

2.2 A DESCRIPTIVE ANALYSIS OF THE LUXEMBOURG FINANCIAL STRUCTURE: 1998-2001

2.2.1 Introduction

The importance of the financial activities and services is impressive considering Luxembourg's origin as primarily a steel-based economy. At the end of the year 2001, the financial sector represents more than 10% of the total employment. Luxembourg was able to build its role in financial services by continuously adapting to a changing market. With an initial focus on Euromarkets, and a subsequent broadening to international and syndicated loans, Luxembourg banks have now turned to investment fund administration and private banking.

Luxembourg's financial centre plays a major role in fund administration. It held the first rank in Europe in 2001 and second rank worldwide, after the USA. Private banking and international syndicated loans are other important sources of business. Luxembourg's financial centre ranks fourth in Europe in terms of non-resident deposits from the non-bank sector, and third in terms of non-resident loan volumes to the non-bank sector.

Insurance and re-insurance companies are also very active in Luxembourg. The activity of the Luxembourg stock exchange is marginal as compared to the most important European stock exchanges.

The aim of this paper is not to rigorously test specific hypotheses. Rather, it tries to provide an overview of Luxembourg financial structures during the few past years, focusing on the activities involved and its evolution before and after the adoption of the European single currency. By comparing the financial system in different periods, it is possible to identify the main forces driving the Luxembourg financial structures.

The indicators of size and activity also suggest a clear pattern. Despite increasing efficiency and liquidity of the Luxembourg stock market, it remains relatively small and underdeveloped. The Luxembourg financial system seems to be a rather bank-based system. This result suggests that the traditional channel of monetary policy transmission through the banking balance sheet still maintains a dominant role in Luxembourg.

Unfortunately, this analysis is constrained by the non-availability of Luxembourg Financial Accounts data. This reflects the absence of statistics on the Monetary Union Financial Accounts (MUFA), on the volume of bonds issued by companies, on the capital account of the balance of payments, etc.

2.2.2 Overall description of main features and recent developments of the Luxembourg financial system

Luxembourg is one of the largest international financial centers, with credit institutions playing a dominant role. At the end of December 2001, there were 189 banks registered in Luxembourg. Few of these are active on the domestic market, while the great majority are subsidiaries or branches of major European institutions, focusing their activities on international markets. This complicates any comparison with the banking systems of other European countries. Table 1 reports the number of banks registered in Luxembourg, their geographical origin and the number of banks per 100,000 residents.

Table 1 Number and origin of banks (end of year)

	1998	1999	2000	2001
Belgium/Luxembourg	27	27	25	24
Germany	64	65	61	58
United States	7	7	9	9
France	18	18	16	15
Italy	22	23	21	21
Japan	9	9	5	5
Scandinavia	11	11	10	10
Switzerland	15	13	15	13
Other countries	36	37	40	34
Total	209	210	202	189
Banks per 100,000 residents*	49	49	48	47

Source: BCL.

Table 1 indicates that Luxembourg has a very high number of banks per capita – 47 for hundred thousand residents. This number reflects the deep internationalisation of the Luxembourg banking system and its integration in European financial markets. At the end of December 2001, around 84% of inter-bank lending were granted to foreign banks, of which 13% were allocated to subsidiaries or parent companies. Around 80% of lending to non-banks (households, non-financial corporations and public entities) were granted to foreign customers. On the liabilities side, the share of foreign inter-bank debt was around 83%.

Luxembourg is also an important international centre for investment funds. It ranks second in the world following the USA in terms of value of funds under

administration, with a share of the European Union market above 20%. In terms of funds managed and distributed internationally it is actually ranked first.

In order to diversify the core activities of the Luxembourg financial system, efforts are made to develop new financial activities. The government has put into place a legal basis for international pension funds. At the end of 2001, 7 pension funds were authorised to operate in Luxembourg.

The insurance and reinsurance market is very active in Luxembourg. By the end of 2001, around 93 insurance companies and 264 reinsurance companies had chosen Luxembourg as their base.

In 2001, trading volumes on Luxembourg's stock exchange reached record highs, especially for shares in Luxembourg based companies and for bonds syndicated by local banks. However, trading volumes remained low when compared to international standards.

The stock market concluded a cross-membership and cross-access agreement with Euronext¹⁰ on November 16, 2000. This agreement allowed members of the Luxembourg exchange to access Euronext securities via the unified system architecture through remote membership links. In 2001, international bonds represented 70% of the total listing of Luxembourg's stock exchange.

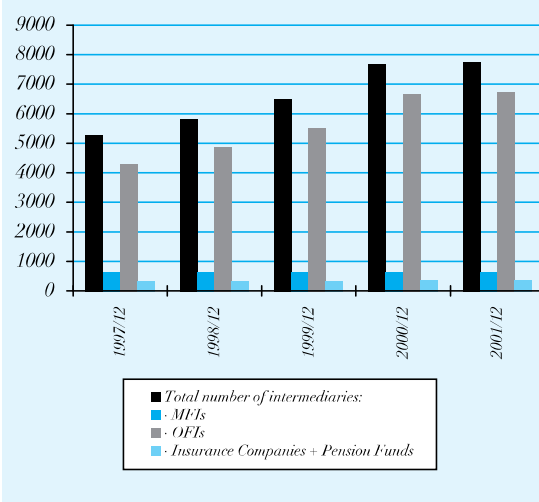
2.2.3 Intermediaries

2.2.3.1 General description of financial intermediaries

In 2001, a total of 8,070¹¹ units were registered, of which 618 were monetary financial intermediaries (MFIs), 7,090 were other financial intermediaries (OFIs), 5 were pension funds and 357 were insurance companies. Of the insurance companies, 264 were re-insurance companies and 2 were pension insurance companies. Despite the fast growth of the total number of financial intermediaries during the past five years, a closer look at the individual components reveals that the number of credit institutions is decreasing. In fact, between 1998

and 2001, the number of banks fell from 209 to 189. Mergers and acquisitions explain most of this phenomenon, while activity in the banking sector has kept growing.

FIGURE 3.1
NUMBER OF FINANCIAL INTERMEDIARIES



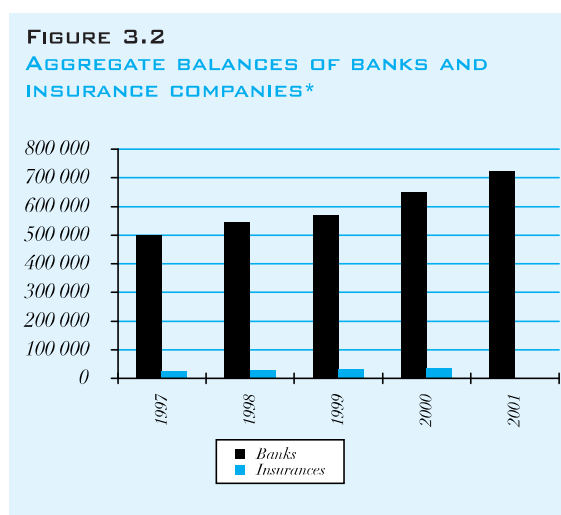
Source: BCL and Commissariat aux assurances

Financial activities in Luxembourg are mainly based on the banking sector. In the 1970s, a number of European banking groups created Luxembourg subsidiaries in order to gain access to the market in euro-currencies, an outgrowth of regulatory limitations and the existence of minimum reserve requirements in their respective home countries. Within a period of less than five years, fifteen subsidiaries of major European banking groups, primarily of German origin, began operating in Luxembourg. With the growth of the Euro-bond market, the Luxembourg financial centre emerged as a major centre for these activities. The Euromarket, which began as a deposit activity, stimulated the growth of international syndicated loans in Luxembourg.

¹⁰ On 22nd of September 2000, Euronext exchange was born from the merger of the exchanges of Amsterdam, Brussels and Paris. On January 30th 2002, Portugal's Lisbon exchange joined the Euronext.

¹¹ This number excludes holding corporations and professionals of the financial sector (PFS).

Figure 2 illustrates the aggregated end-of-year balance sheets of insurance companies and banks. Despite the high number of banks and insurance companies operating in Luxembourg, most of them are relatively small.



Source: BCL and Commissariat aux assurances, * Data on aggregate insurance companies' balance sheets is not available for 2001 yet.

2.2.3.2 Channelling of funds through intermediaries

The increasing variety of available investment instruments is likely to reduce the share of savings held as deposits with intermediaries. However, Luxembourg's aggregated balance sheet of credit institutions indicates that the volume of bank deposits actually continues to increase, especially through business with non-EMU countries. The share of Luxembourg households in banking liabilities increased by 2% (from 1998 to 2001), while non-financial corporations invested heavily in banking assets (+47%). This development seems contrary to the global trend towards dis-intermediation of financial services. At the end of 2000, Luxembourg ranked third in Europe in terms of external loans to the non-bank sectors after the UK and Germany, and fourth in non-resident deposits after the UK, Switzerland and Germany¹².

Table 2 *Financial assets (acquisition & holding) in the form of intermediation oriented instruments by sector*

	<i>As a percentage of GDP</i>	
<i>Stock</i>	<i>MFIs</i>	<i>MFIs</i>
<i>Net financial transactions of</i>	<i>1998</i>	<i>2001</i>
Households	75.8	77.2
Non-financial corporations	41.8	58.6
Financial corporations	649.8	749.6
Government	27.3	22.1
Rest of the world (EMU)	1149.6	1194.1
Rest of the world (non-EMU)	879.7	1044.5
Total	2,824.1	3,146.1

Source: BCL.

¹² *BIS Quarterly Review: International banking and financial market developments, March 2002, P. A13*

2.2.3.3 MFIs

Unlike in most European countries, the financial sector in Luxembourg is the major contributor to the GDP growth (in 2001 it represented more than 20% of gross value added). Among the credit institutions in Luxembourg, two institutional groups can be distinguished: commercial banks and banks issuing mortgage bonds. Commercial banks are mostly incorporated enterprises, often focused on universal banking services. The second type of banks is specialised in the issuance of mortgage-based bonds (*lettres de gage*).

The legal framework for Luxembourg's *lettres de gage* was created at the end of 1997 and is based on the German Pfandbrief model. The *principal* activities of credit institutions, being allowed to issue *lettres de gage*, are limited to estate and property financing as well as loans granted to or guaranteed by public authorities. In addition, banks issuing mortgage bonds may engage in *auxiliary* banking and financial activities, such as collecting deposits, borrowing external funds, administration and management of clients' accounts.

Furthermore, these banks are only allowed to refinance their principal activities on the market by issuing mortgage-based bonds. This provides added security to the bearer of the mortgage-based bonds, as the mortgage banks are not allowed to change their *principal* activities over time. Due to the high level of protection, *lettres de gage* have a lower risk weighting, as imposed by the Solvency Directives¹³. *lettres de gage* are also eligible as collateral in liquidity-providing reverse transactions with the Eurosystem. In fact, *lettres de gage* are characterised by a great flexibility when compared to the German Pfandbrief. This difference is mainly related to Luxembourg banks' international diversification possibilities. The underlying public loans may originate from issuers in the OECD area when 97% of public sector debt is rated AA or better, whereas the collateral underlying the German Pfandbrief has to be located in the EEA or Switzerland.

At the end of 2001, three Luxembourg banks were granted the status of mortgage banks by the Luxembourg authorities. They accounted for more than 3% of the total assets held by the Luxembourg's banking sector.

Table 3 Number of MFIs divided into different categories

	1998	1999	2000	2001
Total number of MFIs	618	140	654	618
Breakdown in category (1):				
Incorporated enterprises limited by shares	139	140	135	140
Co-operative enterprises	2	2	2	2
Branches with head-office:				
in EEA countries	61	60	55	54
in non-EEA countries	7	8	8	7
Other credit institutions	0	0	0	0
Money Market funds	409	424	452	429

Source: BCL

¹³ 89/647/CEE and 93/6/CEE directives.

Among MFIs, banks dominate the balance sheets in terms of size while money market funds do so in terms of number of units. However, the total capitalisation of money market funds continues to rise faster than bank assets. The amount of capital invested in money market funds increased by more than 199% from 1998 to 2001, mainly explained by the merger of resident funds with several foreign funds. The level reached represents slightly more than 15% of bank deposits, while in 1998 it amounted to only about 7%. As illustrated in Table 4 Luxembourg's MFI sector has become

increasingly concentrated. In 1998, the top five banks held on average just over 26 million euro in assets, while in 2001, they held over 40 million euro. This evolution resulted in a gain of market shares for the five largest banks, which explains to a large extent the degree of the market concentration. Moreover, the number of banking entities fell by 3% over three years, while total assets handled by all banks rose about 51% in nominal terms. Combining the increase in total banking assets with the smaller number of banks yields a 23% increase in the size of the average bank.

Table 4 Concentration index, aggregate market shares and average size of the five largest banks

year	Herfindahl index	Share of Top 5 banks in total assets	Average size of top 5 Total assets (million euro)
1998	0.0222	24.58%	26,588
1999	0.0236	26.08%	31,219
2000	0.0242	26.27%	33,269
2001	0.0278	28.19%	40,328

Source: BCL.

The moderate concentration that characterises the Luxembourg banking sector raises the question whether this activity is controlled by an oligopoly. One way to address this question is the structure-conduct-performance model (SCP). According to this view of market structure, the concentration of producers is the primary determinant of both conduct and performance. Bain (1958)¹⁴ argues that high levels of producers' concentration, protected high entry barriers, will induce firms to engage in price collusion, which inevitably will impede efficient allocation of resources as well as learning.

According to Blair (1972)¹⁵ one of the leading proponents of the SCP theory, oligopoly begins when the four largest firms hold more than 25% of overall sales. Between 25% and 50%, this oligopoly is loose and unstable, but above 50%, it becomes firm and clearly established. If we use this criterion, we would have to conclude that the Luxembourg banking sector is in its

first step to becoming oligopolistic. In fact, the top four credit institutions hold about 22% of the total assets in 2001, while they were controlling only about 19% of the total assets at the end of 1998. These results reinforce the idea that the consolidation phenomena observed during the past few years may lead to slightly higher prices for consumers, as well as to a reduction in banking efficiency. However, this conclusion does not square well with the fact that the banking industry in Luxembourg is characterised by continuous international price competition.

The Herfindahl-Hirschman concentration index¹⁶ suggests a slight increase in concentration during the period under investigation. However, its level is still low compared to other countries because most of Luxembourg's banking activity is oriented to the international market for banking services. Luxembourg's domestic market is actually served by only a few banks.

¹⁴ Bain (1958) : *Industrial Organization*, New York : John Wiley and Sons Inc Ed.

¹⁵ Blair (1972) : *Economic concentration*, New York : Harcourt Brace Jovanovich Ed.

¹⁶ Total assets are used as a proxy for overall bank activity to determine the Herfindahl-Hirschman index (HHI). Individual market share per bank is calculated as the ratio of the individual bank's total assets to the sum of all Luxembourg banks' total assets. The HHI calculated on basis of deposits and loans yields similar results. The maximum value of the HHI in the case of monopoly is 1.

Table 5 Aggregated balance sheet of credit institutions (MFI statistics, end of year)

As a percentage of total assets

	1998			2001		
	Total	Residents	ROW	Total	Residents	ROW
Assets						
Loans	71.0	14.2	56.8	70.8	14.5	56.3
Securities other than shares	24.1	1.0	23.1	22.6	1.0	21.6
Shares	1.3	0.5	0.8	1.9	0.5	1.4
Fixed assets	0.5			0.5		
Remaining assets	3.0			4.2		
Liabilities						
Deposits	83.3	24.2	59.1	79.6	25.0	54.6
Securities other than shares	8.5	4.0	4.5	11.1	6.2	4.9
Capital & Reserves (own shares)	2.5			5.2		
Remaining liabilities	5.6			4.1		
Total assets as a % of GDP	3 192			3 396		

Source: BCL

The aggregated balance sheet of credit institutions reported in Table 5 reveals that Luxembourg banks rely largely on deposits. Indeed, deposits remain the major source of bank funding and the proportion of liabilities accounted for by deposits remains stable around 80%, 60% of which were inter-bank deposits. However, the share of deposits from non residents decreased from roughly 59,1% in 1998 to 54,6% in 2001. During the same period, the share of deposits from residents remained stable at around 25%.

On the assets side almost 53% of loans in 2001 were granted to Euro area residents. The share of loans granted to the local economy remained rather stable at 20%, while the share granted to the rest of the world experienced a small decline, in terms of stock, of almost 1%. This is in line with the level of banks' business denominated in the single European currency. In 2001, 58% of the Luxembourg banks' business was carried out in euro, increasing by 5% from 2000. Despite the increasing share of business being done in euro in 2000, this level remained lower than the level observed in the majority of the Euro area countries, which are close to or in excess of 75%. However, this evolution makes the euro the most important currency for banks in Luxembourg.

Newly granted mortgage loans for property located in Luxembourg only represented 3% of total resident loans in 2001. This share remained relatively stable during the period under investigation. The interest rate for these loans is mainly of a variable nature. The average interest rate charged by Luxembourg banks was 5.5% in 2001, while it was 5.8% in 2000 and 5.0% in both 1999 and 1998.

The attractiveness of mortgage loans was enhanced by tax deductions, which were 1500 euro per year and per person living in the household for the first five years of the mortgage. This deduction is progressively reduced down to 750 euro for dwellings occupied for 10 years or longer.

The aggregated balance sheet of Money Market Funds (MMFs), see Table 6, gives a similar picture of the geographic distribution of assets. In fact, more than 61% of assets were granted to EMU zone residents in 1998 and more than 25% in 2001. Comparing deposits coming from EMU countries and loans granted to EMU customers reveals that Luxembourg based MMFs were a net credit provider to the Euro-zone economy.

Table 6 Aggregated balance sheet of money market funds (MFI statistics, end of year)

As a percentage of total assets

	1998			2001		
	Total	Residents	ROW	Total	Residents	ROW
Assets						
Loans	18.0	7.3	10.7	20.4	4.1	16.3
Securities other than shares	62.0	0.0	62.0	70.4	3.7	66.7
Remaining assets	20.0			9.2		
Liabilities						
Money Market Fund shares/units	83.3			97.8		
Remaining liabilities	16.7			2.2		
Total assets as a % of GDP	217.0			417.7		

Source: BCL.

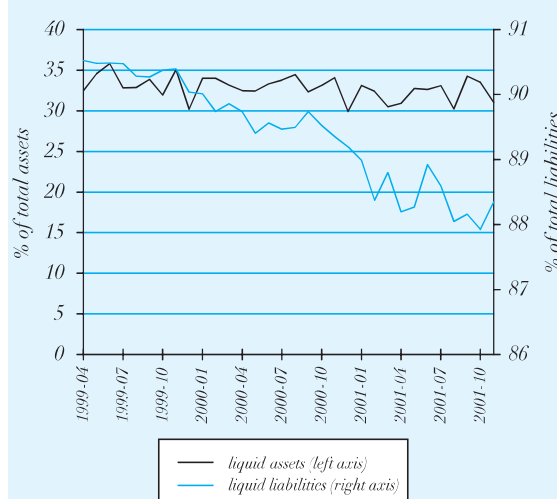
It should be stressed that the activity of the money market funds is, in economic terms, inherently an activity of the credit institutions. Thus, one can assume that the development of the money market funds enabled the Luxembourg banks to offer products, which are more attractive than the traditional financial intermediation products (i.e. deposits). Several factors contributed over the last years to create a context eminently favourable to the short term collective investments (the small difference between the long and the short rates, mistrust of the investors with respect to the shares since the bursting of the stock exchange bubble in 2000).

Furthermore, the money market funds are indirectly present on the inter-bank market. Indeed, 95% of the loans appearing on their balance sheets in 2001 were granted to credit institutions. The funds, which the money market funds have deposited with credit institutions (mainly their parent company), are not negligible. Indeed, these account for some 3% of money market funds' total assets. The volume of securities other than shares issued by MFI which were held by the money market funds amounts to EUR 18.257 billion which represents around 20% of their total assets. One may conclude from the above figures that money market funds have supported banking over the past few years, as traditional financial intermediation products have become less attractive.

Two indicators may be used to determine both the impact of financial structure on bank balance sheet and performance. These indicators could be a useful

tool for analysing the transmission of the single monetary policy in Luxembourg. In fact, if bank liabilities indeed decline after a monetary tightening, banks may sell liquid assets instead of reducing loan supply to carry out the decline in total assets. Monetary policy tends to have a stronger impact on less liquid banks, because these banks will have to restrict lending in order to avoid their ratio of liquid assets to total assets to fall to an undesirable low level.

FIGURE 3.3
LIQUID ASSETS AND LIABILITIES
1999-2001

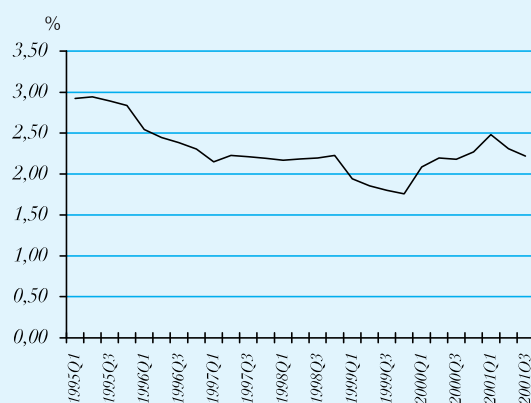


Source: BCL

Liquid assets include inter-bank loans and bonds issued by OECD governments and companies. On the liabilities' side, two main sources of funds can be distinguished: deposits and borrowing. Borrowing includes all debts, excluding subordinated debts. As illustrated in the monthly balance sheet figure, it appears clearly that the Luxembourg banks' liabilities display a decreasing trend during the period of April 1999 to May 2001, a period in which Eurosystem decisions have taken the form of monetary policy tightening. However, during the same time, liquid assets were characterised by a substantial stability. This finding is in line with the results for Italy reported by Gambacorta (2001), who found that the main factor enabling banks to contain the effect of the fall in deposits on lending was their degree of liquidity¹⁷. As illustrated in figure 3.4, the net interest rate margins (defined as seasonally adjusted quarterly banks' net interest income divided by the sum of loans and securities other than shares) charged by Luxembourg banks remains relatively low when compared to the other European countries (see Huizinga, 2001)¹⁸. Thus, the net interest rate margin is an ex post interest margin that differs from the ex ante interest margin, the latter being simply calculated as the loan interest rate minus the deposit interest rate, because of possible loan defaults. So, low ex post interest

margins can reflect low loan default rates. Apart from little loan defaults, low interest margins in Luxembourg may be explained by strong competitive pressures in the international banking market and good cost management of Luxembourg banks, as well as the fact that a large share of Luxembourg credit institutions' business is based on inter-bank activities. At the end of 2001, 50% of total deposits and 71% of loans were vis-à-vis other banks.

FIGURE 3.4
THE LUXEMBOURG BANKS' NET INTEREST MARGIN 1995-2001



Source: BCL

¹⁷ Gambacorta, L. (2001): *Bank-specific characteristics and monetary policy transmission: the case of Italy*, ECB-Working paper n° 103, December.

¹⁸ H. Huizinga : "EMU and Financial market structure", European Commission, Workshop on The Functioning of EMU: challenging of the early years", March 2001.

2.2.3.4 Other financial intermediaries

Other financial intermediaries include all financial corporations and quasi-corporations incurring liabilities in forms other than currency and deposits. Luxembourg's mutual funds dominate this sector both in number and in size. At the end of 2001 fund assets under administration in Luxembourg exceeded 928 billion euro. These were administered by 83 fund administrators, among whom the top ten account for two-thirds of total assets. The investment fund administration is more concentrated than other financial intermediaries. This is because all but a fraction of fund administrators concentrate on in-house funds¹⁹. This is especially true

for Swiss banks, which are still the biggest source of Luxembourg-domiciled funds (see the table below).

As illustrated in table 7, at the end of 2001, the number of funds is slightly above 1,900. They represent a total of 7,519 compartments. More than 43% of all new compartments are equity funds. In part, this success reflects the fact that Luxembourg was the first Member State to implement the European Union's 1985 directive on UCITS (Undertakings for the Collective Investment in Transferable Securities) allowing cross-border sale of investment funds in the EU using a "single passport".

Table 7 *Number of new funds divided into different categories*

	1998	1999	2000	2001
Equity funds	544	690	965	658
Bonds funds	523	496	411	360
Mixed funds	210	159	148	146
Monetary funds	31	17	25	19
Funds of funds	83	147	320	281
Other funds	12	24	16	33
Total of new compartments	1403	1533	1855	1497
Total of compartments	5178	5836	6995	7519
Total of mutual funds	1,521	1,630	1,785	1,908
Securities and derivatives dealers*	83	90	113	145

* no separate data available for securities and derivatives dealers and financial corporations engaged in lending.

Source: BCL and CSSF, annual report 2001

¹⁹ A credit institution charged to manage and administrate funds belonging to other financial institutions in addition of their own funds.

As for the sources of funds domiciled in Luxembourg, the table 8 below displays the geographical origin of fund promoters and the share of total assets in December 2001.

Table 8 *Geographical origin of fund promoters at the end of 2001*

<i>Origin of fund promoters</i>	<i>Share of total assets</i>
Switzerland	25.5%
USA	17.9%
Germany	16.7%
Italy	10.6%
Belgium	8.7%
UK	6.1%
France	5.1%
Japan	2.2%
Sweden	1.7%
Netherlands	1.7%
Others	3.8%

Source: CSSF, annual report 2001.

Luxembourg's UCITS were especially attractive because of the aforementioned swift implementation of the 1985 EU directive, the rapid decision making process of

the relevant supervisory bodies, the availability of a wide range of different institutional forms for investment funds, the diversity of financial instruments allowed for investment, Luxembourg's bank secrecy laws, and because Luxembourg does not impose a withholding tax on non-residents, a characteristic it shares with the other EU countries. The impact of the Feira agreement²⁰, which aims to apply a minimal tax rate on savings of all EU residents and encourages national authorities to exchange information on savings income remains uncertain at this time.

2.2.3.5 Insurance and pension funds

Insurance activities in Luxembourg are dominated by subsidiaries of European insurance groups. EU cross-border business accounts for more than 90% of premium income. Life insurance dominates the sector, with 62% of total premium income and 59% of total assets. Life insurance companies also dominate direct insurance activities in terms of the numbers of units operating (see table 9). Although re-insurance companies are more numerous, their total assets represent only 50% of total assets in direct insurance.

Table 9 *Number of insurance companies divided into different categories*

	1997	1998	1999	2000	2001
Direct insurance companies	91	93	94	93	93
Life insurance companies	50	53	56	55	54
Non-life insurance companies	21	21	21	23	23
Pension insurance companies	01	01	01	01	02
Foreign branches	19	18	16	14	14
Pension funds (source: CSSF)	0	0	0	4	05
2. Re-insurance companies	255	255	257	264	264
Total	346	348	351	357	362

Source: Commissariat aux assurances and CSSF

²⁰ Santa Maria Da Feira European Council: Presidency Conclusions, 19 and 20 June 2000

Table 10 describes insurance and re-insurance companies' aggregated balance sheet in 1998 and 2000. The insurance sector's investment policy was more aggressive in 2000 than in 1998. This is mostly true for re-insurance companies, whose investment policy concentrated on the equity market. They are primarily exposed to equities (33%), debt securities (24%) and investment in related companies (19%). As life insurance companies, were more risk averse, preferring EU government secu-

rities (64%) and private sector bonds (19%) to shares (4%). Contractual savings (pension funds and life insurance companies) are illiquid assets. These funds are usually available to asset holders only upon the occurrence of particular events (e.g. retirement, death, or disability). Other institutional investors, such as non-life insurance companies, mobilise a considerably smaller volume of savings. Their share in total assets of direct insurance balance sheet represents less than 10%.

Table 10 *Aggregated balance sheet for insurance and re-insurance companies**

As a percentage of total assets

<i>Assets</i>	<i>1998</i>	<i>2000</i>	<i>Liabilities</i>	<i>1998</i>	<i>2000</i>
Deposits with banks	10.2	8.9	Technical reserves	84.7	88.2
Securities other than shares	51.9	38.8	Remaining liabilities	15.3	11.8
Shares	19.9	35.8			
Loans	2.8	2.2			
Remaining assets	15.1	14.3			
Total assets as a % of GDP	169	192			

*Source: Commissariat aux assurances; BCL aggregation; * data on aggregate insurance companies' balance sheets is not available for 2001 yet.*

In 1999, the government created a legal framework for international pension funds. Promoters may choose among two kinds of vehicles, which are to be registered and supervised by the Commission de Surveillance du Secteur Financier (CSSF).

Firstly, the new law envisages a new type of co-operative savings/pension institution with variable capital, i.e. SEPCAVs (Société d'Épargne Pension à Capital Variable). This new hybrid type of institution combines the characteristics of a co-operative entity (in that it obeys the principles of variable capital and variable composition of associates, as well as that of non-transferability of parts) with those of a public limited company. However, unlike the public limited company, the new hybrid type benefits from certain tax exemptions and faces limitations with respect to its area of activity.

Secondly, ASSEPs (Association d'Épargne-Pension). This type of pension fund is a commercial entity with a legal personality. It combines characteristics of non-profit associations with those of commercial organisations. Members affiliated to an ASSEP, as well as beneficiaries, hold rights in the form of claims. At the time of

retirement, beneficiaries either receive capital gains or payment according to a pension scheme.

SEPCAVs and ASSEPs are subject to different fiscal regimes. SEPCAVs are subject to full taxation according to the company income tax, local commercial tax and wealth tax; however, they are exempt from income generated by securities as well as capital gains realised by transferring securities.

ASSEPs are equally subject to the business income tax and local commercial tax but are required to build provisions for pension commitments, which are deductible against tax. Thus, ASSEPs do not hold any taxable wealth but earn financial revenues in the form of contributions that are compensated by their deductible provisions.

On 31 August 2000 a third type of pension vehicle was introduced to improve access to contractual savings. Unlike SEPCAVs and ASSEPs, this third vehicle is an insurance instrument and operates under the authority of the Commissariat aux assurances. It can take four legal forms: mutual insurance association, co-operative society, co-operative society organised as a limited company or non profit-making association.

At the end of 2001, two pension funds have been authorised by the Commissariat aux assurances and five by the CSSF.

2.2.4 Markets

The Luxembourg stock exchange was founded in 1928 as a private company by the issuance of shares, which were subscribed by local banks. The stock exchange only prospered after the Second World War with the "Interest Equalization Tax" adopted by the United States in 1963. This tax aimed to discourage international debt issuers accessing the US market, where interest rates were limited by the Federal Reserve. As a result, international bond issuers turned to Europe and the euro-dollar bond market started to grow, especially in Luxembourg. During this period the volume of bonds issued in New York strongly decreased as US banks organised in international syndicates to issue bonds outside the US. The regulatory constraints that characterised the largest financial centres in Europe, such as London and Zurich, led US banks to favour Luxembourg as their centre of quotation and issuance.

The abolition of the interest equalization tax in 1974 did not have the anticipated negative impact on Luxembourg's financial centre, as the issuance of euro-dollar bonds continued to increase steadily.

In 1969 Luxembourg saw the first international bond issued in a currency other than the dollar. The year 1981 saw the first listing of a bond denominated in ECU. The Luxembourg stock exchange continued to grow, attracting prestigious bond issuers such as the World Bank in 1988 (USD 1.5 bn). Though the development of the Luxembourg stock exchange was remarkable, it remained small in terms of shares' capi-

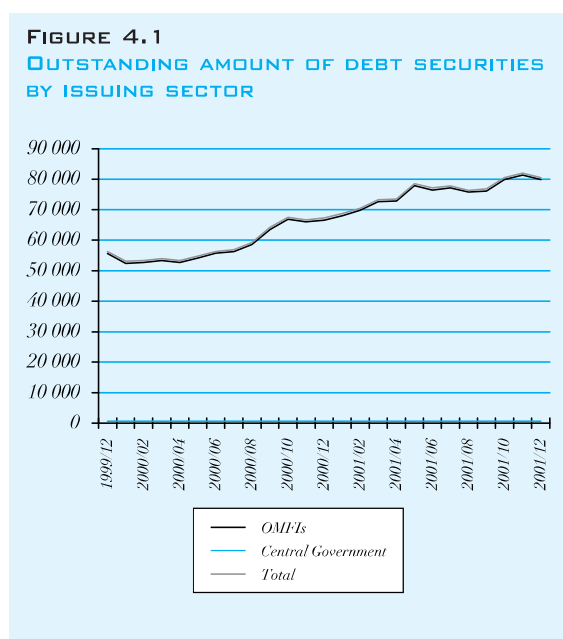
talisation and trade volume, when compared to other European stock markets. At the end of 1998, the Luxembourg stock exchange co-founded the Benelux Stock Exchange alliance and in 2000 it began to cooperate with Euronext.

2.2.4.1 Luxembourg's bond market

During 1998 the total value of the gross issuances of debt securities amounted to EUR 619,121 million in nominal terms. In 1999, it strongly increased to EUR 804,284 million. In 2000, it reached EUR 979,825 million, and in 2001 the issuance value exceeded EUR 1,325,000 million, mainly reflecting the importance in the financing requirement of non-resident companies as a result of the sharp increase of mergers and acquisitions, particularly in the banking and telecom sector. Moreover, the US dollar remained the favoured currency of the international issuers in Luxembourg during the reference period, accounting for more than 59% of total issuance in 2001, while the euro issuance accounted for 34%. The issuance of other currencies was limited to only 6%.

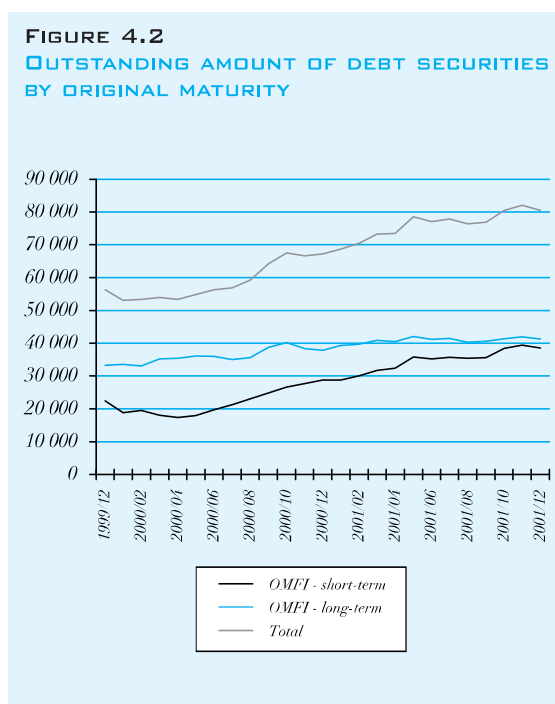
The issuances by residents of debt securities account for only 7%. So, the non-residents account by far for the largest proportion of primary issues. In addition, a new type of credit institution, specialised in the issuance of "mortgage bonds" was launched in 1997 and starts to become more active in the Luxembourg primary market. In 2000, issues of "mortgage bonds" reached the value of EUR 6,117 million. In 2001, 25 new issuances of mortgage bonds, emitted in 4 currencies (EUR, CHF, JPY and USD), were quoted on the Luxembourg stock exchange increasing the total nominal value of mortgage bonds issued by Luxembourg banks to a total of EUR 9,161 million.

Figures 4.1 and 4.2 illustrate the outstanding amount of debt securities issued by residents' OMFIS²¹ on the Luxembourg bond market both by issuing sector and by original maturities.



Source: BCL

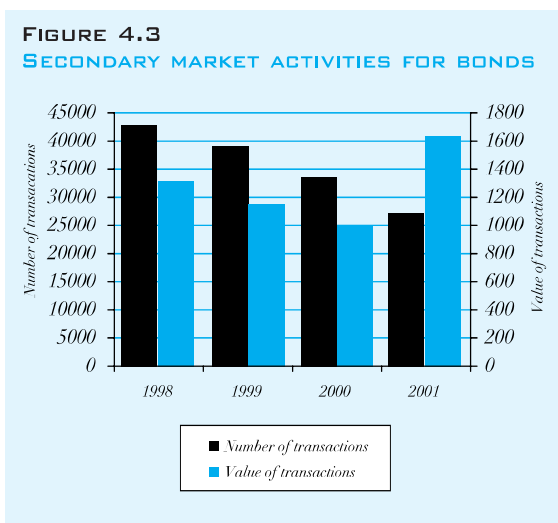
Despite the attractiveness of the Luxembourg bond market for international issuers, the absence of government bond issues and hence the absence of government benchmark bonds, as well as market makers, are noteworthy structural elements. At the end of 2000, the share of central government bonds in the total stock of bond represents only 0.80%. This percentage has remained more or less steady since the beginning of the 90s.



Source: BCL

The secondary market activity for debt securities in Luxembourg, although growing, remains rather illiquid. The annual average of the value of transactions in the bond market amounted to more than EUR 1,000 million during the period under study. The corresponding average number of transactions was 38,475. The secondary bonds market experienced a continuous decline in the number of trades during the reference period, between 1998 and 2001. Figure 4.3, which indicates the downturn in bonds activity, particularly in 2001, when the number of trades reached only 63% of the one observed in 1998.

21 OMFIs refers to MFIs sector excluding the central Bank.

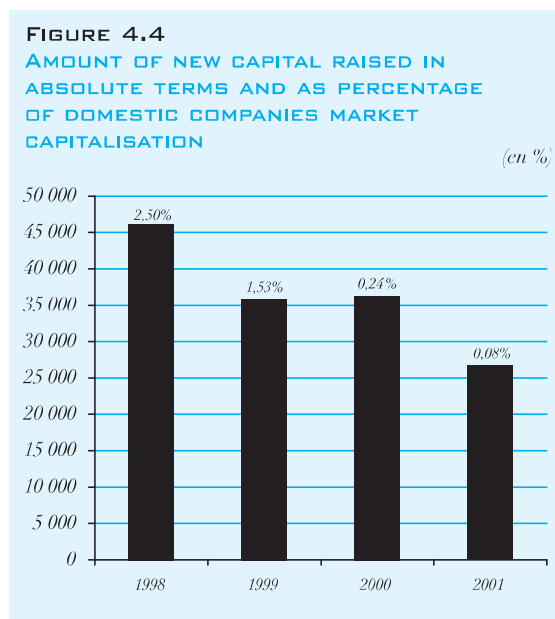


Source: Bourse de Luxembourg

2.2.4.2 The stock market

The primary market

The level of equity issuance in Luxembourg in recent years still remained low both by historical standards as well as by comparison with other developed markets. While in 1998 new issuance accounted for 2.5% of domestic companies' capitalisation, this fell to nearly 1.5% in 1999 and less than 0.25% in 2000 and in 2001. These ratios remained low compared to the euro area standards, which reached 4% in 1999 and 5% in 2001.



Source: Bourse de Luxembourg, calculations by BCL

Table 4.2.1 summarises some structural characteristics of the stock market in 1998 and 2001. In 1998, 276 companies were listed, but at the end of 2001 this number fell to 257 companies. This reduction involved mostly foreign owned companies, which underwent mergers.

Table 11 *Stock market structural characteristics*

Description	1998	2000	2001
Number of listed companies	276	270	257
Number of foreign companies listed	223	216	209
Number of domestic companies listed	53	54	48
Market capitalisation, Euro Million	445,711	559,217	446,046
Domestic companies' capitalisation, Euro Million	46,121	36,231	26,711
Gross amount of capital raised	"-"	1,924	8,058
Number of stocks belonging to Eurostoxx 50	0	0	0
Number of stocks belonging to Eurostoxx 600*	0	0	1 (RTL)
Sectoral distribution of listed companies	"-"	"-"	2 (RTL+SES)
Concentration top 10 companies share of total market capitalisation	74.50%	82.70%	81.59%

Source: Bourse de Luxembourg; *: Bloomberg; "-" = not available.

Table 11 also presents some information on market capitalisation. This can be used to measure the importance of the national equity market, as the ratio of market capitalisation to GDP (reflecting changes in share prices as well as new share offerings). Market capitalisation represented 2,678% of nominal GDP in 1998 and around 2,732% in 2000 after reaching a record level of 2,960% in 1999. In 2001, the market capitalisation to GDP ratio fell to 2001%. The European monetary union, the strong number of foreign listed companies and the leap in new technology shares in 1999 contributed to these developments. In fact, the ratio of market capitalisation to GDP falls strongly if we exclude the foreign listed companies. As a matter of fact, the ratio of the market capitalisation of domestic companies to GDP amounted to 191% in 1998, 195% in 1999, 177% in 2000 and 126% in 2001. Despite this decline, in comparison to the other European countries, market capitalisation still remains very high. This is due to the quotation of national firms such as ARBED, RTL Group, Société Européenne des satellites, which due to their international activities achieve very high capitalisation.

The drop in this ratio during 2000 coincided with the removal of three important domestic companies from the market. Banque Internationale de Luxembourg was absorbed by Dexia, Banque Générale de Luxembourg was taken over by Fortis Group and Safra Republic Holding was absorbed by HSBC. In addition, the RTL group decided to list 10.3% of its floating capital on the London Stock Exchange rather than in Luxembourg. These events hit the concentration index, which stood at 74% in 1998 but rose to 83% in 2000. The concentration index was about 82% in 2001. This is a high rate compared to other European countries,

but may be explained by the small size of the country, which implies a limited number of listable companies, the large presence of foreign companies, whose parent companies are listed abroad, as well as the relative absence of a domestic investment culture.

In addition, a law on investment incentives to promote the economic development (the so-called "Rau" law), provided a favourable tax treatment for investments in companies based in Luxembourg. The tax incentive introduced by this law led to an increase in the demand for the domestic shares, which further tended to increase the market concentration index. The gradual removal of the fiscal incentive will lead to a re-distribution of savings and hence to a reduction of the concentration index.

The secondary market

In table 12, turnover is measured as the value of stocks traded divided by stock market capitalisation. The turnover ratio is not a direct measure of efficiency, as it does not account for trading costs. Instead, this turnover ratio measures the value of stock transactions relative to the size of the market, and it is frequently used as a measure of market liquidity. In Luxembourg, the evolution of this indicator is remarkable compared to the European average. Turnover increased considerably from 1995 to 1999 (207% in Luxembourg and around 38% in Europe). However, from 1998 to 2001, turnover on the Luxembourg stock market had decreased by 53%. A similar trend was visible in the number of transactions. This change mainly affected domestically traded shares rather than internationally traded securities, which may be explained by two factors: the Rau law and the illiquidity of shares in foreign companies listed on the Luxembourg stock market.

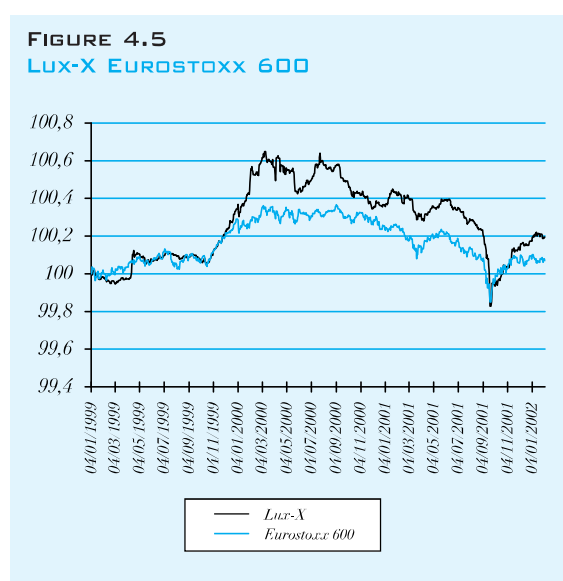
Table 12 *Activity of equity markets*

<i>Description</i>	<i>1998</i>	<i>2000</i>	<i>2001</i>	
Number of stock exchanges and other organised exchanges	1	1	1	
Participants (members) in these markets	68	119	85	
Of which non-domestic (remote) participants	2	37	29	
Number of transactions of traded shares	41,010	43,938	27,046	
Total turnover of traded shares (euro million)	1,059	1,321	494	
	Domestic	1,040	1,309	489
	Foreign	19.7	12.9	5
Access to trading stock listed on exchanges in other countries	1	1	1	

Source: Bourse de Luxembourg

To assess the degree of integration of the Luxembourg stock market in the “European equity market,” the following graph compares the evolution of the Luxembourg index Lux-X²² and the Eurostoxx index.

Both indices were converted to percentage changes (daily changes, relative to January 1999) and two sub-periods were analysed, January 1999 to December 1999, and January 2000 to December 2001. These sub-periods were chosen to reflect the possible structural change in Luxembourg securities market associated with the adoption of the euro in January 1999 and the Euronext alliance in 2000. The correlation coefficient rose slightly between the two sub-periods, from 0.93 to 0.94. This is in line with the expectation of increasing integration leading to a higher correlation of countries’ stock markets movements.



Source: Bloomberg

As illustrated in figure 4.5, the Lux-X index moved in parallel with the Euro Stoxx 600 index, but typically with greater proportional differences between successive lows and highs. These more extensive relative fluctuations are probably due to the higher risk rating

attributed to the international equity funds market, which is of particular importance to the Lux-X index. Adopting a long-term perspective, the Lux-X index surged more strongly than the Euro Stoxx 600, as can be seen between the Lux-X lows in March 1999 and in the mid of 2001.

2.2.5 Financing

The financial structure of a country can be assessed by using two indicators²³, namely the ratio of total assets of intermediaries to domestic stock market capitalisation and the ratio of the value of the credit granted to the private sector by intermediaries to the value of trades of domestic equities on the domestic market. Both ratios will be larger when banks are actively engaged in financing economic activities.

Table 13 *Bank credit vs. trading and banks vs. capitalisation*

	1998	1999	2000	2001
Banks vs. capitalisation	1.13	1.04	1.12	1.61
Bank credit vs. trading	94.44	119.88	99.94	202.1

Source: Bourse de Luxembourg and BCL

However, these two indicators must be interpreted carefully because the Luxembourg shares market is very small compared to other EU countries. While the relative size measure may provide useful information comparing the relative size of intermediaries to stock markets, it has obvious limitations. A relatively large value of banking assets to stock market capitalisation does not necessarily indicate a well-developed banking system. Similarly, a relatively low ratio of bank assets to stock market capitalisation does not necessarily indicate a well-developed equity market. Nevertheless, the ratios calculated above for Luxembourg indicate that banks are actively engaged in channelling credit to the private sector relative to the value of trading on domestic stock market.

²² The Lux-X index is a basket index with a twofold computation, i.e. the Price LuxX index and the return LuxX index. The price index has been published since 4 January 1999. The return index is similar to the price index except that it takes into account the stripped net dividends. The return index has been published since 31 March 1999.

²³ Dermiguc-Kunt, A. and R. Levine (1996), *op. cit.*

2.2.5.1 Corporations (non-financial corporations)

Unfortunately, only partial stock data on financing is available for the Luxembourg corporate sector. This makes it impossible to determine the most important lenders to non-financial corporations.

Table 14 *Financing of the corporate sector (Average flows: NA, stocks for 2001)*

As percentage of GDP

<i>External financing</i>	<i>Average flow 1998-2000</i>	<i>Stocks 2001</i>
Shares and other equity	3.2	"_"
Securities other than shares (with maturity split)	"_"	"_"
Loans	"_"	"_"
from MFIs (with maturity split)	"_"	24.8
up to 1 year		15.5
over 1 year & up to 2 years		8.3
over 5 years		10.9
- from OFIs	"_"	"_"
- from abroad	"_"	"_"
- from other sources	"_"	"_"
Trade credits and advances	"_"	"_"
Other liabilities and financial derivatives	"_"	"_"
<i>Internal financing</i>		
Gross savings	"_"	"_"
Net savings	"_"	"_"

Source: BCL, MFI statistics, "-" = not available

2.2.5.2 Government

The debt of the Luxembourg public sector is low. It represents only 5.2% of GDP at the end of 2001. Nevertheless, there is a possibility that the gross consolidated debt of the general government will be decreasing below the actual level in the following few years owing to a stabilising budget surplus of the central government.

Table 15 External financing of the public sector (Average flows, stocks)

As percentage of total GDP

<i>External financing</i>	<i>Average flow (1)</i>	<i>Stocks 1998</i>	<i>Stocks 2001</i>
Securities other than shares (with maturity split)	0.09	3.28	2.85
up to 1 year	0.00	0.00	0.00
over 1 year	0.09	3.28	2.85
Loans			
from MFIs* (with maturity split)	0.21	6.00	3.66
o/w Central Government**:	0.01	4.73	1.43
o/w Other General Government:	0.19	4.27	2.23
Maturity split for Other General Government:			
up to 1 year	-0.11	0.24	0.44
over 1 year & up to 5 years	0.01	0.05	0.06
over 5 years	0.29	3.98	1.73
Other liabilities and financial derivatives	0.03	0.04	0.58
<i>Internal financing</i>			
Gross savings	9.12	"_"	"_"
Net savings (2)	4.04	"_"	"_"

Source: : STATEC, IGF, BCL, MFI statistics, "-" = not available .

* from resident MFIs only

** no further breakdown by maturity available

Average gross and net savings are calculated over the period 1997-2000. Other flows are estimated over the period 1998-2000 on the basis of the available stocks. This method disregards potential stock-flow adjustments. However, the latter should be limited in the case of Luxembourg, where the relevant stocks are primarily expressed in domestic currency.

(1) The discrepancy between net savings and the sum of the flows related to "securities", "loans" and "other liabilities" is attributable to sustained increases in the asset position of general government.

2.2.5.3 Households

The domestic banking sector is the most important lender to the domestic household sector. Housing loans accounted for 76% of Luxembourg household's total credit in 2001, while they accounted for 75% in 1998. During the same period, the nominal amount of housing loans increased by 30%. This progression can be attributed in part to the effects of sustained house price rises in Luxembourg.

Table 16 *Financing of households (Average flows NA, stocks for 2000, source MFI statistics)*

As a percentage of total GDP

<i>External financing</i>	<i>Average flow</i>	<i>Stocks 1998</i>	<i>Stocks 2001</i>
Loans	"_"	36.20	38.01
Consumer loans (with maturity breakdown)	"_"	2.90	3.11
up to 1 year		0.30	0.38
over 1 year & up to 5 years		2.30	2.43
over 5 years		0.30	0.30
Housing loans (with maturity breakdown)	"_"	26.60	28.77
up to 1 year		0.40	0.43
over 1 year & up to 5 years		0.50	0.55
over 5 years		25.60	27.79
Other loans	"_"	6.80	6.13
Other liabilities	"_"	"_"	
Gross savings	"_"	"_"	
Net savings	"_"	"_"	

Source: : BCL, MFI statistics, "-" = not available

2.2.6 Conclusion

As indicated in the introduction, our goal was not to rigorously test specific hypotheses. Rather, our objectives have been to compile and compare different indicators of the Luxembourg Financial structure before and after the adoption of the single currency, the euro. Looking at the financial system in different periods, it is possible to detect a pattern. Banks, other financial intermediaries, and the stock market became larger. Banks are still more active and more efficient in Luxembourg than elsewhere in Europe.

The analysis of financial structures across the indicators of size and activity gives a clear pattern. Despite the progress of the Luxembourg stock market efficiency and liquidity, its size remains small. So, in using these indicators, we see that the Luxembourg financial system is a rather bank-based system. This result suggests that the traditional monetary policy transmission through the banking balance sheet still plays a dominant role in Luxembourg. However, the high liquidity degree of Luxembourg banks' assets may tend to neutralise any effects of a tightening monetary policy.