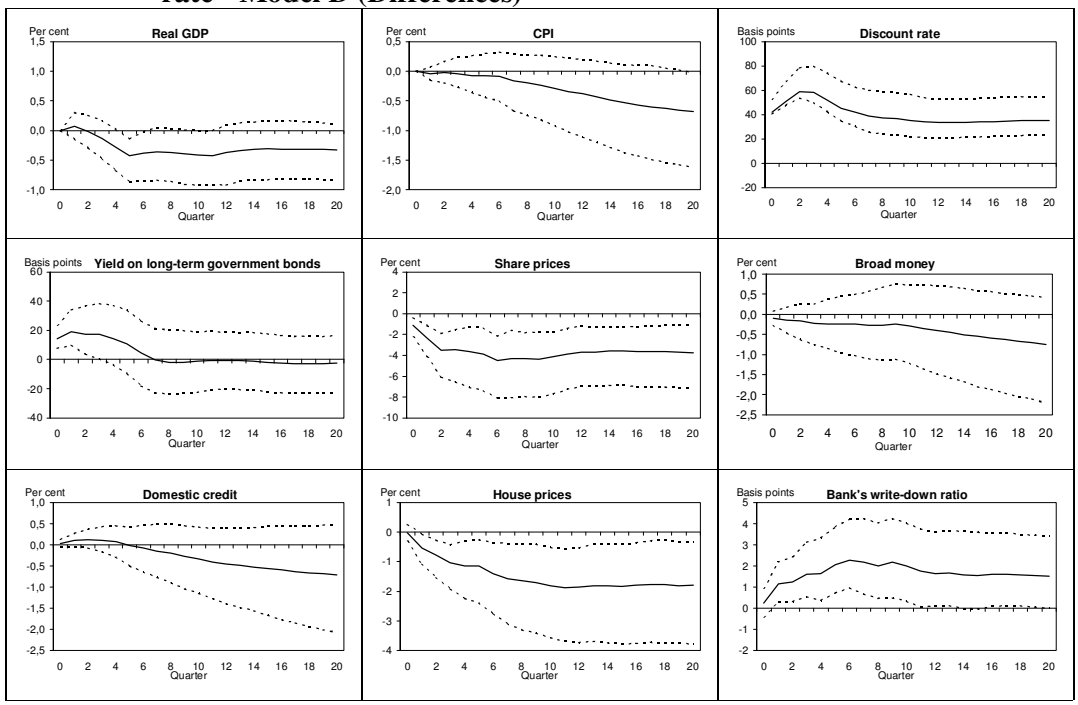
As a robustness test of the ordering and stationarity of the variables in model L, Chart 23-24 reports the estimated responses to a shock to the discount rate derived from model LA and model D. In broad terms, the responses in the three models are similar in direction, shape and magnitude.

Chart 23: Responses to a one standard error shock to the discount rate - Model LA (Levels, Alternative ordering)



General notes: Dashed lines are 95 per cent bootstrapped confidence intervals calculated using 500 repetitions of Hall's percentile method. The orthogonalised impulse-response functions show deviations from the underlying baseline in per cent, except for interest rates and the bank's write-down ratio, which show derivations from the baseline in basis points. Sample: Quarterly data 1948q1-2010q2.

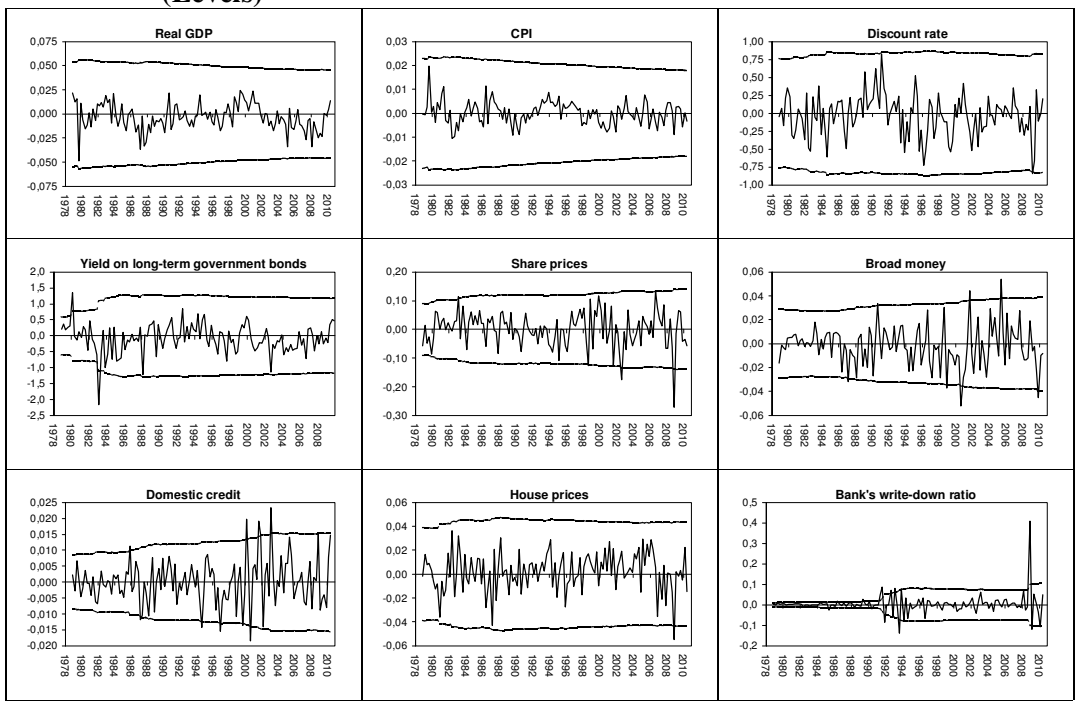
Chart 24: Accumulated responses to a one standard error shock to the discount rate - Model D (Differences)



General notes: Dashed lines are 95 per cent bootstrapped confidence intervals calculated using 500 repetitions of Hall's percentile method. The accumulated orthogonalised impulse-response functions show accumulated deviations from the underlying baseline in per cent, except for interest rates and the bank's write-down ratio, which show accumulated derivations from the baseline in basis points. Sample: Quarterly data 1948q1-2010q2.

Chart 25 shows one-step-ahead prediction errors (also known as "one-step recursive residuals") for the nine equations in model L. The figure shows how the one-quarter-ahead forecast error in each equation changes when new observations are added recursively to the estimation sample. Residuals outside the standard error bands can be taken as an indicator of outliers or parameter instability. For all the equations most of the prediction errors stay inside the 95 per cent confidence bounds. Overall the prediction errors do not indicate signs of structural change or parameter instability although a few outliers seem to be present.

Chart 25: One-step-ahead prediction errors for the equations in model L (Levels)



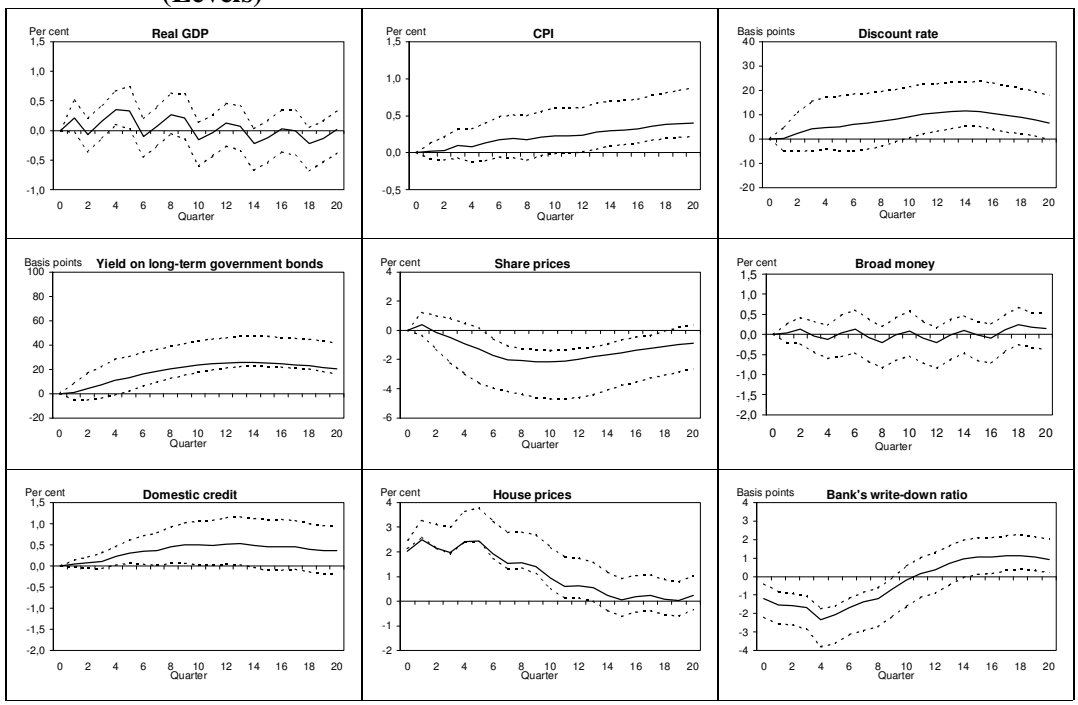
General notes: Dashed lines are 95 per cent confidence intervals. Sample: Quarterly data 1948q1-2010q2. 118 observations have been used for initialisation.

As mentioned in section 3 the pre-1971 quarterly national-account data were constructed using least-squares interpolation algorithms and an information set consisting of a range of quarterly indicator series and annual national account data. Furthermore, as mentioned in section 4 most of the quarterly data on bank's write-down ratio have been interpolated from semi-annual or annual data. As a further robustness test the three models in Table 5 have therefore also been estimated on annual data 1948-2009, cf. annex D. Overall, the response of the annual systems to a one-standard-error structural shock to the discount rate are similar in direction, shape and magnitude to the findings based on the quarterly models described above.

Responses to shocks to house prices and the long-term interest rate

Chart 26 explores the dynamics following a shock to nominal house prises. An increase in house prices is followed by a significant and rather persistent decline in the banking sector's write-down ratio. The jagged response of e.g. real GDP and broad money reflects that the model is based on non-seasonally adjusted data, cf. Table 5.

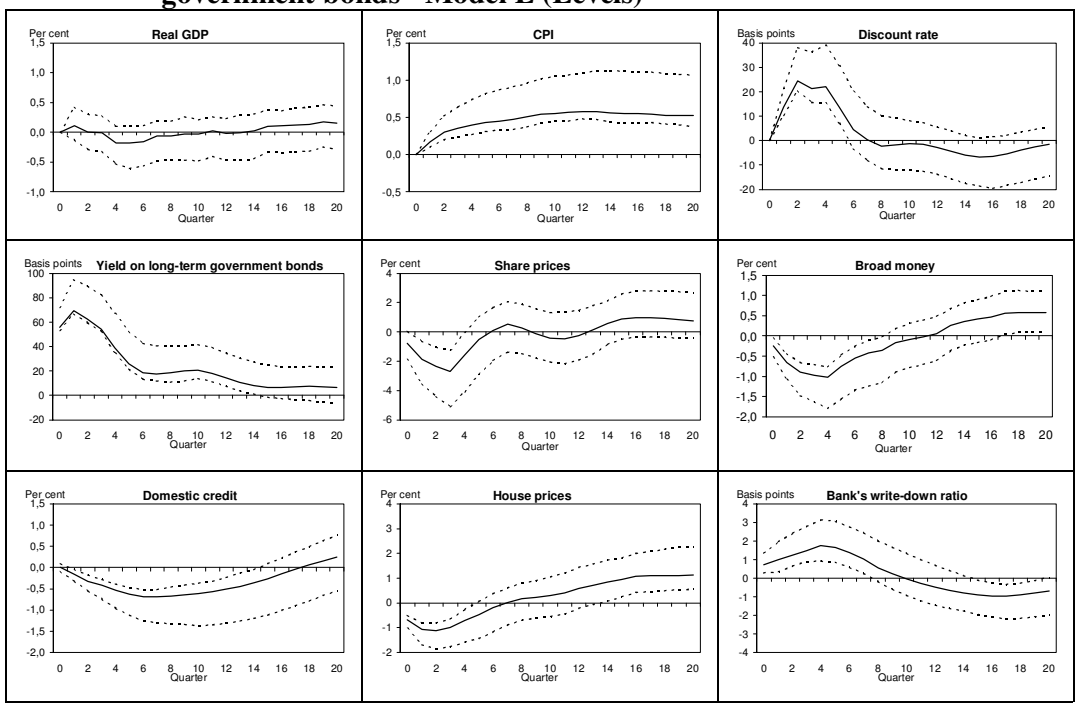
Chart 26: Responses to a one standard error shock to house prices - Model L (Levels)



General notes: Dashed lines are 95 per cent bootstrapped confidence intervals calculated using 500 repetitions of Hall's percentile method. The orthogonalised impulse-response functions show deviations from the underlying baseline in per cent, except for interest rates and the bank's write-down ratio, which show derivations from the baseline in basis points. Sample: Quarterly data 1948q1-2010q2.

The responses to a shock to the nominal long-term interest rate are shown in Chart 27. An increase in the long-term interest rate is followed by a significant increase in the banking sector's write-down ratio. The responses of output and prices - no significant effect on real GDP and a gradual and significant increase in the price level - might at first seem surprising. The most obvious explanation is that the shock to the nominal long-term interest rate should be interpreted as a shock to the expected inflation rate or the inflation risk-premium rather than a shock to the expected real interest rate, cf. also the historical development of inflation and the nominal long-term interest rate in Denmark in section 4.

Chart 27: Responses to a one standard error shock to the yield on long-term government bonds - Model L (Levels)

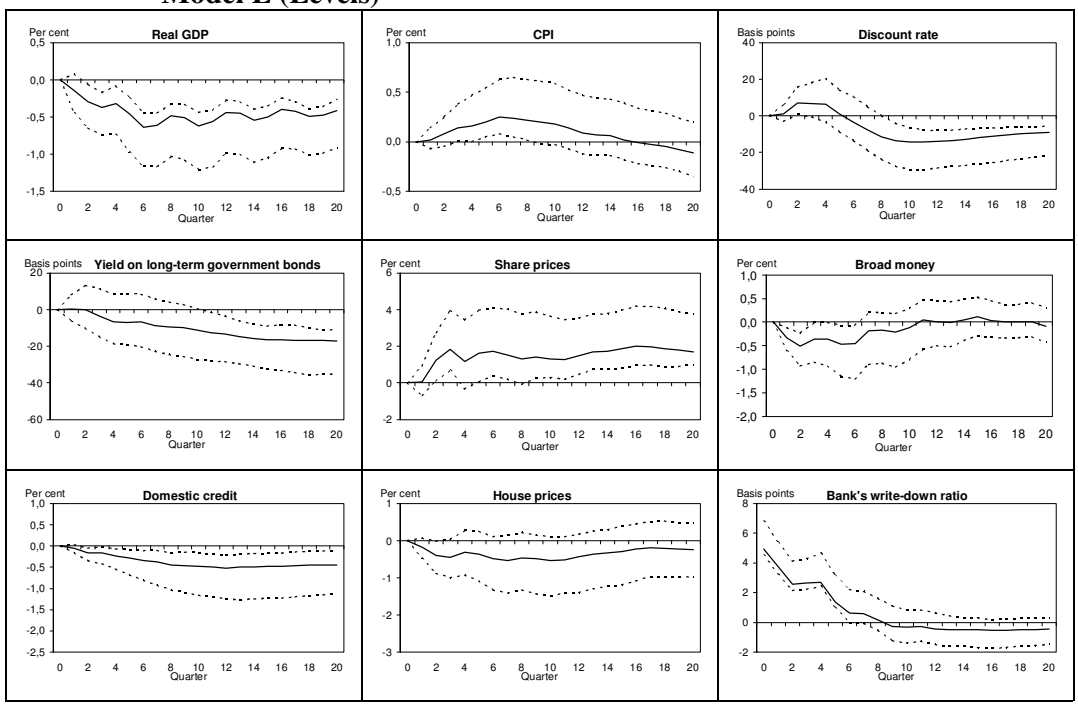


General notes: Dashed lines are 95 per cent bootstrapped confidence intervals calculated using 500 repetitions of Hall's percentile method. The orthogonalised impulse-response functions show deviations from the underlying baseline in per cent, except for interest rates and the bank's write-down ratio, which show derivations from the baseline in basis points. Sample: Quarterly data 1948q1-2010q2.

Responses to a shock to the bank's write-down ratio

Finally, Chart 28 suggests that there are feedback effects from shocks to the banking sector to the real economy. A shock to the bank's write-down ratio - which might be interpreted as a sudden reassessment of the credit quality of the bank's loan portfolio or an increase in the banking sectors' risk aversion - has a significant and long-lasting negative effect on domestic credit and real GDP. There thus seems to be a link between financial stability and macroeconomic performance. The link might indicate the existence of a bank-lending channel. According to such a line of thinking a shock to the bank's capital is followed by a period of reduced loan supply in order to maintain or re-establish a sufficient capital ratio, and the reduced credit supply affects the other parts of the macroeconomic system. The negative and persistent impact on real GDP after a shock to the banking sector's write-down ratio is consistent with the findings in the literature that economic recoveries after banking and financial crises are slower than normal, cf. e.g. Bordo *et al.* (2001) and Reinhart & Reinhart (2010).

Chart 28: Responses to a one standard error shock to bank's write-down ratio - Model L (Levels)



General notes: Dashed lines are 95 per cent bootstrapped confidence intervals calculated using 500 repetitions of Hall's percentile method. The orthogonalised impulse-response functions show deviations from the underlying baseline in per cent, except for interest rates and the bank's write-down ratio, which show derivations from the baseline in basis points. Sample: Quarterly data 1948q1-2010q2.

7. Final remarks and scope for further research

Official quarterly national accounts for Denmark are only available for the period since 1977. This paper has presented a first attempt to overcome this data shortage by constructing a set of summary quarterly national-account data for Denmark covering the period since 1948. The long-span data sets has made it possible to estimate VAR models of a higher dimension than is usually found in the literature due to degrees-of-freedom problems. The estimated responses to the shocks presented in the paper seem plausible and most of the responses are clearly significant at 5 per cent levels. This illustrates the usefulness of long-span data sets when the rich and complicated dynamic interactions between the financial sector and the real economy are subject to study.

However, the quarterly national-account data presented in this paper should only be considered as a first attempt to close some of the gaps in the existing stock of historical statistics in Denmark. It could be useful if the data set on quarterly national accounts could be disaggregated somewhat further, for instance with a breakdown of private consumption into durables and non-durables and a drill-down of gross investment into sub-categories. Furthermore, in general it would be preferable if the quarterly data could be based on a larger

set of indicators than the figures presented in section 3. Until now projects on historical national accounts in Denmark have only focused on annual data.[12] It would be interesting if future projects on historical-national accounts statistics in Denmark would make an attempt to cover quarterly data as well.

Also the supplementary quarterly data set in section 4 could benefit from further work. It would be useful with quarterly data on employment and time series for public finances, at least for the central government. It would also be interesting with a drill down of domestic credit into commercial credit and credit to private individuals. Furthermore, as mentioned in section 3 most of the quarterly data on the bank's write-down ratio have been interpolated from semi-annual or annual data. Even though the bank's write-down ratio is rather persistent in nature it could improve the quality of this data series if more quarterly information could be uncovered.

The analysis of the stylised empirical evidence on the business cycle, the monetary transmission mechanism and shocks to financial stability presented in this paper have only been of an explorative nature. The data sets in section 3 and 4 could be subject to further and more comprehensive studies. In Denmark there is no recognised business cycle dating committee. The stylised facts on the business cycle in section 5 could therefore be elaborated by an attempt to identify peaks and troughs in the Danish business cycle since 1948. Another natural next step could be exploration of the robustness of the findings in section 6 within the framework of cointegrated or structural VAR models.

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[12] For an overview of the available historical national-accounts figures in Denmark, cf. pp. 164-179 in Mogensen (1987), Hyldtoft (1993, 1994), Christensen *et al.* (1995) and Nilsson (1991, 2004).

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Annex A: Data sources

National accounts statistics, annual data 1948-1971
Sources:

Various issues of Statistics Denmark, *Statistiske Efterretninger*; and Statistics Denmark, *Statistical ten-year review*. Other sources: Statistics Denmark (1966).

Comments:

(1) Figures in constant prices are based on 1955-prices.

National accounts statistics (non-seasonally adjusted), quarterly data 1971q1-1977q4
Sources:

The MONA database (cf. Danmarks Nationalbank, 2003) and Statistics Denmark, *StatBank Denmark*.

(1) The non-seasonally adjusted data been compiled on the basis of seasonally adjusted data and seasonal factors from 1977. (2) Figures in constant prices are based on 2000-prices (chain figures).

National accounts statistics (non-seasonally adjusted), quarterly data 1977q1-2010q2
Sources:

Statistics Denmark, *StatBank Denmark*.

Comments:

(1) Adjusted for break in series in 1988 and 1990. (2) Figures in constant prices are based on 1995-prices (1988-1990) and 2000-prices (1991-2010).

Value index for retail sales, quarterly data 1948q1-1971q4
Sources:

Various issues of Statistics Denmark, *Statistical Yearbook*.

Comments:

(1) Adjusted for break in series in 1955, 1961 and 1968.

Consumer price index, Denmark, quarterly data 1948q1-2010q2
Sources:

Various issues of Statistics Denmark, *Statistiske Efterretninger*; and Statistics Denmark, *Statistical Yearbook*.

Comments:

(1) Adjusted for break in series in 1956, 1965, 1976, 1981 and 2000.

Number of new registrations of passenger cars etc., quarterly data 1948q1-1971q4
Sources:

Various issues of Statistics Denmark, *Statistiske Efterretninger*; and Statistics Denmark, *Konjunkturoversigt*;

Comments:

(1) Adjusted for break in series in 1949 and 1955.

Number of dwellings started, quarterly data 1948q1-1971q4
Sources:

Various issues of Statistics Denmark, *Statistiske Efterretninger*; and Statistics Denmark, *Statistical Yearbook.*

Comments:

(1) 1969-1971: Quarterly data for the number of dwellings started in all of Denmark. (2) For the period 1949-1968 are the quarterly data estimated on the basis of semiannual data for the number of dwellings started in all of Denmark and quarterly data for the number of dwellings started in towns *etc.* with more than 1000 inhabitants. During the period 1949-1968 the number of dwellings started in towns *etc.* with more than 1000 inhabitants covered 75-87 per cent of the number of dwellings started in all of Denmark. (3) For 1948 are the quarterly data estimated on the basis of the development in quarterly data for the number of dwellings started in town *etc.* with more than 1000 inhabitants. (4) Adjusted for break in series 1949 and 1969.

Index of building costs, quarterly data 1948q1-1971q4
Sources:

Various issues of Statistics Denmark, *Statistical Yearbook.*

Comments:

(1) 1968-1971: Index of building costs for a single-family house. 1949-1967: Index of building costs for a residential building. 1948: index of building costs of a 3-storeyed building.

(2) Adjusted for break in series in 1949, 1955 and 1968.

Gross floor space (m2) of new buildings started excluding dwellings started, quarterly data 1948q1-1971q4

Sources:

Various issues of Statistics Denmark, *Statistiske Efterretninger*; and Statistics Denmark, *Statistical Yearbook.*

Comments:

(1) Quarterly figures for gross floor space of new dwellings started is calculated on the basis of gross floor space of new dwellings started in 1948 and the development in the number of dwellings started on a quarterly basis in the period 1948-1971. (2) Adjusted for break in series in 1949, 1963 and 1968.

Number of new registrations of commercial vehicles, quarterly data 1948q1-1971q4

Sources:

Various issues of Statistics Denmark, *Statistiske Efterretninger*; Statistics Denmark, *Konjunkturoversigt*; and Statistics Denmark, *Statistical Yearbook*.

Wholesale price index, quarterly data 1948q1-1971q4

Sources:

Various issues of Statistics Denmark, *Statistical Yearbook*; and IMF, *International Financial Statistics*.

Comments:

(1) Adjusted for break in series in 1955, 1956 and 1968.

Value of exports and imports of goods, quarterly data 1948q1-1971q4

Sources:

Various issues of Statistics Denmark, *Statistical Yearbook.*

Comments:

(1) 1948-1956: Special trade. 1957-1971: General trade. (2) Adjusted for break in series in 1957.

Index of unit values in exports and imports of goods, quarterly data 1948q1-1971q4

Sources:

Various issues of Statistics Denmark, *Statistical Yearbook.*

Comments:

(1) Excluding ships and aeroplanes. (2) Adjusted for break in series in 1949, 1956, 1966 and 1971.

Value of exports and imports of services, quarterly data 1948q1-1971q4
Sources:

Various issues of Danmarks Nationalbank, *Annual Report and Accounts*; and Statistics Denmark, *Statistical Yearbook*. Other sources: Thygesen (1971).

Comments:

(1) Quarterly data for the value of exports and imports of services are only available from 1960. Prior to 1960 the figures are interpolated based on the development in the value of exports and imports of goods.

Unemployment rate, quarterly data 1948q1-2010q2
Sources:

Various issues of: Statistics Denmark, *Statistical ten-year review*. Other sources: Statistics Denmark (1996); and Statistics Denmark, *StatBank Denmark*.

Comments:

(1) Unemployed persons in per cent of the total labour force. (2) For the period 1966-1972 calculated on the basis of annual data for unemployed persons in per cent of the total labour force and quarterly data for unemployed persons in per cent of wage earners in the labour force (3) For the period 1948-1965 calculated on the basis of annual data for unemployed persons in per cent of the total labour force 1949-1965 and quarterly data for unemployed members of unemployment insurance funds in per cent of the total number of members of unemployment insurance funds 1948-1965. (4) Adjusted for break in series in 1949, 1957, 1966, 1973, 1980 and 2000.

Index of average hourly earnings in manufacturing industries, quarterly data 1948q1-2010q2
Sources:

Various issues of: Statistics Denmark, *Statistical Yearbook*. Other sources: Statistics Denmark, *StatBank Denmark*.

Comments:

(1) Adjusted for break in series in 1970, 1973, 1996 and 2007.

Official discount rate of Danmarks Nationalbank, quarterly data 1948q1-2010q2
Sources:

Various issues of: Danmarks Nationalbank, *Report and Accounts*. Other sources: Mordhorst (1968); and Danmarks Nationalbank's website (www.nationalbanken.dk).

Comments:

(1) Quarterly averages of daily observations.

Yield on long-term Danish government bonds, quarterly data 1948q1-2010q2

Sources:

Various issues of: Danmarks Nationalbank, *Monetary Review*; and Danmarks Nationalbank, *Report and Accounts*. Other sources: Danmarks Nationalbank's website (www.nationalbanken.dk); Statistics Denmark (1969) and internal material from Danmarks Nationalbank.

Comments:

(1) 1983q3-2010q2: Yield to maturity on 10-year central government bonds. 1948q1-1983q2: Yield to maturity on long central government bonds. (2) 1960-2010: Quarterly averages of daily observations. 1948-1959: The quarterly figures refer to 15 March, 15 June, 15 September and 15 December.

Private banks' average lending rate, quarterly data 1948q1-2010q2

Sources:

Various issues of: Danmarks Nationalbank, *Report and Accounts*; and Statistics Denmark, *Statistical Yearbook*. Other sources: Carlsen & Fæste (2007); Mikkelsen (1993); Pedersen (1989); Thygesen (1971); and Danmarks Nationalbank's website (www.nationalbanken.dk).

Comments:

(1) Quarterly data for the weighted average lending interest rates of savings banks and commercial banks are only available for the period 1973-2010. For the period 1969-1972 the quarterly data are based on annual data on the weighted average lending interest rates of savings banks and commercial banks and quarterly data for the average lending rate charged by the main commercial banks. For the period 1951-1968 are the quarterly data based on annual data on the weighted average lending interest rates of savings banks and commercial banks and quarterly data for the rate charged by commercial banks on cash credits. For the period 1948-1950 the quarterly data are based on annual data on the weighted average lending interest rates of savings banks and commercial banks and quarterly data for the average lending rate charged by the main commercial banks. (2) Adjusted for break in series in 1948, 1951, 1969, 1973, 1976 and 1983.

Private banks' average deposit rate, quarterly data 1948q1-2010q2

Sources:

Various issues of: Danmarks Nationalbank, *Report and Accounts*; and Statistics Denmark, *Statistical Yearbook*. Other sources: Carlsen & Fæste (2007); Mikkelsen (1993); Pedersen (1989); Thygesen (1971); and Danmarks Nationalbank's website (www.nationalbanken.dk).

Comments:

(1) Quarterly data for the weighted average deposit interest rates of savings banks and commercial banks are only available for the period 1973-2010. For the period 1969-1972 the quarterly data are based on annual data on the marginal between the weighted average lending and deposits rates of savings banks and commercial banks and quarterly data for the private banks' average lending rate. For the period 1951-1968 based on quarterly data on the marginal between the weighted average lending and deposits rates of commercial banks and quarterly data for the private banks' average lending rate. For the period 1948-1950 the quarterly data are based on annual data on the weighted average deposit interest rates of savings banks and commercial banks (2) Adjusted for break in series in 1951, 1969, 1976 and 1983.

Nominal effective krone-rate index, quarterly data 1948q1-2010q2

Sources:

Various issues of: Danmarks Nationalbank, *Report and Accounts*; and Danmarks Nationalbank, *Monetary Review*. Other sources: Danmarks Nationalbank's website (www.nationalbanken.dk), Pedersen, E. H. (1996), Statistics Denmark (1995) and Ølgaard (1992).

Comments:

(1) Trade-weighted average of the development in the bilateral nominal krone-rate vis-à-vis the currencies of a range of Denmark's main trading partners. An increase in the index describes an overall nominal appreciation of the Danish krone vis-à-vis the currencies of Denmark's main trading partners. (2) Quarterly averages. (3) 1970-2010: Based on the official nominal effective krone-rate index published by the Nationalbank. The index has been compiled by weighting (geometrically) the development in indices for the bilateral value of one krone vis-à-vis the currency range of different countries. The weights used in the index are based on so-called double-weighted export weights and bilateral import weights. For the period from 8 April 2010 to June 2010 the official nominal effective krone-rate index is based on weights calculated from 2009 trade statistics (covering trade with 27 countries). For the period from 1 October 2004 to 7 April 2010 the official nominal effective krone-rate index is based on weights calculated from 2002 trade statistics (covering trade with 27 countries). The

weights from the period 30 May 1997 to 30 September 2004 are based on 1995 trade statistics (25 countries). For the period from 1 January 1992 to 29 May 1997 the weights are based on 1989 trade statistics (21 countries). For 1970-1991 the weights are based on 1983 trade statistics (17 countries). (4) No official quarterly nominal effective krone-rate index has been published by the Nationalbank for the period prior to 1970. For the period 1948-1969 the index has been compiled by weighting (geometrically) the development in indices for the bilateral value of one krone vis-à-vis the currencies of 9 different countries (Germany, U.K., Sweden, Norway, U.S.A., France, The Netherlands, Finland and Switzerland) using the 1983-weights mentioned above. (5) Adjusted for break in series in 1970.

Consumer price index, abroad, quarterly data 1948q1-2010q2
Sources:

Various issues of Statistics Denmark, *Statistical Yearbook*. Other sources: Danmarks Nationalbank's website (www.nationalbanken.dk), Pedersen, E. H. (1996) and Ølgaard (1992).

Comments:

(1) Trade-weighted average of the consumer price development in Denmark's main trading partners. The weights and weighting methodology are identical to those used for the calculation of the nominal effective krone-rate index, cf. the description above. (2) Quarterly averages. (3) Adjusted for break in series in 1970.

Consumer price index, West Germany, quarterly data 1948q1-1970q4
Sources:

Various issues of Statistics Denmark, *Statistical Yearbook.*

Comments:

(1) Adjusted for break in series in 1950, 1951, 1952, 1954, 1961, 1962, 1965 and 1968.

Consumer price index, U.K., quarterly data 1948q1-1970q4
Sources:

Various issues of Statistics Denmark, *Statistical Yearbook.*

Comments:

(1) Adjusted for break in series in 1950, 1955, 1962, 1965 and 1968.

Consumer price index, Sweden, quarterly data 1948q1-1970q4
Sources:

Various issues of Statistics Denmark, *Statistical Yearbook.*

Comments:

(1) Adjusted for break in series in 1950, 1955, 1962, 1965 and 1968.

Consumer price index, Norway, quarterly data 1948q1-1970q4
Sources:

Various issues of Statistics Denmark, *Statistical Yearbook.*

Comments:

(1) Adjusted for break in series in 1950, 1955, 1962, 1965 and 1968.

Consumer price index, U.S.A., quarterly data 1948q1-1970q4
Sources:

Various issues of Statistics Denmark, *Statistical Yearbook.*

Comments:

(1) Adjusted for break in series in 1950, 1955, 1962, 1965 and 1968.

Consumer price index, France, quarterly data 1948q1-1970q4
Sources:

Various issues of Statistics Denmark, *Statistical Yearbook.*

Comments:

(1) Adjusted for break in series in 1950, 1955, 1957, 1960, 1962, 1964, 1965 and 1968.

Consumer price index, The Netherlands, quarterly data 1948q1-1970q4
Sources:

Various issues of Statistics Denmark, *Statistical Yearbook.*

Comments:

(1) Adjusted for break in series in 1951, 1953, 1954, 1961, 1962, 1965 and 1968.

Consumer price index, Finland, quarterly data 1948q1-1970q4
Sources:

Various issues of Statistics Denmark, *Statistical Yearbook.*

Comments:

(1) Adjusted for break in series in 1950, 1955, 1962, 1965 and 1968.

Consumer price index, Switzerland, quarterly data 1948q1-1970q4
Sources:

Various issues of Statistics Denmark, *Statistical Yearbook.*

Comments:

(1) Adjusted for break in series in 1950, 1955, 1962, 1965 and 1968.

Real effective krone-rate index with consumer prices as deflator 1948q1-2010q2
Comments:

(1) The weights and weighting methodology are identical to those used for the calculation of the nominal effective krone-rate index, cf. the description above.

Price index for sale of one-family houses, quarterly data 1948q1-2010q2
Sources:

Various issues of Statistics Denmark, *Statistiske Efterretninger*. Other sources: Thygesen (1971); and Statistics Denmark, *StatBank Denmark*.

Comments:

(1) 1948-1950: Covers the price development on sales of smallholdings. 1951-1967: Covers the price development for sale of one-family houses in provincial towns. 1968-2010: Covers the cash-price development for one-family houses in ordinary free trade in all of Denmark. (2) Adjusted for break in series 1950 and 1968.

Share price index, quarterly data 1948q1-2010q2
Sources:

Various issues of: Statistics Denmark, *Statistics Månedsoversigt* and Statistics Denmark, *Statistical Yearbook*. Other sources: Danmarks Nationalbank's website (www.nationalbanken.dk).

Comments:

(1) End of quarter. (2) 1948-1993: Covers all shares at the Copenhagen Stock Exchange. 1994-2010: OMXC20 (KFX). (3) Adjusted for break in series in 1957, 1959, 1964, 1972, 1982 and 1994.

Broad money stock (M2), quarterly data 1948q1-2010q2
Various issues of: Danmarks Nationalbank, *Report and Accounts*. Other sources: Thygesen (1971); and Danmarks Nationalbank's website (www.nationalbanken.dk).

Comments:

(1) End of quarter. (2) For the period prior to 1993 calculated on the basis of year-to-year growth rates where adjustments have been made for break in series.

Credit to the domestic non-bank sector extended by resident commercial banks and savings banks, quarterly data 1948q1-2010q2

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

Comments:

(1) End of quarter. (2) Covers commercial banks and savings banks. (3) For the period prior to 1981 calculated on the basis of year-to-year growth rates where adjustments have been made for break in series.

Credit to the domestic non-bank sector extended by resident mortgage banks, quarterly data 1948q1-2010q2

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

Comments:

(1) End of quarter. (2) For the period 1961-1981 calculated on the basis of accumulated flow-of-funds figures regarding the net supply of Danish mortgage-credit bonds at market values (1964-1981) or nominal values (1961-1963). (3) For the period 1948-1956 are the quarterly figures interpolated from annual data. (4) Adjusted for break in series in 1957, 1961 and 1981.

Bank's write-downs ratio, quarterly data 1948q1-2010q2

Sources:

Various issues of: Danmarks Nationalbank, Financial Stability; Finanstilsynet, Markedsudviklingen for pengeinstitutter; Finanstilsynet, Pengeinstitutternes regnskaber, 1. halvår; and Statistics Denmark, *Statistical Yearbook*. Other sources: Busk-Nielsen *et al*. (1996); Finanstilsynet (2008) and Økonomiministeriet (1994).

Comments:

(1) Quarterly write-downs on loans and guaranties in per cent of end-quarter outstanding loans and guaranties. The write-down ratios are not annualised and are compiled net of receipts on relinquished debts. (2) Covers write-downs in commercial banks and savings banks. (3) For the period 1991-2010 based on quarterly or semi-annual data. For the period 1948-1990 are the quarterly data interpolated from annual data using the least-squares-based method described in Boot *et al*. (1967).

Annex B: Summary quarterly national accounts for Denmark 1948-2010

Table B.1: Quarterly national accounts data, current prices, non-seasonally adjusted, 1948q1-2010q2

Quarter	Private consumption	Government consumption	Gross investments	Exports of goods and services	Imports of goods and services	Gross Domestic Product
	million kroner					
1948q1	2591	500	959	992	819	4223
1948q2	2765	500	816	877	1021	3937
1948q3	2703	515	1181	990	1216	4173
1948q4	3121	543	1350	1064	1241	4839
1949q1	2713	520	1059	1071	1302	4060
1949q2	2935	524	1002	1182	1355	4288
1949q3	2896	542	1143	1232	1252	4560
1949q4	3392	570	1229	1446	1348	5289
1950q1	3042	542	1195	1353	1750	4381
1950q2	3289	550	1386	1441	1627	5040
1950q3	3463	582	1481	1719	1969	5276
1950q4	3867	636	1548	1812	1916	5948
1951q1	3447	633	1367	1891	1959	5378
1951q2	3632	660	1362	2051	2352	5352
1951q3	3517	702	1554	2043	2251	5565
1951q4	3991	758	1302	2276	2059	6269
1952q1	3552	734	1336	2190	2219	5593
1952q2	3701	748	1383	1915	1992	5755
1952q3	3701	784	1542	2252	2074	6205
1952q4	4140	836	1610	2094	2096	6583
1953q1	3664	804	1475	2180	2168	5954
1953q2	3879	817	1576	2056	1974	6354
1953q3	3874	855	1848	2158	2313	6423
1953q4	4267	915	1853	2299	2246	7087
1954q1	3813	885	1716	2174	2155	6433
1954q2	4224	900	1658	2325	2524	6582
1954q3	4270	936	1953	2393	2657	6895
1954q4	4533	990	1677	2416	2614	7002
1955q1	4230	941	1440	2477	2486	6601
1955q2	4335	947	1331	2505	2453	6664
1955q3	4340	982	1949	2598	2684	7184
1955q4	4803	1042	1864	2743	2634	7818
1956q1	4412	1000	1794	2616	2459	7363
1956q2	4649	1012	1578	2774	2887	7126
1956q3	4672	1052	2166	2854	3001	7742
1956q4	5086	1114	1934	2924	3086	7972
1957q1	4556	1064	1958	2882	3206	7253
1957q2	4875	1073	2218	2996	2850	8311
1957q3	4727	1113	2296	3164	3024	8276
1957q4	5169	1177	1890	3169	2987	8419
1958q1	4705	1125	1704	3039	2794	7778
1958q2	4979	1138	1782	3107	2686	8319
1958q3	5026	1187	2227	3149	3309	8281
1958q4	5556	1267	2155	3293	3096	9175
1959q1	5110	1224	2019	3121	2981	8493
1959q2	5393	1242	2402	3165	3348	8854
1959q3	5374	1288	2821	3664	3599	9548
1959q4	5959	1357	2860	3688	3821	10043
1960q1	5389	1284	2804	3488	3888	9077
1960q2	5848	1301	2958	3652	3679	10080
1960q3	5818	1373	3115	3726	3785	10246
1960q4	6402	1496	2789	3794	4011	10470
1961q1	5937	1487	3099	3584	3898	10209
1961q2	6309	1559	3342	3614	3755	11068
1961q3	6617	1677	3140	3912	4135	11210
1961q4	7221	1838	3108	3990	4311	11846
1962q1	6713	1817	3393	3861	4267	11517
1962q2	7369	1876	3638	3938	4318	12504
1962q3	7518	1971	4264	4089	4954	12889
1962q4	7711	2094	3501	4329	4676	12959
1963q1	7036	1992	3180	4155	4140	12223
1963q2	7680	2016	2907	4625	4587	12640
1963q3	7950	2113	3848	4715	4825	13801
1963q4	8403	2277	4013	4813	4856	14650
1964q1	7887	2228	4071	4728	5035	13879
1964q2	8469	2306	4404	4873	5666	14386
1964q3	8835	2456	4679	5269	5566	15674
1964q4	9427	2673	4941	5698	5928	16812
1965q1	8902	2628	5631	5311	5862	16609
1965q2	9216	2721	4895	5589	6121	16300

Table B.1 (continued): Quarterly national accounts data, current prices, non-seasonally adjusted, 1948q1-2010q2

Quarter	Private consumption	Government consumption	Gross investments	Exports of goods and services	Imports of goods and services	Gross Domestic Product
	million kroner					
1965q3	9587	2889	5281	5711	6045	17423
1965q4	10372	3125	4935	6094	6133	18393
1966q1	9636	3044	4976	5820	6164	17311
1966q2	10340	3134	5187	6088	6310	18439
1966q3	10898	3319	5686	6027	6480	19450
1966q4	11495	3589	5865	6388	6989	20349
1967q1	10718	3505	5319	6119	6538	19123
1967q2	12057	3618	5207	6290	6852	20320
1967q3	11489	3843	6514	6520	7030	21336
1967q4	12501	4170	6618	6736	7493	22533
1968q1	11972	4088	6258	7120	7175	22263
1968q2	12312	4207	5735	6868	7320	21802
1968q3	12932	4430	6130	7516	7809	23199
1968q4	13956	4739	7211	7385	8393	24898
1969q1	13233	4557	6799	7689	7998	24280
1969q2	14273	4688	7697	8167	8849	25975
1969q3	14743	5016	7667	8204	9205	26425
1969q4	15586	5535	8086	8527	9580	28155
1970q1	14490	5560	7191	8361	9153	26450
1970q2	15789	5870	8774	9186	10496	29123
1970q3	15572	6346	8080	9683	10111	29570
1970q4	16506	6976	9395	9509	11173	31213
1971q1	16062	6901	10222	9021	10312	31894
1971q2	16312	7109	11402	10264	10810	34277
1971q3	16540	7436	10518	10282	10534	34242
1971q4	17934	7848	10892	10396	11337	35733
1972q1	17383	7852	10412	10604	10712	35540
1972q2	17975	8291	11822	11382	10579	38891
1972q3	18612	8532	12971	11001	11616	39500
1972q4	20368	8950	12940	11942	12672	41528
1973q1	20587	8874	13516	12138	13330	41784
1973q2	21345	9501	15440	12924	14113	45097
1973q3	22023	9544	12700	14408	14310	44365
1973q4	23974	10479	15500	14972	16668	48257
1974q1	23791	10665	16420	15525	19388	47013
1974q2	24440	11510	16644	17020	18593	51022
1974q3	24275	11788	14268	17385	17975	49741
1974q4	26490	13149	13844	17785	17767	53501
1975q1	26660	12996	13175	16590	16973	52448
1975q2	27476	13611	14093	18285	17272	56192
1975q3	28474	13947	13316	17702	17914	55525
1975q4	32262	14761	17069	19196	22134	61154
1976q1	32093	14698	18541	18388	21996	61726
1976q2	34037	15562	20046	20218	22359	67504
1976q3	34547	15850	16101	20130	23143	63485
1976q4	37408	16840	18353	21337	25168	68771
1977q1	37032	16264	16746	21318	24193	67167
1977q2	37794	16989	20137	21685	24413	72192
1977q3	39677	17585	18920	22413	25136	73459
1977q4	41139	18918	20145	23731	26345	77588
1978q1	40508	18573	19182	21704	24403	75564
1978q2	42448	19567	20170	24680	25337	81527
1978q3	43094	20067	19409	24055	25338	81288
1978q4	45439	21451	21467	25295	28185	85467
1979q1	44685	21295	21411	24748	26889	85250
1979q2	46802	22234	23791	27656	29850	90632
1979q3	46558	22574	23196	28292	31440	89181
1979q4	51056	24619	23954	31319	35110	95838
1980q1	48686	24604	26604	32696	37288	95302
1980q2	49046	25870	26125	31799	34305	98535
1980q3	48857	26082	18209	34299	32994	94453
1980q4	54245	27632	19320	35137	35491	100843
1981q1	51633	27447	21422	37923	38144	100281
1981q2	54117	29296	22111	41014	40284	106253
1981q3	54058	29534	20336	41912	40531	105309
1981q4	60007	32006	21549	43271	44455	112378
1982q1	58189	31812	25580	43819	46407	112992
1982q2	60733	33996	25989	46888	46050	121556
1982q3	60845	34423	25771	46542	46429	121153
1982q4	67053	36730	24340	48735	49478	127380

Table B.1 (continued): Quarterly national accounts data, current prices, non-seasonally adjusted, 1948q1-2010q2

Quarter	Private consumption	Government consumption	Gross investments	Exports of goods and services	Imports of goods and services	Gross Domestic Product
	million kroner					
1983q1	64794	35640	24806	47971	45994	127216
1983q2	66867	36534	29035	50639	48353	134722
1983q3	67633	36480	25030	50454	48572	131025
1983q4	75269	38154	27244	54786	55057	140396
1984q1	72586	36959	31933	53185	53951	140711
1984q2	75252	37960	33267	56394	54735	148138
1984q3	73793	37854	31671	57176	54518	145976
1984q4	81892	39921	32573	59562	60624	153324
1985q1	78485	39334	36076	59501	61791	151605
1985q2	82179	40580	36072	62341	61307	159865
1985q3	82493	40646	34474	62019	60582	159051
1985q4	88983	41845	42218	62395	66126	169314
1986q1	86878	40749	44576	56581	60100	168684
1986q2	89639	41477	48486	61077	63497	177182
1986q3	90115	41279	39683	56829	58715	169190
1986q4	94869	42950	43083	58178	60307	178773
1987q1	88399	43545	40959	56043	55500	173446
1987q2	93271	46314	45079	59978	56761	187881
1987q3	92516	46347	35790	59895	57728	176821
1987q4	99671	47866	42253	64503	63829	190463
1988q1	94772	46762	38906	62821	57437	185825
1988q2	96603	49552	44866	63796	60813	194003
1988q3	95960	49642	34739	64997	60762	184576
1988q4	102717	50928	39244	70809	65951	197747
1989q1	97566	50790	46023	66406	63302	197483
1989q2	102610	50839	45928	75242	70171	204447
1989q3	101639	51216	36784	72784	67549	194873
1989q4	108118	51981	40037	77343	71043	206437
1990q1	101083	51967	45455	74226	66189	206542
1990q2	106307	52573	46690	77956	69118	214408
1990q3	104838	52686	38381	76205	66312	205798
1990q4	110952	53973	37074	83944	72043	213900
1991q1	107177	54770	44408	77434	67511	216278
1991q2	110522	54945	45192	85439	74040	222058
1991q3	109061	55499	37453	86675	73151	215537
1991q4	115491	56151	36171	87469	74791	220491
1992q1	112068	56206	43003	84928	72162	224043
1992q2	114502	56658	42633	86335	73147	226981
1992q3	112239	57247	38207	85111	69741	223063
1992q4	120135	58937	38188	86777	71529	232508
1993q1	111401	58354	43233	79605	68932	223661
1993q2	113213	59994	40237	82029	66989	228484
1993q3	112858	60771	31706	87499	69247	223587
1993q4	124108	61980	32929	91570	74509	236078
1994q1	120095	62057	42586	84628	75103	234263
1994q2	126332	62292	46172	92186	78705	248277
1994q3	124559	62006	36626	94129	78499	238821
1994q4	133159	62984	46813	97286	84659	255583
1995q1	125955	63322	51321	95066	85448	250216
1995q2	131081	64156	50861	94808	83548	257358
1995q3	127979	64551	43729	94996	82583	248672
1995q4	136778	65157	52971	98299	89906	263299
1996q1	131002	66117	48068	96450	85250	256387
1996q2	135641	68102	52131	101670	86974	270570
1996q3	132738	68659	48233	101501	86184	264947
1996q4	142340	68802	55163	105522	94242	277585
1997q1	135192	68742	57315	99790	92069	268970
1997q2	144236	70361	60790	110037	98760	286664
1997q3	137813	70859	57142	110528	99643	276699
1997q4	151786	71067	59003	116217	104764	293309
1998q1	141724	72457	65370	109439	105957	283033
1998q2	146906	74399	64273	105354	102032	288900
1998q3	145259	75211	56520	115612	104355	288247
1998q4	156400	76044	64446	114305	107759	303436
1999q1	145704	75655	57803	114183	103797	289548
1999q2	147496	78084	62464	118507	103495	303056
1999q3	146929	78319	57377	124737	107990	299372
1999q4	159003	80312	63060	136537	117416	321496
2000q1	150334	78786	69038	132445	121075	309528
2000q2	153338	80779	72716	142475	126958	322350

Table B.1 (continued): Quarterly national accounts data, current prices, non-seasonally adjusted, 1948q1-2010q2

Quarter	Private consumption	Government consumption	Gross investments	Exports of goods and services	Imports of goods and services	Gross Domestic Product
	million kroner					
2000q3	151460	81505	61638	156934	132407	319130
2000q4	161550	84029	70692	170498	143813	342956
2001q1	154266	81838	62566	156461	133926	321205
2001q2	157922	85322	69786	157499	137455	333074
2001q3	155069	86600	66784	155949	132951	331451
2001q4	164430	89504	72843	160976	137873	349880
2002q1	158846	86571	68217	154176	139251	328559
2002q2	161401	90280	74583	162437	143129	345572
2002q3	160037	90816	67669	161800	139595	340727
2002q4	171972	92545	69674	169903	146215	357879
2003q1	163052	89145	68692	155344	137393	338840
2003q2	163566	93009	68941	154794	132870	347440
2003q3	162756	93103	63892	159908	133956	345703
2003q4	177568	95979	73439	165068	143347	368707
2004q1	169662	94272	69464	155406	137600	351204
2004q2	173329	97602	74170	166962	146644	365419
2004q3	173137	97058	76318	168217	151313	363417
2004q4	191086	100097	78553	174419	158014	386141
2005q1	177569	97379	72325	167351	152265	362359
2005q2	186752	100467	83449	189616	168583	391701
2005q3	182884	100432	79039	197004	173474	385885
2005q4	197934	104230	86994	203034	186880	405312
2006q1	190787	102448	81639	200479	188238	387115
2006q2	198715	105224	97478	210660	197323	414754
2006q3	190486	105542	94662	216857	198764	408783
2006q4	206594	109390	96836	221606	213420	421006
2007q1	198159	106703	96871	210880	206996	405617
2007q2	204183	108854	98217	216662	206872	421044
2007q3	200195	109157	95723	225113	209391	420797
2007q4	219128	114416	98609	233727	221866	444014
2008q1	208171	110535	93608	227651	221028	418937
2008q2	216255	114684	98933	246369	233641	442600
2008q3	207412	116711	93774	248874	231023	435748
2008q4	213673	121882	95088	233017	223497	440163
2009q1	199433	119270	78141	194073	185215	405702
2009q2	203853	123269	70651	191633	178098	411308
2009q3	200411	124583	69265	198159	177912	414506
2009q4	213885	129260	71644	201357	185293	430853
2010q1	211354	126187	63838	197361	179579	419161
2010q2	213817	129691	75635	222240	198772	442611

Table B.2: Quarterly national accounts data, constant prices, non-seasonally adjusted, 1948q1-2010q2

Quarter	Private consumption	Government consumption	Gross investments	Exports of goods and services	Imports of goods and services	Gross Domestic Product
	million 2000-kroner					
1948q1	39307	12935	13565	6624	5413	67018
1948q2	40954	13028	11179	5836	7269	63727
1948q3	40395	13417	16580	6941	8653	68680
1948q4	44239	13770	17694	7492	8455	74741
1949q1	39773	13090	13415	7184	8557	64906
1949q2	41884	13183	13329	7939	9790	66546
1949q3	41917	13510	15758	8410	9360	70236
1949q4	46365	13731	17417	9689	8992	78210
1950q1	42157	12863	14684	8492	10552	67645
1950q2	43727	12944	17589	9291	10670	72882
1950q3	45490	13439	19120	11705	12743	77011
1950q4	47699	14026	19143	11981	12076	80773
1951q1	43025	13670	14855	10852	10551	71852
1951q2	43795	14084	14194	11591	11491	72172
1951q3	42783	14738	18497	12023	11226	76815
1951q4	46141	15273	14730	12198	10159	78182
1952q1	42513	14570	13167	11223	10112	71360
1952q2	43749	14832	13018	10303	10111	71792
1952q3	44004	15475	17033	13318	11582	78248
1952q4	47206	16124	18012	12028	11533	81837
1953q1	43135	15593	15166	12050	11366	74578
1953q2	44931	15989	16374	11657	11275	77676
1953q3	45401	16699	20787	13504	13735	82656
1953q4	48327	17317	19869	14089	12843	86758
1954q1	44886	16573	18092	12481	11615	80418
1954q2	48189	16823	15442	13400	14749	79106
1954q3	49025	17401	21220	14865	15794	86717
1954q4	50506	17873	18832	14489	15139	86561
1955q1	47701	16946	14682	13840	13158	80011
1955q2	48001	17062	12051	14103	14297	76920
1955q3	48025	17523	21573	15818	15809	87130
1955q4	50616	17891	20035	15389	14952	88978
1956q1	47517	16879	18555	13846	12831	83965
1956q2	49046	17000	13974	14822	15858	78983
1956q3	49422	17559	21583	16030	16631	87962
1956q4	51830	18124	18493	16162	16913	87696
1957q1	47620	17376	17225	15061	15859	81423
1957q2	50259	17625	20114	15930	15293	88636
1957q3	48920	18172	21762	17665	16861	89659
1957q4	51964	18561	18134	18240	16349	90551
1958q1	48848	17456	15201	16663	14994	83173
1958q2	50965	17586	15218	17749	15577	85941
1958q3	51918	18228	22182	19038	19523	91842
1958q4	55216	18941	20345	18959	17862	95599
1959q1	51803	18334	17586	16660	16810	87573
1959q2	53681	18788	19401	17908	19776	90002
1959q3	53872	19584	26291	20924	21654	99017
1959q4	57103	20239	26355	21226	22167	102757
1960q1	52958	19278	24427	19027	21328	94361
1960q2	56135	19535	23422	20643	20913	98824
1960q3	56276	20231	27711	21733	22420	103531
1960q4	59751	20867	24351	21974	23114	103828
1961q1	56695	19923	26051	19826	21566	100929
1961q2	58883	20362	28088	19767	21465	105635
1961q3	61177	21392	25167	23036	24154	106618
1961q4	64380	22505	24128	24007	24732	110288
1962q1	60857	22024	25222	20633	23589	105147
1962q2	64680	22686	25487	21257	24559	109551
1962q3	65902	23640	33929	23629	28283	118818
1962q4	64638	24299	27990	24887	27229	114585
1963q1	60060	22902	24619	21670	22650	106600
1963q2	63509	23138	18968	24556	25887	104283
1963q3	65995	24066	29792	26106	27534	118426
1963q4	67821	25110	29650	26134	27000	121715
1964q1	64730	24415	30215	23575	26749	116185
1964q2	67664	25076	29673	24828	31369	115872
1964q3	70199	26144	33297	28318	31164	126794
1964q4	72451	26971	33964	31093	32255	132225
1965q1	69329	25596	38221	26435	30738	128842
1965q2	70128	25912	32060	27892	32866	123125

Table B.2 (continued): Quarterly national accounts data, constant prices, non-seasonally adjusted, 1948q1-2010q2

Quarter	Private consumption	Government consumption	Gross investments	Exports of goods and services	Imports of goods and services	Gross Domestic Product
	million 2000-kroner					
1965q3	71500	26878	36664	29649	32987	131704
1965q4	74543	27838	30429	32117	33431	131495
1966q1	69977	26755	30747	28231	31601	124109
1966q2	72871	27379	31077	29132	33572	126887
1966q3	76004	28652	36418	30828	34937	136964
1966q4	77961	29881	36525	33396	37180	140582
1967q1	74105	28864	32803	29670	33623	131818
1967q2	80965	29570	30466	31054	36630	135424
1967q3	75448	30865	38918	33049	37419	140861
1967q4	79137	31995	39044	34888	38908	146156
1968q1	76331	30616	34558	34393	34384	141514
1968q2	76383	31246	30470	32777	36506	134371
1968q3	79458	32665	34707	36559	39601	143789
1968q4	83453	34085	39971	36138	42107	151540
1969q1	80464	32992	36166	34784	38359	146047
1969q2	84959	33978	37844	38101	43317	151565
1969q3	86976	35765	41856	39062	45236	158423
1969q4	89246	37494	42454	40119	45882	163433
1970q1	84152	36386	36528	36330	41432	151963
1970q2	89385	37546	39933	40437	48252	159049
1970q3	87055	39570	39832	43040	46772	162726
1970q4	89502	41510	45571	41870	50407	168046
1971q1	88651	40287	50895	37966	44048	173751
1971q2	88231	41291	56518	42765	46792	182013
1971q3	88051	42947	44965	43392	45746	173609
1971q4	91034	44187	52738	44112	49348	182723
1972q1	87347	42503	49484	42954	44759	177530
1972q2	89270	43832	53764	44663	43014	188515
1972q3	91412	44794	51010	43337	47990	182563
1972q4	95690	45927	57159	46015	51563	193227
1973q1	95469	44041	58920	43323	52147	189607
1973q2	97307	45827	63989	43937	54864	196197
1973q3	98769	45721	46893	48418	54172	185630
1973q4	102091	47079	59415	48215	58451	198349
1974q1	98858	45874	58805	45303	57887	190953
1974q2	99491	46896	57722	47757	54111	197755
1974q3	96326	47206	41485	49183	51444	182755
1974q4	98885	48730	44571	50006	50169	192022
1975q1	98643	45940	41269	44402	46180	184074
1975q2	99889	46643	42771	48171	47969	189504
1975q3	101490	47400	34423	46540	50251	179602
1975q4	110891	49337	52077	50059	61167	201197
1976q1	107470	47533	54158	45412	58459	196115
1976q2	110744	49105	56899	48910	57256	208402
1976q3	110144	49980	40914	49463	59512	190989
1976q4	113458	51446	51199	52418	63748	204772
1977q1	111429	48667	48329	49772	58576	199621
1977q2	111912	49960	53437	49233	58628	205914
1977q3	116020	51606	41922	50911	61091	199369
1977q4	113687	53738	53230	53079	62790	210945
1978q1	110843	51493	48042	46541	56463	200456
1978q2	114202	53326	51287	52194	59846	211163
1978q3	115139	54760	39798	51429	59996	201129
1978q4	116986	57032	52611	54614	65968	215276
1979q1	113717	55242	49829	50876	58869	210796
1979q2	116799	56714	55220	55320	63298	220755
1979q3	114104	57355	42642	55692	64303	205490
1979q4	120795	59982	48511	59223	67725	220786
1980q1	113978	58031	52261	57686	64115	217840
1980q2	112827	59620	48966	54598	57954	218058
1980q3	110413	59813	29723	58710	57067	201591
1980q4	118296	61602	36126	58861	57869	217016
1981q1	111140	59751	37237	59932	56770	211289
1981q2	112398	60966	37158	61813	57418	214916
1981q3	110901	61298	25950	63054	58482	202721
1981q4	117827	63342	33627	64874	62168	217502
1982q1	112780	61196	39625	61544	61071	214075
1982q2	114030	62857	40846	64404	60470	221667
1982q3	113559	63582	31544	63971	62236	210420
1982q4	119972	65280	36624	66354	62655	225574

Table B.2 (continued): Quarterly national accounts data, constant prices, non-seasonally adjusted, 1948q1-2010q2

Quarter	Private consumption	Government consumption	Gross investments	Exports of goods and services	Imports of goods and services	Gross Domestic Product
	million 2000-kroner					
1983q1	115102	62017	36681	63635	57639	219795
1983q2	116344	63056	44077	66707	61554	228630
1983q3	117410	63050	28582	65728	62264	212506
1983q4	125616	64662	39056	70252	66449	233137
1984q1	120153	61422	43382	65327	62091	228192
1984q2	122181	62694	46849	68110	62979	236854
1984q3	119885	62753	38274	69203	64882	225233
1984q4	128553	64889	46040	71048	67938	242591
1985q1	122527	62662	47359	68043	66040	234551
1985q2	126051	64396	50122	71169	67061	244677
1985q3	127881	64778	41188	73037	71081	235803
1985q4	135071	66274	56753	74774	75297	257575
1986q1	132509	63182	56323	67907	69861	250061
1986q2	133933	64495	61619	74848	78196	256698
1986q3	134546	64715	48038	71316	76675	241941
1986q4	137730	66981	59121	73554	77481	259904
1987q1	129295	64780	52051	70197	70409	245913
1987q2	133593	66190	59479	75048	72884	261425
1987q3	132692	66486	42417	76150	74658	243087
1987q4	138907	68303	52521	82695	81332	261094
1988q1	131650	65434	49244	79470	72566	253233
1988q2	132838	67250	56432	80409	76712	260217
1988q3	132144	67389	42035	82570	77036	247103
1988q4	137401	68178	51557	86614	81139	262610
1989q1	130069	66970	55094	79410	74813	256730
1989q2	134297	66137	53861	87525	81891	259930
1989q3	132535	66382	42368	85217	79194	247308
1989q4	137886	66540	49255	89790	82750	260721
1990q1	130010	66591	47546	87294	78354	253087
1990q2	134801	66292	50886	91589	81918	261650
1990q3	133145	66111	46643	89750	79215	256434
1990q4	138247	66499	46043	96385	83727	263447
1991q1	133186	67020	45430	90173	79996	255813
1991q2	135402	66468	48480	98515	84607	264258
1991q3	133915	66940	43370	99252	84012	259465
1991q4	140173	67335	46193	99470	84738	268433
1992q1	136679	67442	47326	95508	83194	263761
1992q2	138126	66514	47063	97018	83307	265414
1992q3	135958	66987	42386	96210	79757	261784
1992q4	143835	68603	42056	98664	80868	272290
1993q1	133367	68104	46604	92011	79810	260276
1993q2	134030	69904	43435	94172	78592	262949
1993q3	133171	70743	32966	99623	80346	256157
1993q4	144605	72033	39581	104056	84514	275761
1994q1	139245	71836	46690	96347	86130	267988
1994q2	144506	71263	49455	104998	90169	280053
1994q3	142257	70978	37954	107574	90384	268379
1994q4	150416	72221	51360	110472	94540	289929
1995q1	141795	72288	54112	106296	93189	281302
1995q2	145892	72669	54928	105536	93012	286013
1995q3	143144	73149	47959	105694	93454	276492
1995q4	152431	73864	58559	109283	99127	295010
1996q1	145229	74632	53736	106997	95641	284953
1996q2	148447	75389	56729	110768	95940	295393
1996q3	145143	75834	50087	110082	94915	286231
1996q4	154687	75734	55971	114593	100605	300380
1997q1	146832	75108	60264	107883	99196	290891
1997q2	154530	75844	60666	116898	104733	303205
1997q3	147144	76008	60195	115520	105679	293188
1997q4	161019	76316	64353	120533	111412	310809
1998q1	150260	77351	69555	114908	112141	299933
1998q2	154243	78409	66694	112142	110306	301182
1998q3	152437	78721	57890	124676	113829	299895
1998q4	164285	79177	67521	124911	117697	318197
1999q1	152423	78862	59598	126238	113996	303125
1999q2	152559	79858	63685	129327	112481	312948
1999q3	151053	79663	58450	134483	115626	308023
1999q4	161633	81838	63809	144821	123387	328714
2000q1	151988	80465	68900	136974	125009	313318
2000q2	153602	80275	72555	144687	128350	322769

Table B.2 (continued): Quarterly national accounts data, constant prices, non-seasonally adjusted, 1948q1-2010q2

Quarter	Private consumption	Government consumption	Gross investments	Exports of goods and services	Imports of goods and services	Gross Domestic Product
	million 2000-kroner					
2000q3	151013	81086	62978	156204	131490	319791
2000q4	160079	83273	69651	164486	139404	338085
2001q1	152339	80885	62293	154249	132250	317516
2001q2	154080	82300	68570	153119	133555	324514
2001q3	151104	83386	64870	153192	130425	322127
2001q4	159662	85662	70862	160680	137938	338928
2002q1	153806	82555	67625	155577	141109	318454
2002q2	155199	84840	72336	162740	145047	330068
2002q3	153928	85292	64998	162399	142292	324325
2002q4	164169	87067	66006	169219	148602	337859
2003q1	154713	83875	68007	157155	141426	322324
2003q2	155286	85563	66431	157779	137434	327625
2003q3	155217	85461	58464	160764	138239	321667
2003q4	168351	87980	70733	166402	148591	344875
2004q1	160219	85856	65651	159028	144929	325825
2004q2	162510	87618	71396	168182	152245	337461
2004q3	163254	86715	72724	165426	154822	333297
2004q4	178966	89078	73142	169740	159657	351269
2005q1	165590	86651	66770	164689	157260	326440
2005q2	173374	88391	77415	184974	174041	350113
2005q3	169632	88132	71475	186820	173810	342249
2005q4	181199	91470	81539	192399	186415	360192
2006q1	175562	89338	75049	185929	185496	340382
2006q2	181061	90663	89319	195795	194101	362737
2006q3	172581	90751	85336	196133	191494	353307
2006q4	187690	93707	87216	204148	203769	368992
2007q1	178815	91124	85292	194295	197845	351681
2007q2	182474	91609	87440	197308	195155	363676
2007q3	179192	91186	83135	203237	196070	360680
2007q4	194964	95326	87909	204919	204164	378954
2008q1	182815	91430	82250	197552	200869	353178
2008q2	187859	93002	85988	210071	208661	368259
2008q3	178754	93357	81254	208273	203278	358360
2008q4	184420	97171	84688	203044	204445	364878
2009q1	172274	94808	69460	182460	180684	338318
2009q2	174892	96047	63740	181900	173585	342994
2009q3	171288	96784	61735	185174	174834	340147
2009q4	183732	100165	65051	186145	180249	354844
2010q1	178987	97143	59199	178319	173343	340305
2010q2	179612	98891	70557	191001	185337	354724

Annex C: Other key quarterly macroeconomic indicators for Denmark 1948-2010

Table C.1: Quarterly key macroeconomic indicators, non-seasonally adjusted, 1948q1-2010q2

Quarter	Unemployment rate	Index of average hourly earnings in manufacturing	Official discount rate of Danmarks Nationalbank	Yield on long-term Danish government bonds	Private banks' average lending rate	Private banks' average deposit rate
	Per cent of the labour force	2005q1=100	Per cent per annum	Per cent per annum	Per cent per annum	Per cent per annum
1948q1	3.8	1.42	3.50	3.90	3.89	1.59
1948q2	2.1	1.53	3.50	4.00	3.89	1.59
1948q3	1.8	1.51	3.50	4.10	3.89	1.59
1948q4	2.8	1.56	3.50	4.40	3.89	1.59
1949q1	1.9	1.52	3.50	4.50	4.37	1.80
1949q2	4.6	1.60	3.50	4.50	4.37	1.80
1949q3	3.0	1.57	3.50	4.30	4.37	1.80
1949q4	2.5	1.61	3.50	4.40	4.37	1.80
1950q1	3.3	1.55	3.50	4.30	4.22	1.56
1950q2	3.2	1.68	3.50	4.40	4.22	1.56
1950q3	2.3	1.65	4.47	4.60	5.08	2.43
1950q4	2.0	1.71	4.83	4.80	5.41	2.75
1951q1	2.8	1.69	5.00	4.90	5.46	2.40
1951q2	2.7	1.83	5.00	5.10	5.48	2.43
1951q3	3.3	1.82	5.00	5.20	5.51	2.47
1951q4	3.2	1.92	5.00	5.30	5.54	2.50
1952q1	1.6	1.85	5.00	5.30	5.60	2.55
1952q2	5.3	1.98	5.00	5.30	5.63	2.57
1952q3	5.6	1.96	5.00	5.30	5.66	2.58
1952q4	2.7	2.03	5.00	5.20	5.68	2.59
1953q1	3.1	1.95	5.00	5.20	5.74	2.63
1953q2	4.0	2.04	5.00	5.10	5.75	2.64
1953q3	2.9	2.00	4.96	5.10	5.71	2.66
1953q4	2.0	2.05	4.50	5.00	5.38	2.66
1954q1	5.0	1.97	4.50	5.00	5.67	2.89
1954q2	2.3	2.20	4.59	5.10	5.78	2.88
1954q3	1.8	2.07	5.50	5.40	6.37	3.20
1954q4	1.2	2.14	5.50	5.60	6.37	3.22
1955q1	3.9	2.07	5.50	5.40	6.31	3.17
1955q2	2.7	2.26	5.50	5.60	6.32	3.18
1955q3	2.4	2.15	5.50	5.60	6.33	3.19
1955q4	3.3	2.26	5.50	5.60	6.33	3.20
1956q1	5.4	2.19	5.50	5.60	6.37	3.23
1956q2	4.2	2.44	5.50	5.60	6.39	3.24
1956q3	2.9	2.32	5.50	5.70	6.40	3.25
1956q4	1.9	2.47	5.50	5.80	6.42	3.25
1957q1	2.8	2.38	5.50	5.80	6.49	3.33
1957q2	4.5	2.60	5.50	5.80	6.50	3.34
1957q3	3.3	2.43	5.50	5.80	6.51	3.35
1957q4	2.9	2.56	5.50	5.70	6.51	3.38
1958q1	5.1	2.46	5.50	5.40	6.44	3.31
1958q2	4.6	2.70	5.10	5.20	6.35	3.30
1958q3	2.6	2.53	4.74	5.10	6.08	3.25
1958q4	0.5	2.65	4.50	5.20	5.87	3.11
1959q1	4.0	2.63	4.50	5.10	6.09	3.33
1959q2	2.1	2.89	4.50	5.30	6.10	3.34
1959q3	1.4	2.76	4.57	5.40	6.12	3.36
1959q4	0.8	2.89	5.00	5.60	6.35	3.35
1960q1	3.5	2.79	5.36	5.99	6.63	3.43
1960q2	1.1	3.10	5.50	6.06	6.75	3.56
1960q3	0.8	2.96	5.50	6.23	6.76	3.60
1960q4	0.6	3.09	5.50	6.13	6.78	3.64
1961q1	1.7	3.02	5.50	6.11	6.98	3.85
1961q2	1.4	3.50	5.93	6.46	7.34	4.09
1961q3	0.8	3.35	6.50	7.00	7.83	4.38
1961q4	0.9	3.54	6.50	7.14	7.85	4.41
1962q1	2.4	3.45	6.50	7.23	7.73	4.27
1962q2	0.8	3.81	6.50	7.25	7.74	4.28
1962q3	0.5	3.67	6.50	7.21	7.76	4.28
1962q4	0.7	3.88	6.50	7.29	7.78	4.30
1963q1	3.9	3.76	6.50	7.38	7.71	4.24
1963q2	1.1	4.15	6.50	7.40	7.71	4.26
1963q3	0.2	3.97	6.27	7.06	7.51	4.25
1963q4	0.8	4.16	5.73	6.62	7.12	4.27
1964q1	2.7	4.10	5.50	6.51	7.39	4.27
1964q2	0.6	4.45	5.72	7.22	7.58	4.49
1964q3	0.2	4.32	6.50	7.52	8.34	4.98
1964q4	0.1	4.52	6.50	7.65	8.37	5.01
1965q1	1.2	4.47	6.50	7.72	8.26	4.88
1965q2	0.1	4.99	6.50	8.55	8.29	4.89

Table C.1 (continued): Quarterly key macroeconomic indicators, non-seasonally adjusted, 1948q1-2010q2

Quarter	Unemployment rate	Index of average hourly earnings in manufacturing	Official discount rate of Danmarks Nationalbank	Yield on long-term Danish government bonds	Private banks' average lending rate	Private banks' average deposit rate
	Per cent of the labour force	2005q1=100	Per cent per annum	Per cent per annum	Per cent per annum	Per cent per annum
1965q3	0.2	4.86	6.50	8.91	8.31	4.90
1965q4	1.3	5.15	6.50	8.78	8.34	4.91
1966q1	2.2	5.06	6.50	8.80	8.45	5.00
1966q2	0.6	5.59	6.50	8.96	8.49	5.01
1966q3	0.1	5.42	6.50	9.14	8.53	5.01
1966q4	0.3	5.69	6.50	9.04	8.57	5.03
1967q1	1.6	5.62	6.50	8.99	9.01	5.42
1967q2	0.6	6.07	6.50	9.01	9.06	5.43
1967q3	0.5	5.90	6.50	9.43	9.12	5.46
1967q4	1.3	6.15	6.64	9.43	9.26	5.50
1968q1	3.1	6.13	7.43	9.14	9.35	5.46
1968q2	1.6	6.69	6.90	9.11	9.01	5.22
1968q3	1.0	6.69	6.32	9.04	8.66	4.88
1968q4	1.5	7.00	6.00	8.83	8.15	4.41
1969q1	3.1	6.90	6.01	8.92	9.07	4.80
1969q2	1.1	7.46	8.10	9.55	9.07	4.80
1969q3	0.5	7.38	9.00	10.21	11.59	7.32
1969q4	0.9	7.84	9.00	10.07	12.69	8.42
1970q1	2.4	7.55	9.00	10.32	11.85	6.86
1970q2	0.7	8.19	9.00	11.06	11.85	6.86
1970q3	0.3	8.22	9.00	11.59	11.85	6.86
1970q4	0.6	8.83	9.00	11.30	11.85	6.86
1971q1	2.1	8.65	8.21	10.59	11.72	6.56
1971q2	1.1	9.46	7.58	10.72	10.95	5.79
1971q3	0.9	9.56	7.50	10.54	10.86	5.70
1971q4	1.1	10.04	7.50	10.13	10.86	5.70
1972q1	2.8	9.96	7.05	10.61	10.80	5.31
1972q2	1.2	10.63	7.03	10.42	10.78	5.29
1972q3	0.7	10.65	8.00	10.42	12.00	6.51
1972q4	0.5	11.20	7.02	10.32	10.77	5.28
1973q1	1.5	11.10	7.00	11.33	11.24	5.76
1973q2	0.9	12.48	7.00	11.18	11.33	5.85
1973q3	0.5	12.96	7.89	12.15	12.21	6.73
1973q4	0.7	14.01	8.12	12.67	12.39	6.91
1974q1	1.7	14.06	9.76	12.97	14.43	8.19
1974q2	1.2	15.34	10.00	14.66	14.61	8.37
1974q3	1.7	15.52	10.00	14.55	15.16	8.92
1974q4	3.6	16.80	10.00	14.34	15.61	9.37
1975q1	5.6	17.17	9.14	12.77	15.17	8.60
1975q2	5.0	18.52	8.07	12.30	13.86	7.29
1975q3	4.5	18.38	7.76	12.13	13.20	6.63
1975q4	5.3	19.67	7.50	12.37	13.02	6.45
1976q1	6.5	19.78	7.65	13.27	14.22	7.79
1976q2	4.8	20.79	8.50	14.05	15.12	8.39
1976q3	4.6	20.67	8.50	14.47	15.22	8.59
1976q4	5.5	21.90	10.62	14.95	17.82	10.89
1977q1	7.1	21.69	9.68	15.04	17.22	10.29
1977q2	6.0	23.09	9.00	15.37	16.32	9.39
1977q3	6.1	23.02	9.00	16.04	16.42	10.09
1977q4	6.6	24.24	9.00	16.40	17.02	10.29
1978q1	8.4	24.27	9.00	16.04	16.92	10.49
1978q2	7.0	25.42	9.00	14.97	16.52	9.39
1978q3	6.7	25.28	8.26	15.29	15.32	8.69
1978q4	7.2	26.60	8.00	15.62	14.92	8.29
1979q1	8.0	26.68	8.00	16.09	14.92	8.09
1979q2	5.9	27.94	8.18	16.30	15.22	8.29
1979q3	5.3	27.82	9.30	16.65	16.52	9.19
1979q4	5.7	30.27	11.00	17.23	19.12	10.69
1980q1	6.6	30.23	11.95	20.50	19.42	11.49
1980q2	5.6	31.37	13.00	21.28	20.92	12.69
1980q3	6.0	31.35	12.87	20.32	20.76	12.69
1980q4	7.8	32.98	11.28	19.42	18.96	11.29
1981q1	9.6	32.90	11.00	18.86	18.42	11.09
1981q2	8.2	33.99	11.00	19.56	18.62	11.49
1981q3	7.7	34.08	11.00	20.47	18.95	11.69
1981q4	9.3	36.18	11.00	19.32	19.38	11.49
1982q1	10.5	35.85	11.00	21.86	19.18	11.29
1982q2	8.8	37.80	11.00	22.69	19.63	11.69
1982q3	8.3	37.61	11.00	22.90	19.94	11.69
1982q4	9.5	39.75	10.65	20.99	19.60	11.59

Table C.1 (continued): Quarterly key macroeconomic indicators, non-seasonally adjusted, 1948q1-2010q2

Quarter	Unemployment rate	Index of average hourly earnings in manufacturing	Official discount rate of Danmarks Nationalbank	Yield on long-term Danish government bonds	Private banks' average lending rate	Private banks' average deposit rate
	Per cent of the labour force	2005q1=100	Per cent per annum	Per cent per annum	Per cent per annum	Per cent per annum
1983q1	11.1	39.08	9.83	16.54	18.50	11.19
1983q2	9.8	40.67	7.73	13.78	15.89	9.36
1983q3	9.1	40.35	7.50	14.90	15.56	8.99
1983q4	10.0	41.45	7.14	14.18	15.52	9.19
1984q1	11.2	40.53	7.00	13.52	15.20	8.72
1984q2	9.3	42.46	7.00	14.81	15.30	8.58
1984q3	8.7	41.94	7.00	14.92	15.39	9.00
1984q4	9.1	43.14	7.00	14.46	15.79	9.50
1985q1	10.4	42.82	7.00	13.55	15.67	8.86
1985q2	8.5	44.26	7.00	11.83	15.92	9.08
1985q3	7.4	44.26	7.00	10.63	14.65	7.91
1985q4	7.6	45.25	7.00	10.30	13.89	7.51
1986q1	8.8	44.83	7.00	9.61	13.26	7.03
1986q2	6.9	46.52	7.00	9.11	12.62	6.53
1986q3	6.4	46.42	7.00	10.48	12.65	6.50
1986q4	7.0	47.48	7.00	11.00	12.56	7.06
1987q1	8.6	47.87	7.00	11.44	12.90	7.40
1987q2	7.0	50.68	7.00	11.11	13.40	7.50
1987q3	6.5	50.55	7.00	11.14	13.30	7.40
1987q4	7.1	52.49	7.00	11.45	13.30	7.50
1988q1	8.8	51.61	7.00	10.20	13.10	7.20
1988q2	7.7	54.15	7.00	10.23	13.20	7.20
1988q3	7.5	53.99	7.00	9.72	13.00	6.90
1988q4	8.4	55.46	7.00	9.38	12.80	6.80
1989q1	9.9	54.69	7.00	9.37	12.20	6.40
1989q2	8.8	56.70	7.00	9.79	12.70	6.50
1989q3	8.4	56.12	7.00	9.46	13.10	6.80
1989q4	8.8	57.76	7.00	10.21	14.40	8.10
1990q1	9.9	57.26	7.10	11.02	14.70	8.50
1990q2	8.8	59.12	8.05	10.46	14.00	8.00
1990q3	8.8	58.95	8.50	10.44	13.70	7.70
1990q4	9.2	60.38	8.50	10.60	13.20	7.50
1991q1	10.5	59.55	9.49	9.67	13.40	7.70
1991q2	9.7	62.53	9.28	9.18	13.20	7.20
1991q3	9.6	61.68	9.25	9.27	12.90	6.80
1991q4	10.2	62.94	9.17	8.93	12.80	6.90
1992q1	11.4	61.75	9.50	8.60	12.90	7.20
1992q2	10.4	63.85	9.50	8.87	13.00	7.20
1992q3	10.3	63.84	9.50	9.45	13.30	7.50
1992q4	10.8	64.72	9.50	9.03	14.00	8.10
1993q1	12.4	63.82	10.23	8.49	13.50	8.10
1993q2	11.6	65.23	8.71	7.51	12.20	6.50
1993q3	11.5	65.24	8.76	6.85	12.10	6.30
1993q4	11.7	66.48	7.02	6.37	10.90	5.20
1994q1	13.1	65.96	5.70	6.33	10.10	4.00
1994q2	11.8	67.57	5.15	7.54	9.90	3.80
1994q3	11.2	67.31	5.00	8.60	9.90	3.80
1994q4	10.4	67.82	5.00	8.84	10.30	3.70
1995q1	11.2	67.93	5.27	8.96	10.20	3.90
1995q2	9.7	70.31	6.00	8.44	10.80	4.60
1995q3	9.5	70.07	5.40	8.09	10.60	4.40
1995q4	8.6	70.73	4.76	7.59	9.90	3.70
1996q1	9.5	70.79	4.00	7.35	9.30	3.20
1996q2	8.0	73.33	3.35	7.41	8.60	2.70
1996q3	8.0	72.87	3.25	7.26	8.60	2.70
1996q4	7.2	73.41	3.25	6.75	8.30	2.70
1997q1	8.4	73.65	3.25	6.40	7.80	2.60
1997q2	7.2	76.32	3.25	6.52	7.90	2.60
1997q3	7.2	75.77	3.25	6.17	7.70	2.60
1997q4	6.4	76.25	3.48	5.96	7.80	2.80
1998q1	7.1	76.68	3.50	5.40	7.60	2.80
1998q2	5.8	79.72	3.72	5.22	7.80	3.00
1998q3	5.8	79.23	3.80	4.93	7.90	3.10
1998q4	5.0	79.77	3.94	4.62	8.30	3.40
1999q1	5.9	80.46	3.34	4.25	7.40	2.80
1999q2	4.9	82.88	2.79	4.50	7.00	2.30
1999q3	4.9	82.10	2.75	5.35	6.90	2.20
1999q4	4.4	82.85	2.90	5.57	7.20	2.40
2000q1	5.3	83.33	3.20	5.79	7.30	2.50
2000q2	4.5	85.67	3.81	5.69	7.80	2.90

Table C.1 (continued): Quarterly key macroeconomic indicators, non-seasonally adjusted, 1948q1-2010q2

Quarter	Unemployment rate	Index of average hourly earnings in manufacturing	Official discount rate of Danmarks Nationalbank	Yield on long-term Danish government bonds	Private banks' average lending rate	Private banks' average deposit rate
	Per cent of the labour force	2005q1=100	Per cent per annum	Per cent per annum	Per cent per annum	Per cent per annum
2000q3	4.7	85.21	4.33	5.71	8.40	3.40
2000q4	4.4	85.81	4.73	5.45	8.80	3.80
2001q1	5.3	86.27	4.75	5.09	8.60	3.70
2001q2	4.5	89.70	4.61	5.27	8.40	3.50
2001q3	4.3	88.96	4.35	5.18	8.20	3.30
2001q4	4.5	89.61	3.48	4.83	7.60	2.70
2002q1	5.2	90.02	3.25	5.21	7.53	2.60
2002q2	4.5	93.03	3.25	5.36	7.48	2.50
2002q3	4.6	92.39	3.25	4.92	7.53	2.60
2002q4	5.0	93.44	3.13	4.74	7.41	2.50
2003q1	6.0	94.02	2.68	4.30	7.00	1.93
2003q2	5.5	96.78	2.36	4.12	6.73	1.71
2003q3	5.5	96.30	2.00	4.31	6.30	1.28
2003q4	6.0	97.22	2.00	4.51	6.15	1.30
2004q1	6.6	97.27	2.00	4.25	6.08	1.33
2004q2	5.6	100.04	2.00	4.43	5.96	1.35
2004q3	5.4	99.26	2.00	4.48	5.94	1.36
2004q4	5.6	99.79	2.00	4.06	5.81	1.40
2005q1	6.0	100.02	2.00	3.73	5.74	1.43
2005q2	5.0	102.54	2.00	3.38	5.59	1.44
2005q3	4.7	101.93	2.00	3.17	5.46	1.46
2005q4	4.6	102.62	2.08	3.34	5.35	1.49
2006q1	4.7	102.92	2.33	3.50	5.39	1.69
2006q2	3.8	105.84	2.57	4.01	5.58	1.95
2006q3	3.6	105.08	2.91	3.93	5.80	2.23
2006q4	3.4	105.92	3.29	3.81	6.05	2.57
2007q1	3.5	106.45	3.56	4.00	6.31	2.96
2007q2	2.8	110.00	3.82	4.39	6.48	3.21
2007q3	2.4	109.49	4.00	4.44	6.71	3.45
2007q4	2.2	110.51	4.00	4.31	6.78	3.50
2008q1	2.2	111.08	4.00	4.09	6.81	3.58
2008q2	1.6	115.00	4.00	4.51	7.02	3.69
2008q3	1.6	114.20	4.24	4.55	7.18	3.81
2008q4	2.0	114.60	4.08	3.98	7.75	4.09
2009q1	3.2	115.30	2.65	3.48	6.78	2.92
2009q2	3.5	118.10	1.50	3.62	5.87	2.05
2009q3	3.5	117.20	1.11	3.66	5.47	1.69
2009q4	4.1	117.40	1.00	3.58	5.13	1.41
2010q1	4.9	118.50	0.79	3.49	4.95	1.22
2010q2	4.0	121.20	0.75	2.99	4.78	1.08

Table C.2: Quarterly key macroeconomic indicators, non-seasonally adjusted, 1948q1-2010q2

Quarter	Nominal effective krone-rate index	Consumer price index, Denmark	Consumer price index, abroad	Real effective krone-rate index	Price index for sale of one-family houses,	Share price index
	1980=100	1980=100	1980=100	1980=100	2006=100	End of quarter, 3rd July 1989 = 100
1948q1	107.2	14.51	20.49	75.9	1.353	5.21
1948q2	109.0	14.60	21.07	75.5	1.400	5.05
1948q3	109.0	14.72	21.61	74.2	1.548	5.09
1948q4	110.4	14.79	22.07	74.0	1.615	4.61
1949q1	110.8	15.01	22.44	74.1	1.449	4.70
1949q2	111.1	15.01	22.04	75.6	1.484	4.28
1949q3	110.7	14.72	21.75	75.0	1.555	4.52
1949q4	106.5	14.79	21.83	72.2	1.577	4.86
1950q1	110.1	15.17	22.18	75.3	1.456	5.16
1950q2	110.1	15.51	22.25	76.8	1.512	5.26
1950q3	110.1	15.46	21.97	77.5	1.691	5.37
1950q4	110.0	16.03	22.44	78.6	1.737	5.06
1951q1	110.1	16.75	23.82	77.4	1.587	5.25
1951q2	110.1	17.25	24.83	76.5	1.652	4.81
1951q3	110.1	17.52	24.95	77.3	1.788	4.72
1951q4	110.0	17.76	25.35	77.1	1.844	4.69
1952q1	110.1	17.99	26.05	76.0	1.749	4.87
1952q2	110.1	18.00	26.02	76.2	1.722	4.65
1952q3	110.1	18.10	25.83	77.1	1.771	4.68
1952q4	110.1	18.18	25.89	77.3	1.860	4.73
1953q1	110.1	18.32	26.28	76.7	1.797	4.95
1953q2	110.1	18.16	26.16	76.4	1.783	4.77
1953q3	109.8	18.01	25.82	76.6	1.847	4.85
1953q4	109.6	18.10	25.73	77.0	2.018	4.90
1954q1	109.7	18.16	26.32	75.7	2.028	5.21
1954q2	109.7	18.25	26.36	75.9	1.976	5.34
1954q3	109.7	18.18	26.16	76.3	2.011	5.29
1954q4	109.8	18.34	26.24	76.8	2.158	5.23
1955q1	110.0	18.74	26.66	77.3	2.129	5.50
1955q2	109.9	18.99	26.62	78.4	2.061	5.62
1955q3	109.8	19.25	26.56	79.6	2.083	5.90
1955q4	110.1	19.75	26.87	80.9	2.242	6.05
1956q1	110.1	20.07	27.44	80.5	2.218	6.30
1956q2	110.0	20.24	27.68	80.4	2.160	6.40
1956q3	109.8	20.32	27.51	81.1	2.194	6.76
1956q4	109.9	20.56	27.66	81.7	2.278	7.12
1957q1	109.9	20.88	28.32	81.0	2.176	7.43
1957q2	109.7	20.61	28.26	80.0	2.173	7.01
1957q3	111.1	21.14	28.40	82.7	2.262	6.51
1957q4	113.1	21.15	28.68	83.4	2.296	6.19
1958q1	113.2	21.23	29.65	81.1	2.141	6.66
1958q2	113.1	21.23	29.90	80.3	2.116	6.90
1958q3	112.9	21.07	29.68	80.1	2.183	7.13
1958q4	113.4	21.32	29.54	81.8	2.330	7.38
1959q1	114.5	21.55	30.21	81.7	2.285	7.70
1959q2	114.7	21.55	30.02	82.4	2.313	7.92
1959q3	114.7	21.41	29.94	82.0	2.440	7.97
1959q4	114.5	21.81	30.36	82.2	2.610	8.40
1960q1	114.6	21.89	30.97	81.0	2.564	8.96
1960q2	114.6	21.83	30.96	80.8	2.577	8.81
1960q3	114.7	21.72	30.69	81.2	2.701	8.58
1960q4	114.7	21.95	30.64	82.2	2.962	8.47
1961q1	113.8	22.11	31.41	80.1	2.976	8.61
1961q2	112.1	22.44	31.49	79.9	3.074	9.09
1961q3	112.6	22.72	31.68	80.7	3.301	8.65
1961q4	112.9	23.14	32.12	81.4	3.543	8.33
1962q1	112.9	23.64	32.45	82.2	3.491	9.31
1962q2	112.7	24.08	32.89	82.5	3.520	9.15
1962q3	112.4	24.07	33.05	81.8	3.697	8.92
1962q4	112.5	25.29	33.18	85.8	3.982	8.54
1963q1	112.8	25.67	33.59	86.2	3.935	8.61
1963q2	112.7	26.02	33.96	86.4	3.971	8.67
1963q3	112.6	25.55	33.72	85.3	4.174	8.99
1963q4	112.6	25.78	34.29	84.6	4.484	9.42
1964q1	112.4	26.09	34.64	84.7	4.419	10.43
1964q2	112.5	26.55	34.88	85.6	4.423	10.60
1964q3	112.2	26.56	35.03	85.1	4.633	10.34
1964q4	112.2	27.05	35.55	85.3	4.977	9.96
1965q1	112.2	27.50	35.80	86.2	4.852	11.32
1965q2	112.4	28.00	36.09	87.2	4.804	10.86

Table C.2 (continued): Quarterly key macroeconomic indicators, non-seasonally adjusted, 1948q1-2010q2

Quarter	Nominal effective krone-rate index	Consumer price index, Denmark	Consumer price index, abroad	Real effective krone-rate index	Price index for sale of one-family houses,	Share price index
	1980=100	1980=100	1980=100	1980=100	2006=100	End of quarter, 3rd July 1989 = 100
1965q3	112.4	28.82	36.63	88.5	5.078	10.25
1965q4	112.9	29.22	37.02	89.1	5.495	10.65
1966q1	113.0	29.71	37.41	89.7	5.448	11.40
1966q2	112.8	30.32	37.64	90.9	5.481	11.91
1966q3	112.5	30.52	37.83	90.7	5.748	11.11
1966q4	112.9	31.02	38.43	91.2	6.138	10.30
1967q1	112.4	31.38	38.59	91.4	5.879	10.26
1967q2	112.4	31.79	38.75	92.2	6.084	9.72
1967q3	112.2	33.93	38.99	97.6	6.277	8.89
1967q4	110.4	34.38	39.37	96.4	6.438	9.27
1968q1	107.6	34.64	39.80	93.6	6.191	9.37
1968q2	107.6	35.64	40.02	95.8	6.261	9.72
1968q3	107.1	35.78	40.14	95.4	6.453	9.91
1968q4	107.0	35.95	40.70	94.5	6.643	10.30
1969q1	107.1	36.07	41.23	93.7	6.378	11.67
1969q2	106.9	36.47	41.65	93.6	6.541	11.39
1969q3	107.3	36.88	41.71	94.8	6.840	10.25
1969q4	105.5	37.54	42.38	93.4	7.141	10.39
1970q1	105.4	38.00	43.19	92.8	7.350	10.61
1970q2	105.0	38.57	43.75	92.6	7.430	9.99
1970q3	105.0	39.68	44.14	94.3	7.684	9.23
1970q4	105.0	40.28	44.80	94.4	8.062	9.36
1971q1	105.0	40.29	45.75	92.4	7.880	9.37
1971q2	104.1	41.17	46.43	92.3	7.946	9.11
1971q3	103.2	41.76	46.99	91.7	8.175	9.14
1971q4	103.0	42.49	47.60	92.0	8.602	9.10
1972q1	102.7	42.87	48.34	91.1	9.095	10.17
1972q2	102.4	43.80	49.04	91.5	9.522	12.35
1972q3	103.5	44.47	49.75	92.5	9.587	12.65
1972q4	105.0	45.45	50.61	94.3	10.014	17.17
1973q1	106.2	46.10	51.65	94.8	10.474	19.30
1973q2	107.4	47.57	52.92	96.5	10.769	20.68
1973q3	108.8	48.73	53.83	98.5	11.295	19.60
1973q4	108.1	50.63	55.26	99.0	11.590	17.17
1974q1	105.4	52.52	57.37	96.5	11.590	16.10
1974q2	107.6	54.52	59.08	99.3	11.196	15.53
1974q3	108.5	56.61	60.51	101.5	11.327	13.46
1974q4	109.5	58.85	62.49	103.1	12.148	13.52
1975q1	110.3	59.59	64.17	102.4	12.969	14.59
1975q2	111.5	60.77	66.11	102.5	13.429	16.37
1975q3	110.2	61.94	67.49	101.2	14.053	16.44
1975q4	109.5	61.57	68.86	97.9	14.085	18.09
1976q1	108.8	63.38	70.50	97.9	14.512	18.92
1976q2	112.3	65.89	72.10	102.6	14.676	20.21
1976q3	112.0	66.95	73.15	102.5	14.972	18.79
1976q4	113.9	69.64	74.72	106.2	15.596	18.09
1977q1	113.1	70.31	76.60	103.8	15.661	19.96
1977q2	110.7	72.54	78.60	102.2	16.646	19.74
1977q3	109.4	74.34	79.79	101.9	17.270	18.52
1977q4	107.3	78.28	80.84	103.9	18.157	17.90
1978q1	109.3	79.19	82.20	105.3	18.781	18.55
1978q2	110.0	80.46	83.66	105.8	19.536	18.34
1978q3	108.1	81.44	84.69	103.9	20.028	17.71
1978q4	110.1	83.96	85.69	107.8	20.225	16.81
1979q1	111.3	84.63	87.27	108.0	20.718	17.79
1979q2	108.6	86.76	89.20	105.6	21.670	17.40
1979q3	107.5	91.19	91.38	107.3	21.998	16.44
1979q4	106.3	93.71	93.32	106.8	21.965	15.71
1980q1	101.5	95.89	96.48	100.8	21.571	14.22
1980q2	100.1	98.78	99.20	99.7	20.915	14.60
1980q3	100.4	101.67	101.07	101.0	21.276	15.90
1980q4	97.9	103.78	103.24	98.4	21.309	17.63
1981q1	94.4	106.33	106.11	94.6	21.177	19.77
1981q2	92.3	110.87	108.79	94.0	20.324	22.92
1981q3	92.5	113.60	111.03	94.6	19.601	21.77
1981q4	93.9	116.13	113.07	96.4	19.963	24.39
1982q1	90.7	118.60	115.29	93.3	19.798	25.70
1982q2	89.4	121.43	117.55	92.4	19.963	24.98
1982q3	87.8	124.50	119.29	91.6	19.503	25.11
1982q4	90.0	127.63	120.91	95.0	19.963	27.40

Table C.2 (continued): Quarterly key macroeconomic indicators, non-seasonally adjusted, 1948q1-2010q2

Quarter	Nominal effective krone-rate index	Consumer price index, Denmark	Consumer price index, abroad	Real effective krone-rate index	Price index for sale of one-family houses,	Share price index
	1980=100	1980=100	1980=100	1980=100	2006=100	End of quarter, 3rd July 1989 = 100
1983q1	91.4	128.70	122.47	96.1	21.670	37.56
1983q2	90.2	130.53	124.22	94.8	24.395	43.23
1983q3	87.9	132.13	125.87	92.3	24.723	53.78
1983q4	87.4	134.80	127.52	92.4	25.446	58.64
1984q1	86.8	136.77	129.30	91.8	26.890	51.40
1984q2	86.5	139.20	130.93	91.9	27.449	50.81
1984q3	86.1	140.63	131.90	91.8	27.744	46.13
1984q4	86.4	142.67	133.49	92.4	28.992	45.76
1985q1	86.7	144.47	135.43	92.4	30.141	50.27
1985q2	86.6	146.67	137.36	92.5	31.520	55.58
1985q3	87.4	146.53	137.79	92.9	33.753	60.33
1985q4	88.8	147.77	138.79	94.5	34.573	65.50
1986q1	90.0	147.63	139.72	95.1	36.543	68.35
1986q2	90.3	152.47	140.28	98.1	36.675	60.63
1986q3	91.3	152.63	140.58	99.1	35.723	53.50
1986q4	93.5	154.23	141.30	102.1	36.248	52.89
1987q1	95.4	155.00	142.58	103.7	33.851	56.20
1987q2	94.7	157.47	143.75	103.7	33.785	58.11
1987q3	93.0	158.53	144.60	102.0	33.556	56.51
1987q4	93.6	160.37	145.53	103.2	33.227	49.88
1988q1	93.9	162.37	146.56	104.0	33.687	54.79
1988q2	92.7	164.70	148.19	103.1	33.588	62.60
1988q3	91.6	165.43	149.31	101.5	34.212	63.88
1988q4	91.2	167.50	150.75	101.4	34.475	74.54
1989q1	89.5	169.77	152.52	99.6	34.147	82.47
1989q2	89.2	172.53	154.91	99.4	34.212	96.00
1989q3	89.9	173.47	155.86	100.1	33.556	90.08
1989q4	92.4	175.73	157.50	103.1	33.063	99.48
1990q1	95.4	175.37	160.08	104.5	31.553	107.32
1990q2	96.6	176.73	162.48	105.1	31.684	105.83
1990q3	96.3	178.00	164.20	104.4	30.896	90.63
1990q4	96.8	179.67	166.41	104.5	30.699	86.32
1991q1	96.3	179.73	168.62	102.7	31.323	98.28
1991q2	94.0	181.43	170.46	100.1	31.717	103.02
1991q3	93.5	182.03	172.03	99.0	31.586	99.36
1991q4	94.5	183.57	173.44	100.0	31.815	96.74
1992q1	94.7	183.93	174.72	99.7	31.600	93.20
1992q2	95.0	185.87	176.63	100.0	31.600	90.11
1992q3	97.4	185.87	177.35	102.1	31.000	71.79
1992q4	100.2	185.87	178.40	104.4	30.200	71.80
1993q1	102.3	186.37	180.51	105.6	29.800	78.80
1993q2	101.6	187.70	182.12	104.7	29.600	88.42
1993q3	97.3	188.10	182.97	100.0	31.000	90.36
1993q4	98.7	189.17	183.65	101.7	32.800	100.30
1994q1	98.9	189.67	184.99	101.4	34.700	109.58
1994q2	99.2	191.47	186.44	101.9	34.700	102.74
1994q3	100.5	192.03	187.37	103.0	34.200	95.27
1994q4	100.8	193.13	188.02	103.5	34.700	95.64
1995q1	101.8	194.13	189.52	104.3	35.500	89.51
1995q2	104.6	195.83	191.00	107.3	36.800	95.84
1995q3	104.6	195.57	191.56	106.8	37.700	101.27
1995q4	104.6	196.73	191.95	107.3	38.800	106.14
1996q1	104.1	197.70	193.12	106.5	39.400	110.56
1996q2	102.5	199.70	194.45	105.2	40.400	116.35
1996q3	102.8	200.10	194.70	105.6	41.600	123.47
1996q4	102.1	201.40	195.29	105.3	43.300	136.13
1997q1	101.0	202.00	196.48	103.8	44.400	154.58
1997q2	100.4	203.80	197.61	103.5	45.600	171.71
1997q3	98.6	204.83	198.69	101.7	46.600	191.70
1997q4	99.9	205.70	199.44	103.1	47.100	210.55
1998q1	100.0	206.13	200.16	103.0	48.000	244.86
1998q2	100.5	207.83	201.41	103.7	50.000	235.69
1998q3	101.7	208.27	201.63	105.1	50.700	193.63
1998q4	102.9	209.17	201.88	106.6	51.500	219.34
1999q1	101.3	210.30	202.09	105.4	52.300	198.56
1999q2	99.9	212.57	203.51	104.4	53.100	205.43
1999q3	99.1	213.77	203.98	103.9	54.100	216.00
1999q4	98.2	215.53	204.85	103.3	54.200	255.69
2000q1	96.8	216.88	206.10	101.9	55.000	291.95
2000q2	95.5	219.44	207.57	101.0	56.500	287.53

Table C.2 (continued): Quarterly key macroeconomic indicators, non-seasonally adjusted, 1948q1-2010q2

Quarter	Nominal effective krone-rate index	Consumer price index, Denmark	Consumer price index, abroad	Real effective krone-rate index	Price index for sale of one-family houses,	Share price index
	1980=100	1980=100	1980=100	1980=100	2006=100	End of quarter, 3rd July 1989 = 100
2000q3	95.2	219.61	208.62	100.2	57.800	334.88
2000q4	94.8	221.16	209.71	100.0	58.300	313.90
2001q1	97.0	221.99	210.88	102.1	59.400	294.47
2001q2	96.2	225.07	213.29	101.5	60.200	314.62
2001q3	97.0	224.88	213.62	102.1	60.900	255.45
2001q4	97.2	225.77	213.66	102.7	60.400	272.45
2002q1	96.9	227.54	214.96	102.6	61.300	278.64
2002q2	97.3	230.18	216.55	103.4	62.500	245.99
2002q3	98.2	230.14	216.91	104.2	62.900	192.07
2002q4	98.5	231.62	217.65	104.8	62.900	199.49
2003q1	100.1	233.90	219.52	106.6	63.000	186.65
2003q2	101.6	235.45	220.10	108.7	64.300	214.90
2003q3	101.5	234.38	220.45	107.9	65.100	238.19
2003q4	101.7	234.98	221.05	108.1	65.100	244.35
2004q1	102.4	236.09	222.08	108.9	66.900	258.75
2004q2	101.7	238.00	223.98	108.0	69.400	267.43
2004q3	101.9	237.23	224.57	107.7	71.400	281.86
2004q4	102.8	238.27	225.52	108.6	72.800	286.66
2005q1	102.7	239.02	226.12	108.5	75.700	316.66
2005q2	101.8	242.02	228.03	108.0	80.100	343.97
2005q3	101.1	242.49	229.53	106.8	84.700	370.60
2005q4	100.8	243.24	230.41	106.4	89.300	393.52
2006q1	100.9	243.91	230.99	106.5	94.700	395.12
2006q2	101.7	246.85	233.53	107.5	100.600	371.01
2006q3	101.9	246.95	234.32	107.4	103.000	403.39
2006q4	102.0	247.34	234.75	107.5	102.700	441.48
2007q1	102.4	248.52	235.90	107.9	104.100	466.59
2007q2	103.1	250.87	238.59	108.4	105.500	483.69
2007q3	103.3	249.87	239.26	107.8	105.800	499.93
2007q4	104.3	252.67	241.19	109.2	103.900	464.14
2008q1	105.4	256.04	243.74	110.7	102.800	428.10
2008q2	106.5	259.64	247.22	111.8	103.700	424.30
2008q3	105.9	260.25	249.02	110.7	100.900	351.15
2008q4	105.5	260.06	247.47	110.9	93.000	247.72
2009q1	107.4	260.72	245.96	113.8	87.500	228.36
2009q2	107.6	262.93	247.31	114.4	87.900	290.70
2009q3	107.8	262.81	247.61	114.4	88.600	335.03
2009q4	108.3	263.28	248.43	114.8	88.300	336.69
2010q2	106.0	266.05	249.55	113.0	88.800	383.04
2010q2	103.4	268.49	251.55	110.4	90.900	393.02

Table C.3: Quarterly key macroeconomic indicators, non-seasonally adjusted, 1948q1-2010q2

Quarter	Broad money stock (M2)	Credit to the domestic non-bank sector extended by resident commercial banks and savings banks	Credit to the domestic non-bank sector extended by resident mortgage banks	Credit to the domestic non-bank sector extended by all resident banks	Bank's write-downs ratio
	End of quarter, million kroner	End of quarter, million kroner	End of quarter, million kroner	End of quarter, million kroner	Per cent
1948q1	8759	5690	8676	14366	0.09
1948q2	8297	5832	8715	14546	0.09
1948q3	8135	6223	8814	15037	0.08
1948q4	8119	6440	8873	15312	0.07
1949q1	8519	6774	8862	15636	0.05
1949q2	8188	6778	8910	15687	0.04
1949q3	8112	7009	9021	16030	0.04
1949q4	8326	7115	9095	16210	0.04
1950q1	8956	7365	9101	16467	0.05
1950q2	8706	7478	9171	16649	0.07
1950q3	8553	7708	9312	17020	0.08
1950q4	8638	7879	9422	17301	0.09
1951q1	9180	8210	9419	17630	0.11
1951q2	8843	8312	9480	17792	0.11
1951q3	8510	8404	9611	18016	0.11
1951q4	8845	8450	9707	18156	0.10
1952q1	9696	8605	9706	18310	0.07
1952q2	9393	8644	9771	18415	0.06
1952q3	9411	8682	9910	18593	0.05
1952q4	9574	8831	10013	18844	0.04
1953q1	10413	9108	10029	19137	0.04
1953q2	10130	9196	10116	19312	0.04
1953q3	9817	9361	10286	19648	0.05
1953q4	10174	9512	10426	19938	0.07
1954q1	10824	9744	10466	20210	0.09
1954q2	10662	10009	10585	20594	0.11
1954q3	10056	10119	10799	20918	0.10
1954q4	10132	10214	10991	21205	0.09
1955q1	10771	10255	11032	21287	0.06
1955q2	10457	10247	11157	21404	0.04
1955q3	10114	10283	11381	21664	0.03
1955q4	10515	10428	11582	22009	0.02
1956q1	11598	10558	11615	22173	0.02
1956q2	11180	10673	11734	22407	0.02
1956q3	10847	10784	11954	22738	0.02
1956q4	11260	11048	12145	23193	0.02
1957q1	12122	11410	12230	23639	0.02
1957q2	11683	11427	12413	23840	0.02
1957q3	11457	11552	12713	24265	0.02
1957q4	11893	11741	12991	24731	0.03
1958q1	12930	11884	13142	25027	0.03
1958q2	12751	12010	13418	25429	0.03
1958q3	12703	12102	13862	25964	0.03
1958q4	13701	12645	14344	26990	0.03
1959q1	15066	13115	14725	27840	0.03
1959q2	14838	13696	15183	28879	0.03
1959q3	14690	14190	15683	29873	0.04
1959q4	15402	14941	16077	31017	0.04
1960q1	16391	15651	16425	32076	0.05
1960q2	16112	16186	16832	33018	0.06
1960q3	15677	16516	17440	33956	0.07
1960q4	16235	17117	17975	35093	0.09
1961q1	17918	17885	18425	36310	0.11
1961q2	17370	18274	19045	37320	0.12
1961q3	17158	18448	19938	38385	0.11
1961q4	18029	18973	20643	39617	0.10
1962q1	19589	19766	21234	41000	0.07
1962q2	19540	20072	21880	41952	0.05
1962q3	19002	20428	22938	43366	0.03
1962q4	19623	21330	23963	45293	0.02
1963q1	21038	22046	24844	46891	0.02
1963q2	21295	22431	25732	48163	0.02
1963q3	21210	22433	27110	49544	0.04
1963q4	22264	23063	28329	51392	0.07
1964q1	24264	24013	29176	53189	0.10
1964q2	23700	25071	29977	55048	0.12
1964q3	23590	25577	31300	56877	0.13
1964q4	24939	26445	32338	58784	0.12
1965q1	26630	27845	33163	61008	0.10
1965q2	26649	28254	34490	62745	0.09

Table C.3 (continued): Quarterly key macroeconomic indicators, non-seasonally adjusted, 1948q1-2010q2

Quarter	Broad money stock (M2)	Credit to the domestic non-bank sector extended by resident commercial banks and savings banks	Credit to the domestic non-bank sector extended by resident mortgage banks	Credit to the domestic non-bank sector extended by all resident banks	Bank's write-downs ratio
	End of quarter, million kroner	End of quarter, million kroner	End of quarter, million kroner	End of quarter, million kroner	Per cent
1965q3	26478	28401	36391	64793	0.07
1965q4	27269	28964	38013	66978	0.06
1966q1	29602	30260	38606	68866	0.05
1966q2	30090	31166	39585	70751	0.05
1966q3	29574	32079	40825	72904	0.05
1966q4	30744	33261	42040	75300	0.06
1967q1	33378	35071	42750	77820	0.07
1967q2	33393	35634	43923	79556	0.08
1967q3	32778	35870	45407	81277	0.08
1967q4	33701	36342	46854	83196	0.07
1968q1	36138	37806	47705	85511	0.06
1968q2	36839	38310	49113	87423	0.05
1968q3	36386	38721	51348	90069	0.06
1968q4	38482	39517	54488	94005	0.09
1969q1	41714	41044	57456	98500	0.12
1969q2	41800	42873	59863	102736	0.14
1969q3	40584	44387	62149	106536	0.15
1969q4	42519	45420	64251	109671	0.15
1970q1	45205	46664	65676	112340	0.13
1970q2	44169	47238	67943	115181	0.12
1970q3	42740	47391	70344	117734	0.11
1970q4	43866	48475	72286	120761	0.10
1971q1	46300	50326	74309	124635	0.10
1971q2	46549	49971	77873	127844	0.10
1971q3	47736	49969	81222	131191	0.09
1971q4	48061	50626	84503	135129	0.09
1972q1	51805	52462	87076	139538	0.09
1972q2	52325	53409	90605	144014	0.10
1972q3	51888	55094	94737	149831	0.12
1972q4	55293	56934	99353	156287	0.14
1973q1	58385	60495	104274	164769	0.17
1973q2	59965	61809	108513	170322	0.20
1973q3	59568	64063	113284	177347	0.22
1973q4	62260	65744	118304	184048	0.25
1974q1	64223	69942	122275	192217	0.27
1974q2	64522	70737	126722	197459	0.28
1974q3	63618	70212	131543	201756	0.27
1974q4	67801	70405	136662	207067	0.24
1975q1	72187	72665	140757	213422	0.19
1975q2	76265	71192	147007	218199	0.15
1975q3	76469	70669	153764	224433	0.11
1975q4	85090	72336	160983	233319	0.09
1976q1	91677	77718	166718	244435	0.07
1976q2	93196	80379	171506	251885	0.06
1976q3	89699	83674	177359	261032	0.05
1976q4	94791	84479	183499	267978	0.06
1977q1	99928	88196	188805	277001	0.07
1977q2	101770	90792	193301	284094	0.08
1977q3	98668	92809	198269	291077	0.09
1977q4	104080	94469	204030	298499	0.10
1978q1	107423	99029	207528	306557	0.12
1978q2	109403	100529	213470	313999	0.13
1978q3	104786	102147	220112	322259	0.13
1978q4	111054	104735	226622	331357	0.13
1979q1	118273	107200	230430	337630	0.13
1979q2	119577	111802	236840	348642	0.14
1979q3	114740	114029	244628	358657	0.17
1979q4	122048	115692	252164	367857	0.20
1980q1	128326	118474	256073	374546	0.25
1980q2	127708	122672	261282	383954	0.29
1980q3	123690	122361	267515	389876	0.33
1980q4	131934	126431	272865	399296	0.36
1981q1	137565	127639	275094	402733	0.38
1981q2	139840	135257	278981	414238	0.42
1981q3	135936	135812	283258	419070	0.46
1981q4	145127	138000	286786	424786	0.51
1982q1	153523	142955	289194	432149	0.57
1982q2	155363	150615	291822	442437	0.61
1982q3	151976	152132	295608	447740	0.62
1982q4	162107	153492	300386	453878	0.61

Table C.3 (continued): Quarterly key macroeconomic indicators, non-seasonally adjusted, 1948q1-2010q2

Quarter	Broad money stock (M2)	Credit to the domestic non-bank sector extended by resident commercial banks and savings banks	Credit to the domestic non-bank sector extended by resident mortgage banks	Credit to the domestic non-bank sector extended by all resident banks	Bank's write-downs ratio
	End of quarter, million kroner	End of quarter, million kroner	End of quarter, million kroner	End of quarter, million kroner	Per cent
1983q1	176398	155056	305778	460834	0.57
1983q2	187989	161835	312599	474434	0.52
1983q3	187842	159347	322327	481674	0.47
1983q4	203282	168671	330713	499384	0.40
1984q1	214853	175403	339465	514868	0.32
1984q2	221451	190678	347957	538635	0.27
1984q3	217521	189847	358743	548590	0.26
1984q4	239467	194775	370526	565301	0.26
1985q1	241924	196536	382631	579167	0.30
1985q2	251347	208741	397330	606071	0.31
1985q3	248844	204709	416326	621035	0.29
1985q4	277302	229665	435131	664796	0.24
1986q1	290309	232077	453723	685800	0.16
1986q2	293322	255239	470520	725759	0.11
1986q3	278457	267099	488873	755972	0.09
1986q4	300318	301636	506278	807914	0.10
1987q1	303082	304558	518942	823500	0.14
1987q2	312681	313286	532908	846194	0.19
1987q3	292380	308274	553371	861645	0.24
1987q4	313833	330451	573485	903936	0.30
1988q1	307023	312582	589533	902115	0.36
1988q2	319247	321820	601224	923044	0.39
1988q3	306706	313831	614555	928386	0.40
1988q4	324817	323941	626893	950834	0.37
1989q1	330663	313312	637359	950671	0.32
1989q2	331379	326187	643522	969709	0.30
1989q3	322348	318975	651473	970448	0.31
1989q4	345280	343322	657441	1000763	0.35
1990q1	338930	336028	666151	1002179	0.43
1990q2	347616	342557	672013	1014570	0.47
1990q3	348781	335959	684742	1020701	0.47
1990q4	367378	361040	687590	1048630	0.45
1991q1	365366	346201	694274	1040475	0.39
1991q2	387245	357781	701192	1058973	0.39
1991q3	378776	339982	703996	1043978	0.65
1991q4	381706	359010	707128	1066138	0.65
1992q1	376327	353583	709304	1062887	0.48
1992q2	385696	358383	711569	1069952	0.48
1992q3	385215	348078	714997	1063075	0.80
1992q4	376362	347157	717292	1064449	0.80
1993q1	377080	338163	721437	1059600	0.69
1993q2	396495	337405	724594	1061999	0.69
1993q3	409484	333017	734008	1067025	0.55
1993q4	418891	321958	755063	1077021	0.55
1994q1	423158	316770	773933	1090703	0.38
1994q2	420930	319374	772014	1091388	0.38
1994q3	410484	305944	766526	1072470	0.30
1994q4	399189	301740	767967	1069707	0.30
1995q1	401502	301664	773306	1074970	0.23
1995q2	409533	308613	777722	1086335	0.23
1995q3	413649	305638	783091	1088729	0.25
1995q4	412566	311876	796982	1108858	0.25
1996q1	422579	319120	813695	1132815	0.17
1996q2	433655	327268	820774	1148042	0.17
1996q3	449093	324900	839471	1164371	0.11
1996q4	453906	329699	845358	1175057	0.11
1997q1	456826	345771	855909	1201680	0.08
1997q2	463221	355023	870602	1225625	0.08
1997q3	467026	355139	890749	1245888	0.09
1997q4	481039	359380	908862	1268242	0.09
1998q1	476040	369665	932549	1302214	0.08
1998q2	486319	387977	954782	1342759	0.08
1998q3	510983	407105	972485	1379590	0.08
1998q4	500924	407808	987462	1395270	0.08
1999q1	508971	424833	1009942	1434775	0.06
1999q2	518021	438659	1028439	1467098	0.06
1999q3	526609	432297	1045634	1477931	0.08
1999q4	519143	434895	1050699	1485594	0.08
2000q1	527992	497973	1063035	1561008	0.07
2000q2	534628	534402	1077205	1611607	0.07

Table C.3 (continued): Quarterly key macroeconomic indicators, non-seasonally adjusted, 1948q1-2010q2

Quarter	Broad money stock (M2)	Credit to the domestic non-bank sector extended by resident commercial banks and savings banks	Credit to the domestic non-bank sector extended by resident mortgage banks	Credit to the domestic non-bank sector extended by all resident banks	Bank's write-downs ratio
	End of quarter, million kroner	End of quarter, million kroner	End of quarter, million kroner	End of quarter, million kroner	Per cent
2000q3	511738	519517	1083102	1602619	0.07
2000q4	495233	526224	1095873	1622097	0.07
2001q1	495912	551958	1115611	1667569	0.10
2001q2	504216	568684	1131920	1700604	0.10
2001q3	527670	578308	1153289	1731597	0.11
2001q4	527377	588011	1191844	1779855	0.11
2002q1	526555	596647	1209207	1805854	0.10
2002q2	544456	606866	1231398	1838264	0.10
2002q3	570283	598289	1268632	1866921	0.07
2002q4	559292	599235	1285139	1884374	0.07
2003q1	574829	655399	1322593	1977992	0.10
2003q2	599042	663357	1352003	2015360	0.10
2003q3	605811	656771	1376082	2032853	0.09
2003q4	600513	662944	1394550	2057494	0.09
2004q1	637179	691738	1426629	2118367	0.05
2004q2	653465	720409	1455051	2175460	0.05
2004q3	670347	723651	1472136	2195787	0.00
2004q4	676715	754760	1489948	2244708	0.00
2005q1	697766	799371	1529586	2328957	0.00
2005q2	763535	859415	1579089	2438504	0.00
2005q3	779694	878575	1629910	2508485	-0.02
2005q4	775991	920088	1664379	2584467	-0.02
2006q1	815132	971040	1709157	2680197	-0.02
2006q2	839990	1030265	1753725	2783990	-0.02
2006q3	842185	1052858	1799246	2852104	-0.03
2006q4	860166	1121922	1834777	2956699	-0.03
2007q1	910330	1181458	1875052	3056510	-0.01
2007q2	932610	1222089	1920876	3142965	-0.01
2007q3	954543	1249075	1967389	3216464	0.00
2007q4	972764	1333638	2015527	3349165	0.01
2008q1	1004802	1374087	2057954	3432041	0.11
2008q2	1001272	1423491	2102403	3525894	0.11
2008q3	992341	1438650	2136823	3575473	0.12
2008q4	1059977	1546256	2164613	3710869	0.67
2009q1	1055207	1506972	2202652	3709624	0.50
2009q2	1045830	1462125	2236800	3698925	0.50
2009q3	1031798	1391200	2265600	3656800	0.59
2009q4	1023080	1359100	2278800	3637900	0.59
2010q1	1013400	1347200	2293300	3640500	0.31
2010q2	1013100	1388300	2315200	3703500	0.31

Annex D: VAR models estimated on the basis of annual data 1948-2009

This annex illustrates the response to a one-standard-error structural shock to the discount rate obtained via an estimation of the three VAR models from section 6 on annual data 1948-2009.

The annual data has been derived from the quarterly data sets presented in section 3 and 4. The annual data for real GDP and the bank's write-down ratio refer to the sum of the quarterly data within the year. The annual data for the CPI, the discount rate, the yield on long-term central-government bonds and for house prices refer to the annual averages of the quarterly data within the year. For the rest of the variables, the annual data are equal to the observation in the fourth quarter of the year.

Table 5.A: Specifications of three VAR models. Estimated on the basis of annual data 1948-2009

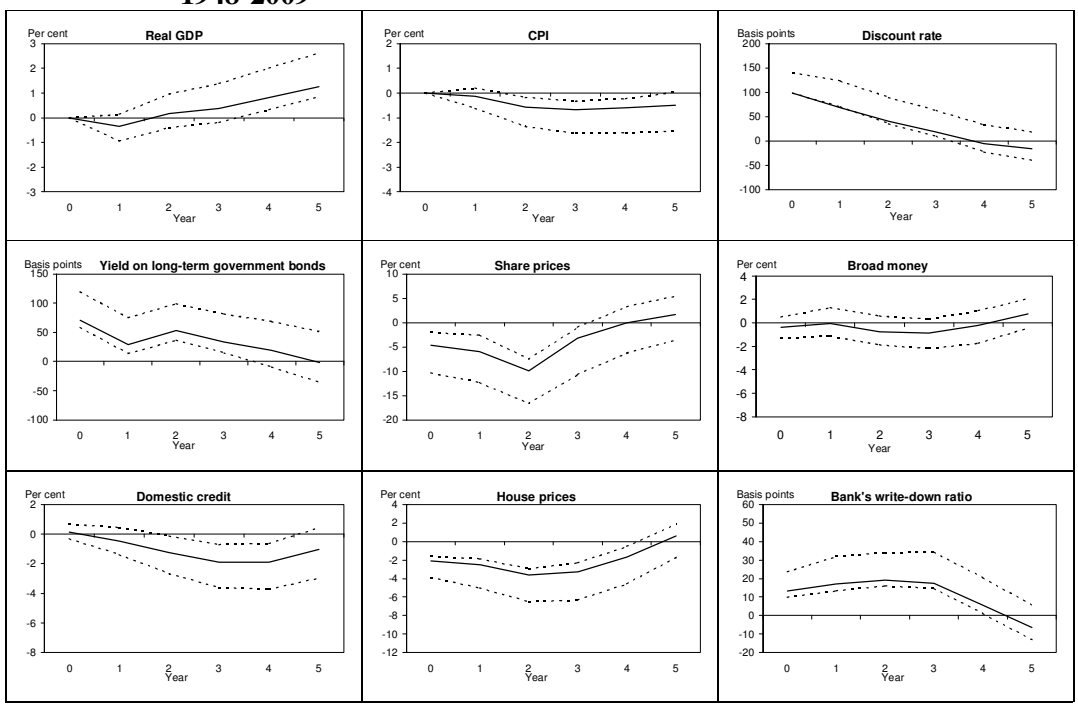
Model	L (Levels)	LA (Levels, Alternative ordering)	D (Differences)
Endogenous variables listed in order	1. Real GDP (log-level) 2. CPI (log-level) 3. Discount rate (level) 4. Yield on long-term central-government bonds (level) 5. Share prices (log-level) 6. Broad money (log-level) 7. Domestic credit (log-level) 8. House prices (log-level) 9. Bank's write-down ratio (level)	1. Discount rate (level) 2. Yield on long-term central-government bonds (level) 3. Share prices (log-level) 4. Broad money (log-level) 5. Domestic credit (log-level) 6. House prices (log-level) 7. Bank's write-down ratio (level) 8. Real GDP (log-level) 9. CPI (log-level)	1. Real GDP (dlog_1) 2. CPI (dlog_1) 3. Discount rate (d_1) 4. Yield on long-term central-government bonds (d_1) 5. Share prices (dlog_1) 6. Broad money (dlog_1) 7. Domestic credit (dlog_1) 8. House prices (dlog_1) 9. Bank's write-down ratio (d_1)
Deterministic terms	Constant terms Linear time trends	Constant terms Linear time trends	Constant terms
Optimal endogenous lags from AIC (a)	5	5	5
Chosen number of endogenous lags	2	2	1
Vector F-tests for auto-correlation (p-value) (b)	0.0238	0.0238	0.2786

General notes: d_1 denotes first differences whereas dlog_1 denotes first logarithmic differences.
(a) Among models with a maximum of 10 endogenous lags.
(b) Up to the chosen number of lags in the models. Null hypothesis is no autocorrelation.

Due to the more limited degrees of freedom in the annual data sets, the models have been estimated with fewer lags of the endogenous variables than in the quarterly models, cf. table 5.A. However, in all the annual models there are no signs of autocorrelation in the residuals at a one per cent significance level measured by vector diagnostics for autocorrelation.

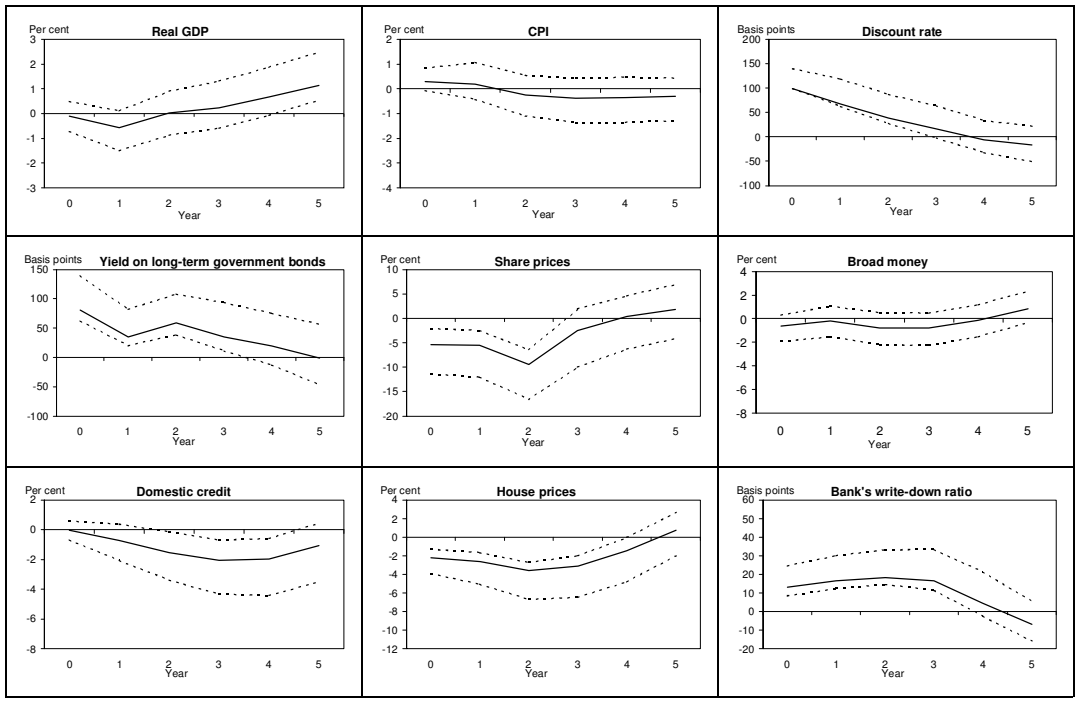
The responses to a one standard error shock to the discount rate in the three annual models are shown in the Charts below.

Chart 22.A: Responses to a one standard error shock to the discount rate - Model L (Levels). Estimated on the basis of annual observations 1948-2009



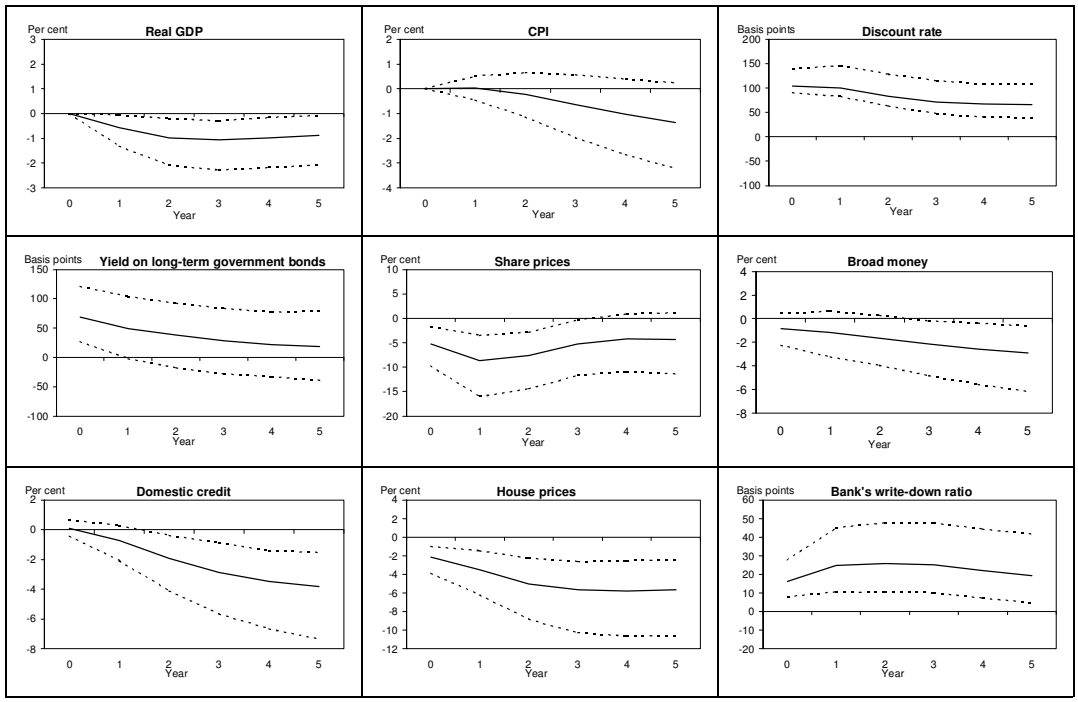
General notes: Dashed lines are 95 per cent bootstrapped confidence intervals calculated using 500 repetitions of Hall's percentile method. The orthogonalised impulse-response functions show deviations from the underlying baseline in per cent, except for interest rates and the bank's write-down ratio, which show derivations from the baseline in basis points. Sample: Annual data 1948-2009.

Chart 23.A: Responses to a one standard error shock to the discount rate - Model LA (Levels, Alternative ordering). Estimated on the basis of annual observations 1948-2009



General notes: Dashed lines are 95 per cent bootstrapped confidence intervals calculated using 500 repetitions of Hall's percentile method. The orthogonalised impulse-response functions show deviations from the underlying baseline in per cent, except for interest rates and the bank's write-down ratio, which show derivations from the baseline in basis points. Sample: Annual data 1948-2009.

Chart 24.A: Accumulated responses to a one standard error shock to the discount rate - Model D (Differences). Estimated on the basis of annual observations 1948-2009



General notes: Dashed lines are 95 per cent bootstrapped confidence intervals calculated using 500 repetitions of Hall's percentile method. The accumulated orthogonalised impulse-response functions show accumulated deviations from the underlying baseline in per cent, except for interest rates and the bank's write-down ratio, which show accumulated derivations from the baseline in basis points. Sample: Annual data 1948-2009.