

# Empirics of the Oslo Stock Exchange: Liquidity results.

Bernt Arne Ødegaard\*

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## Contents

<b>1</b>	<b>Introduction</b>	<b>1</b>
<b>2</b>	<b>The evolution of liquidity measures at the OSE over time</b>	<b>1</b>
2.1	Turnover . . . . .	1
2.2	Bid ask spread . . . . .	6
2.3	Relative bid ask spread . . . . .	11
2.4	No trading days . . . . .	16
2.5	Amivest . . . . .	18
2.6	Amihud Illiq . . . . .	21
2.6.1	Amihud Illiq–calculated from daily returns . . . . .	21
2.6.2	Amihud Illiq–calculated from monthly returns . . . . .	25
2.7	Lesmond Ogden Trzcinka . . . . .	29
2.8	Roll . . . . .	32
2.9	Liu . . . . .	36
2.10	Atkins Dyl . . . . .	40
2.11	Amortized spread . . . . .	42
2.12	Pastor Stambaugh . . . . .	46

## 1 Introduction

This report describes measures of liquidity at the Oslo Stock Exchange. The analyses are essentially updates (through 2010) of those done in Næs, Skjeltorp, and Ødegaard (2008), and we refer to that paper for definitions.

## 2 The evolution of liquidity measures at the OSE over time

In this section we provide time series plots of a number of liquidity measures.

### 2.1 Turnover

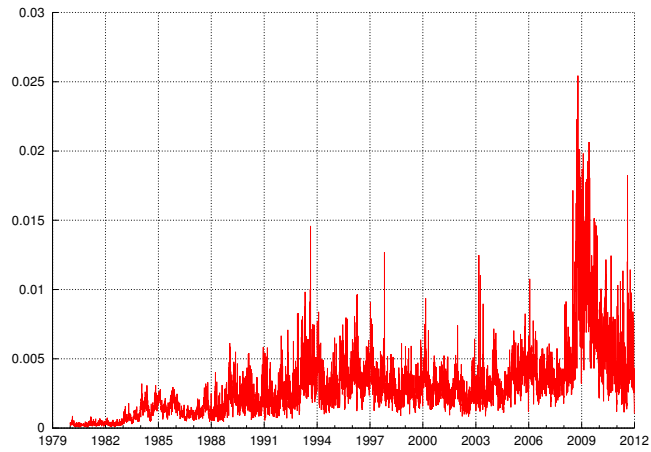
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\*University of Stavanger and Norges Bank. The views expressed are those of the author and should not be interpreted as reflecting those of Norges Bank.

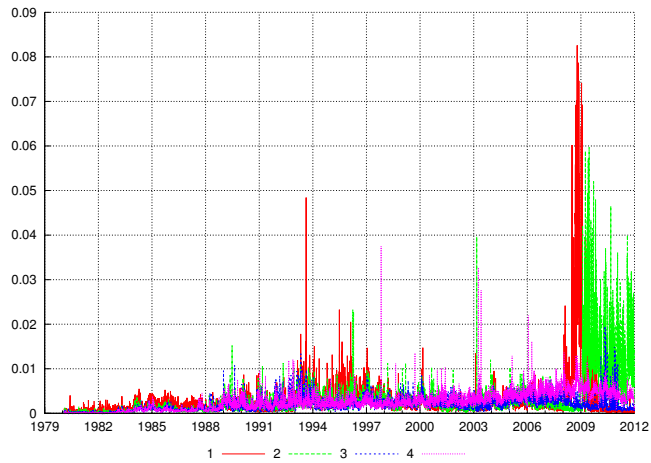
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**Figure 1** Time series evolution of daily Turnover

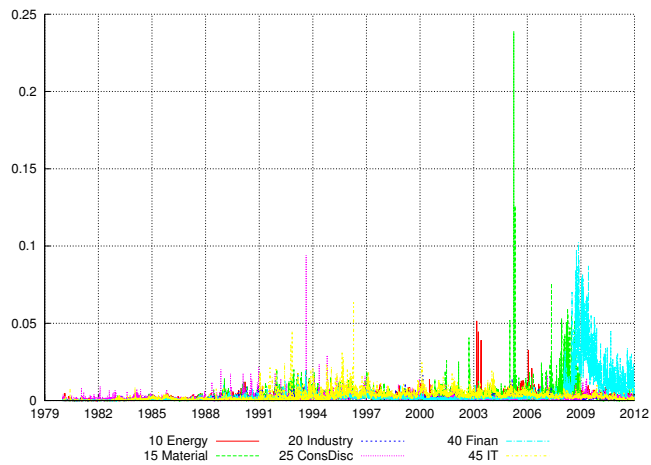
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Grouped by size quartile



Grouped by industry



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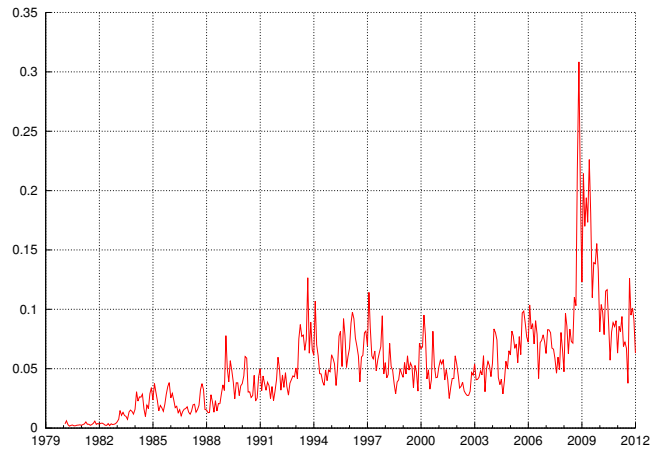
Time series plot of evolution of liquidity measures.

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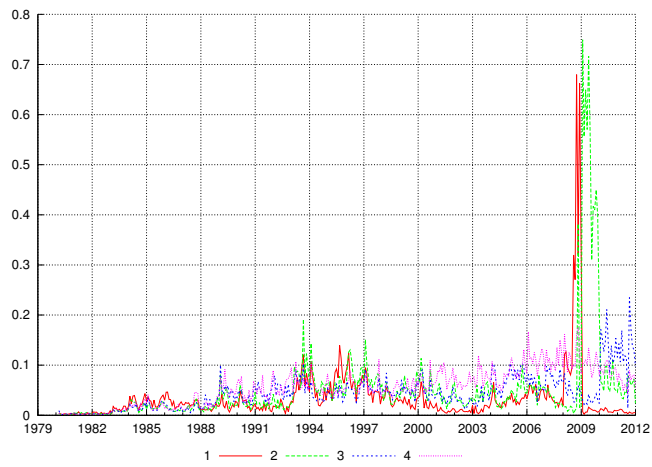
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**Figure 2** Time series evolution of monthly Turnover

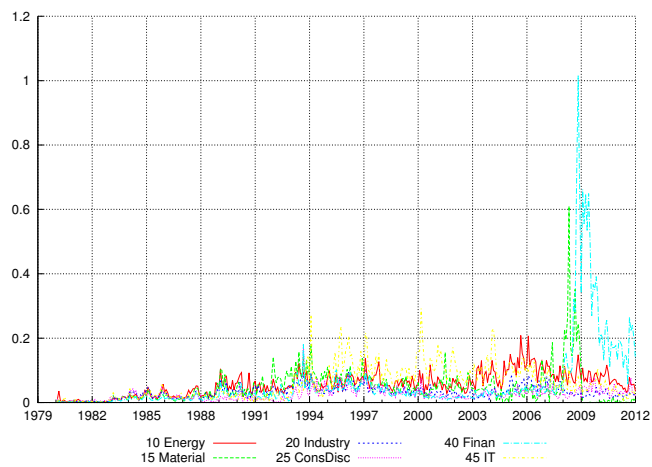
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Grouped by size quartile



Grouped by industry



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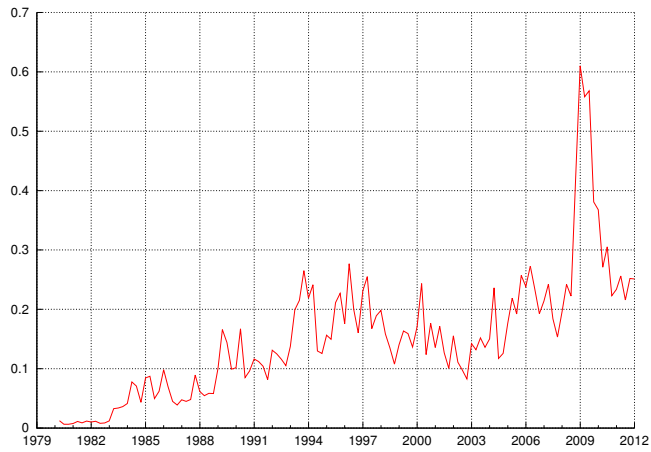
Time series plot of evolution of liquidity measures.

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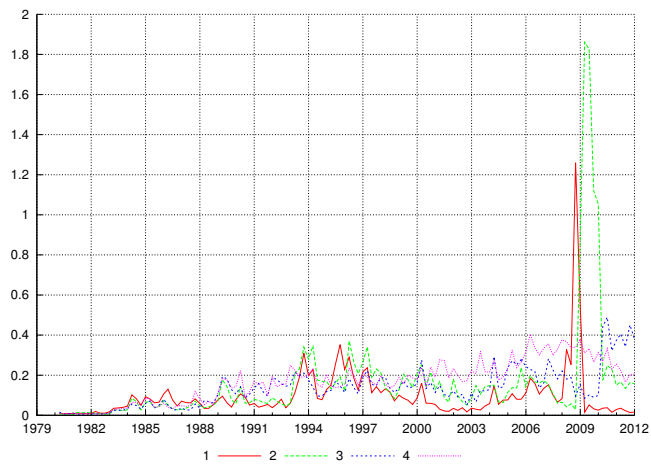
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**Figure 3** Time series evolution of quarterly Turnover

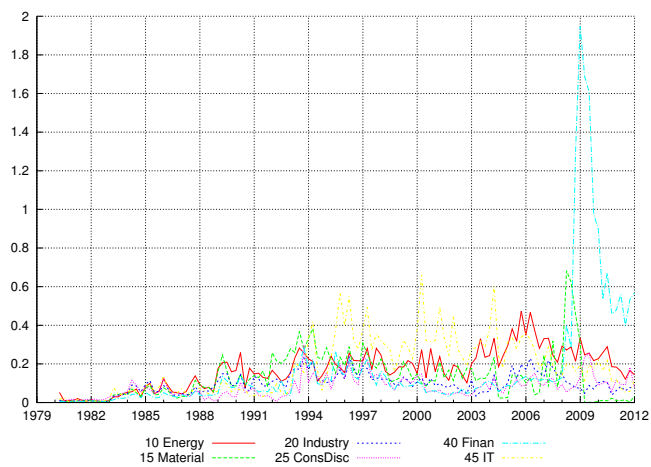
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Grouped by size quartile



Grouped by industry



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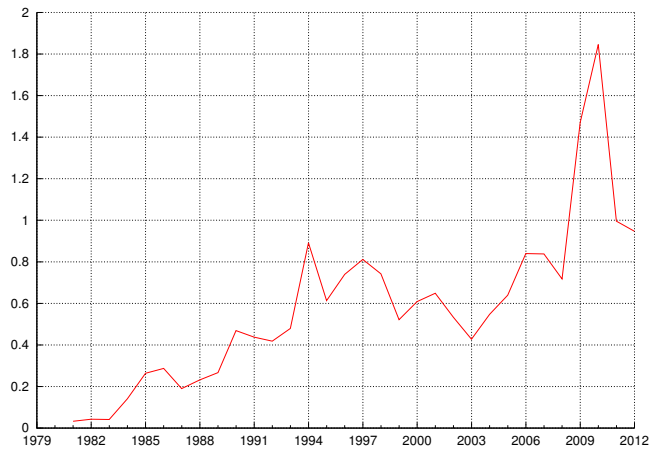
Time series plot of evolution of liquidity measures.

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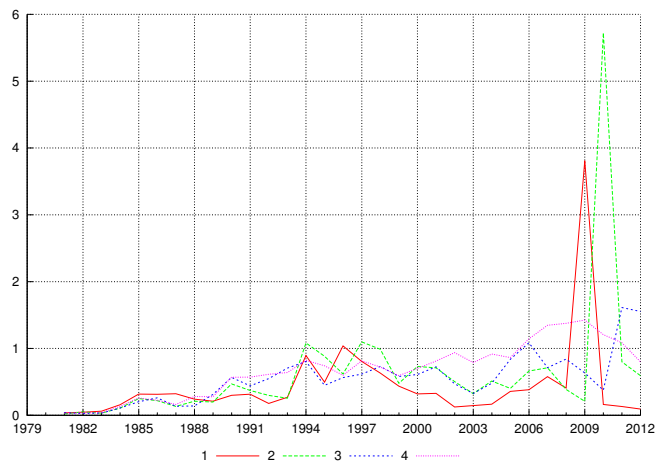
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**Figure 4** Time series evolution of annual Turnover

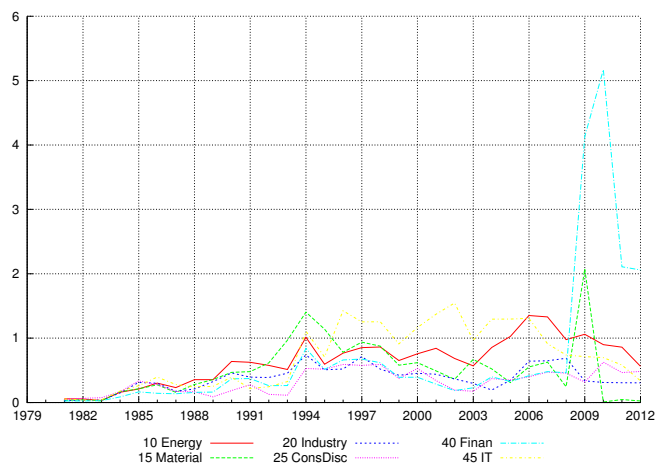
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Grouped by size quartile



Grouped by industry



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Time series plot of evolution of liquidity measures.

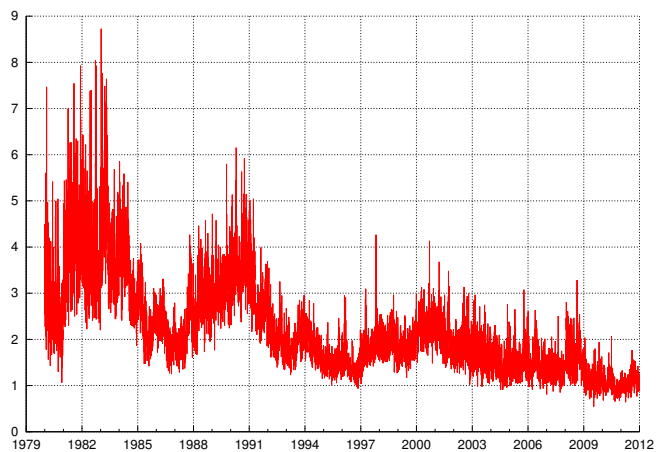
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## 2.2 Bid ask spread

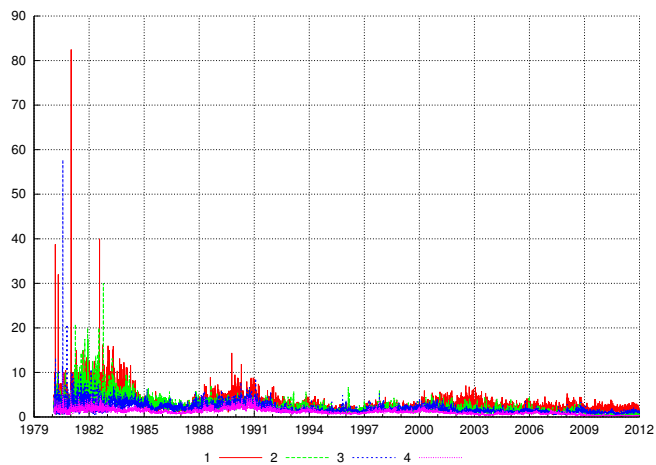
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**Figure 5** Time series evolution of daily Bid/ask spread

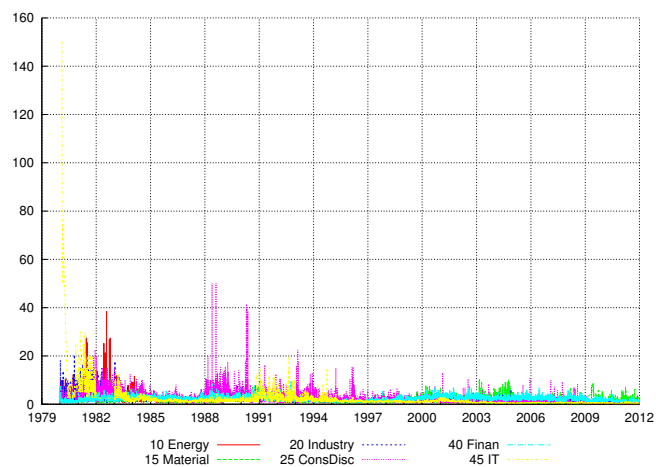
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Grouped by size quartile



Grouped by industry



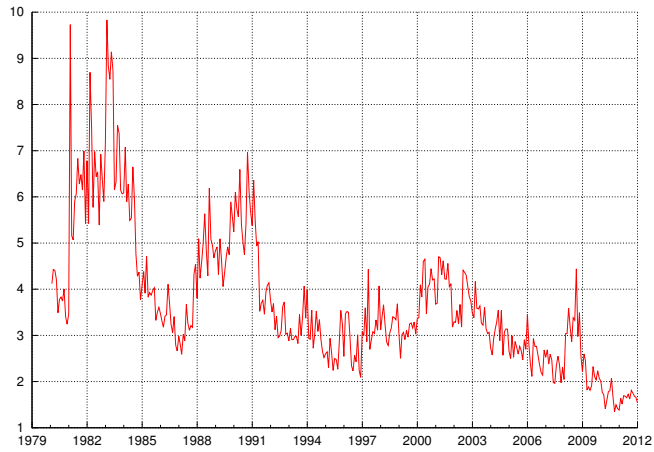
Time series plot of evolution of liquidity measures.

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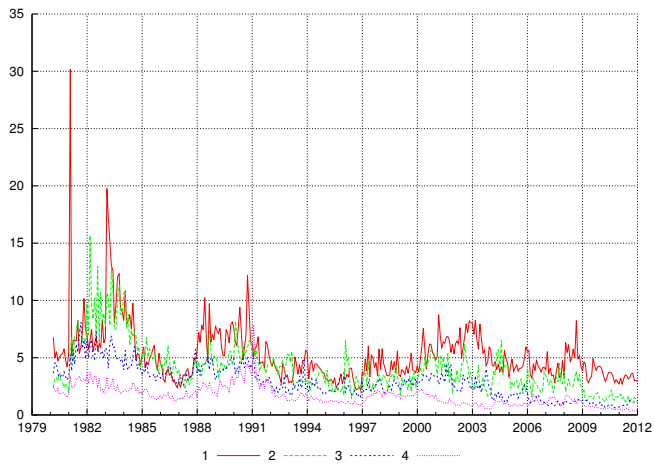
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**Figure 6** Time series evolution of monthly average Bid/ask spread

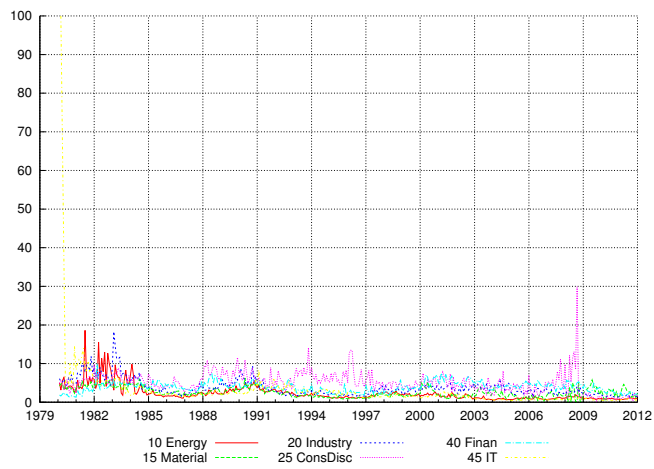
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Grouped by size quartile



Grouped by industry



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Time series plot of evolution of liquidity measures.

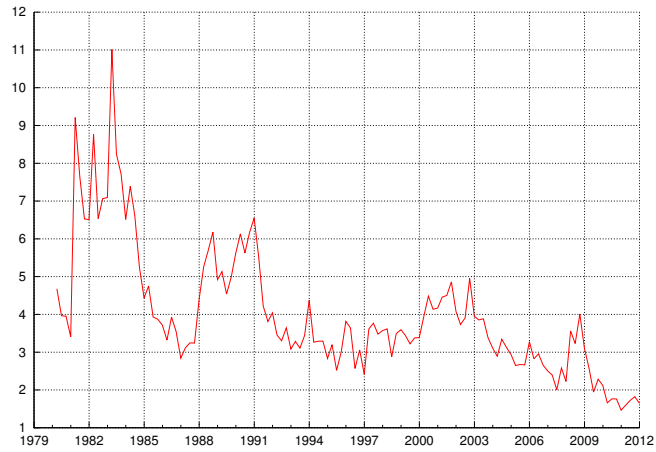
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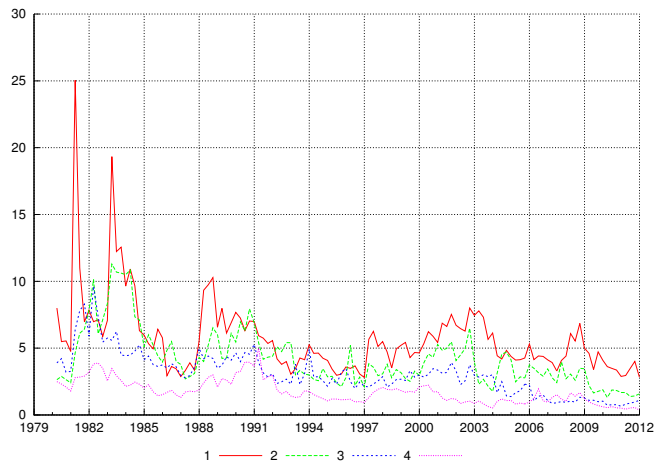
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**Figure 7** Time series evolution of quarterly average Bid/ask spread

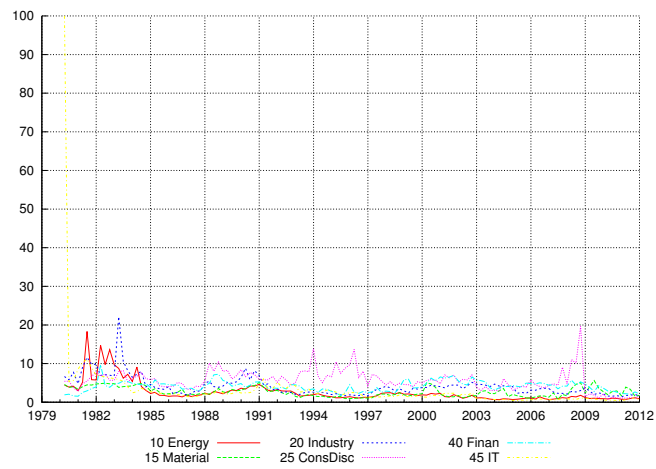
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Grouped by size quartile



Grouped by industry



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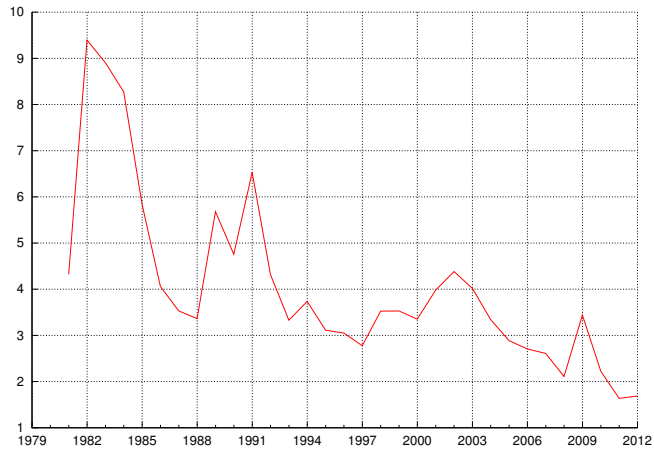
Time series plot of evolution of liquidity measures.

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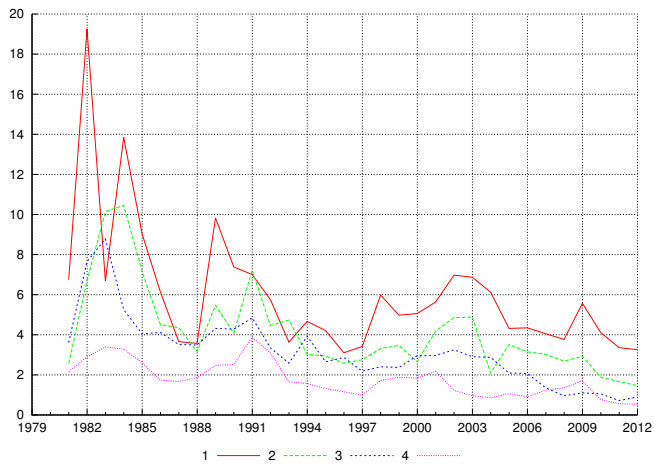
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**Figure 8** Time series evolution of annual average Bid/ask spread

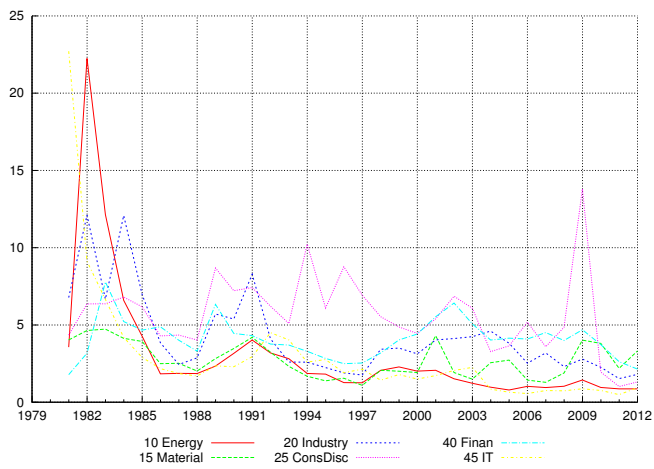
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Grouped by size quartile



Grouped by industry



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Time series plot of evolution of liquidity measures.

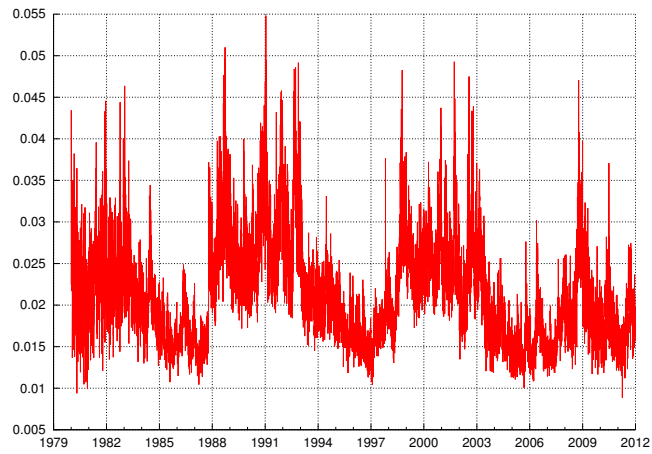
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## 2.3 Relative bid ask spread

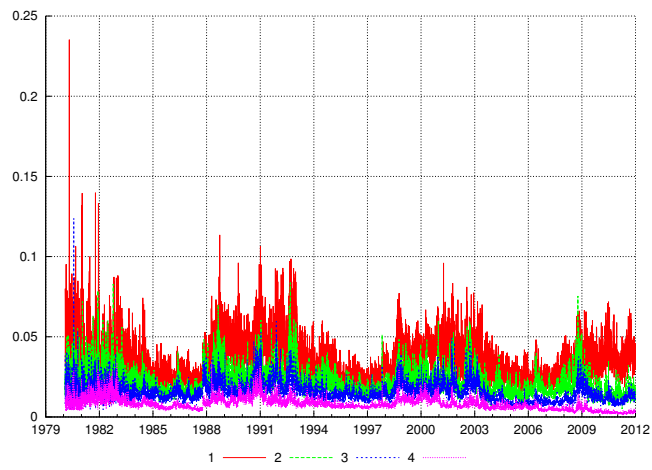
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**Figure 9** Time series evolution of daily Relative bid/ask Spread

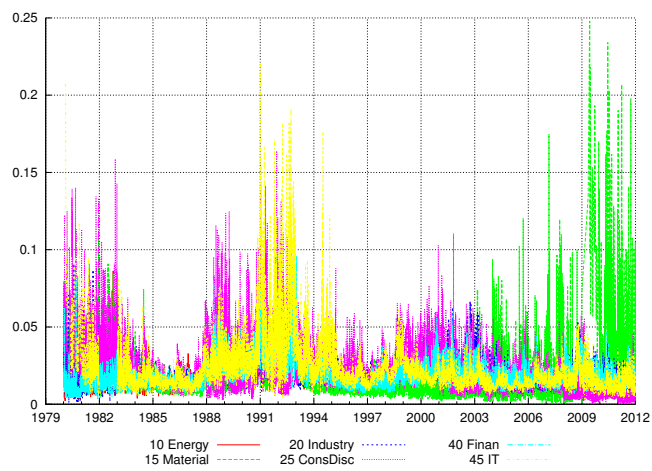
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Grouped by size quartile



Grouped by industry



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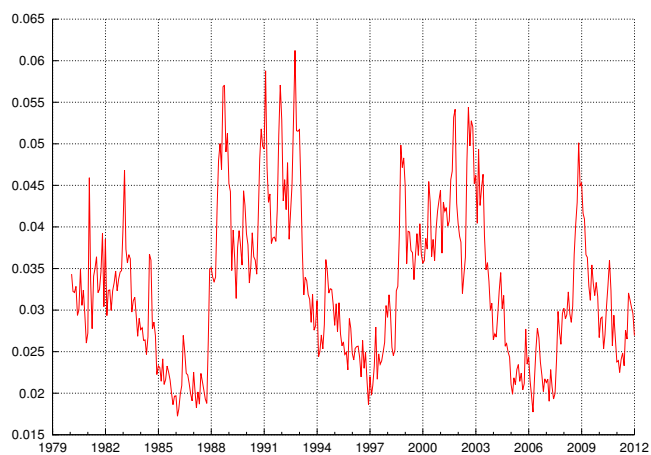
Time series plot of evolution of liquidity measures.

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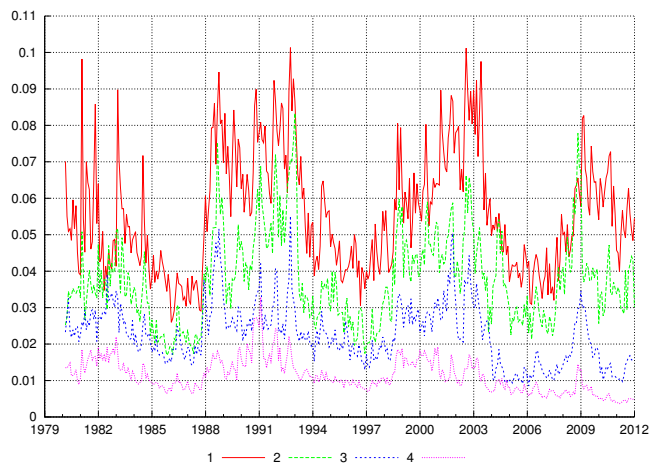
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**Figure 10** Time series evolution of monthly average Relative bid/ask Spread

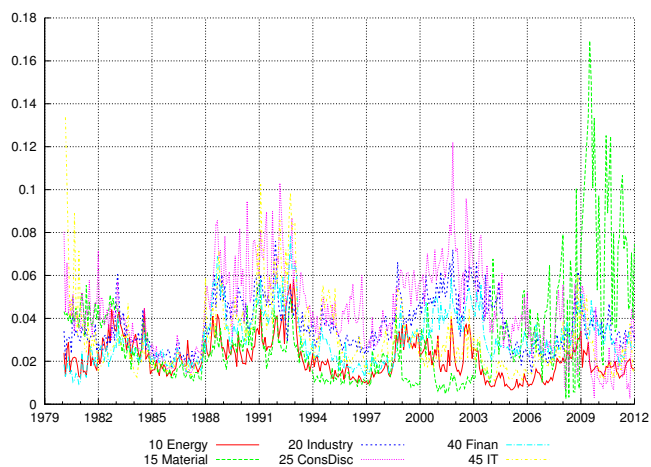
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Grouped by size quartile



Grouped by industry

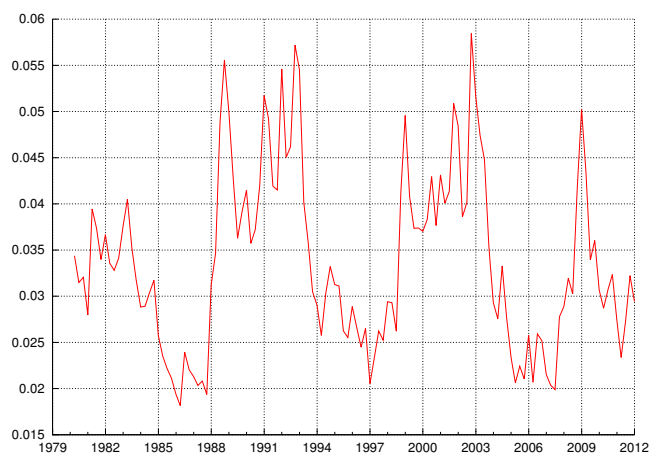


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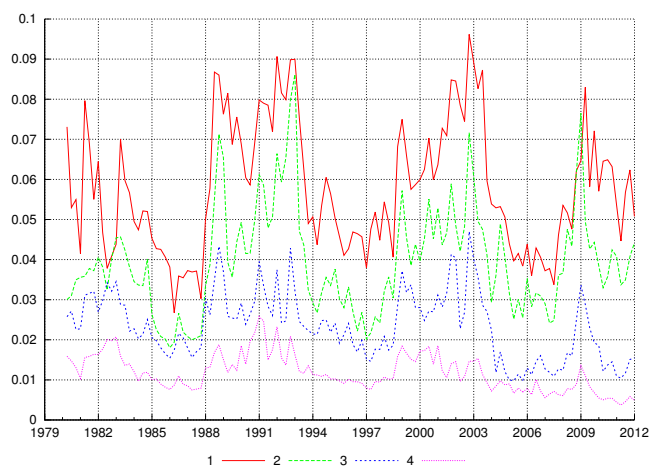
Time series plot of evolution of liquidity measures.

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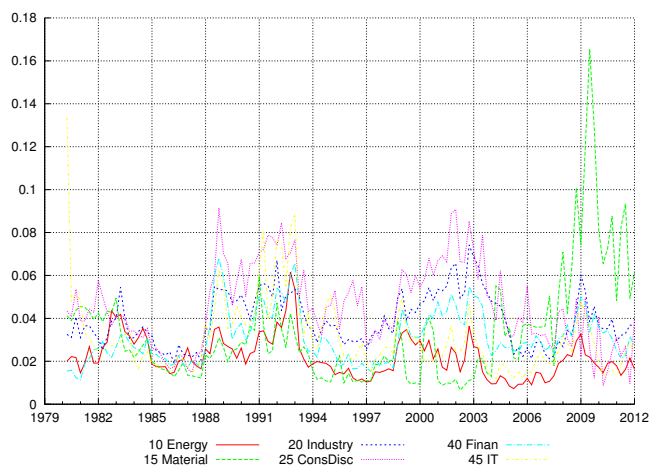
**Figure 11** Time series evolution of quarterly average Relative bid/ask Spread



Grouped by size quartile



Grouped by industry

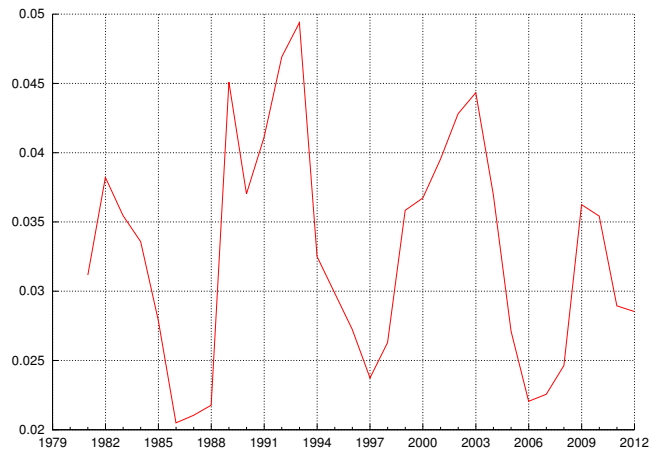


Time series plot of evolution of liquidity measures.

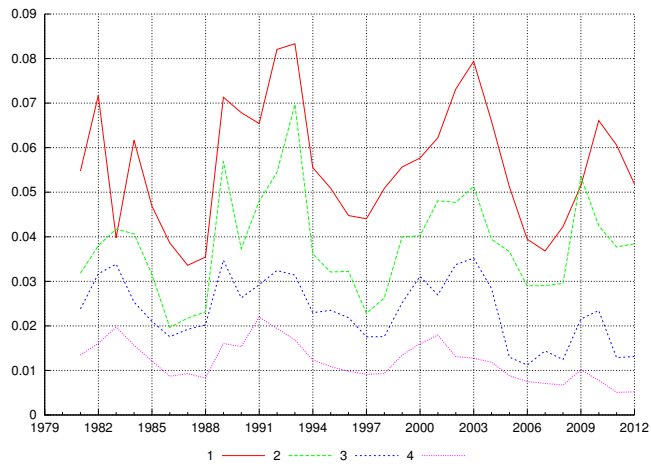
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**Figure 12** Time series evolution of annual average Relative bid/ask Spread

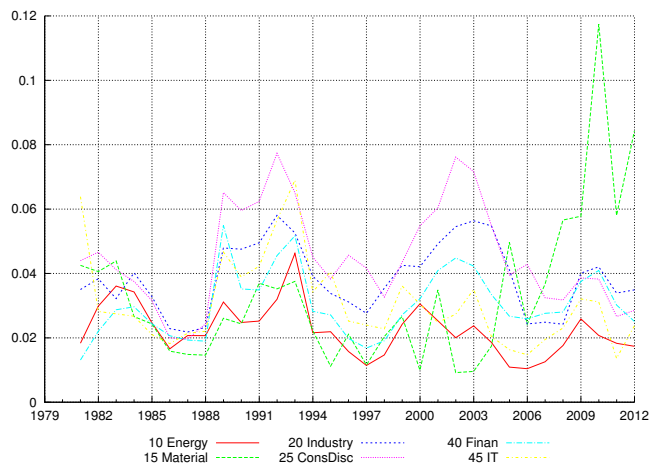
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Grouped by size quartile



Grouped by industry



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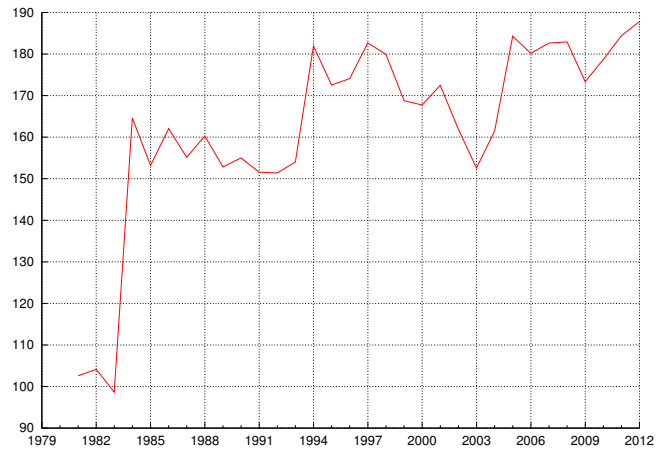
Time series plot of evolution of liquidity measures.

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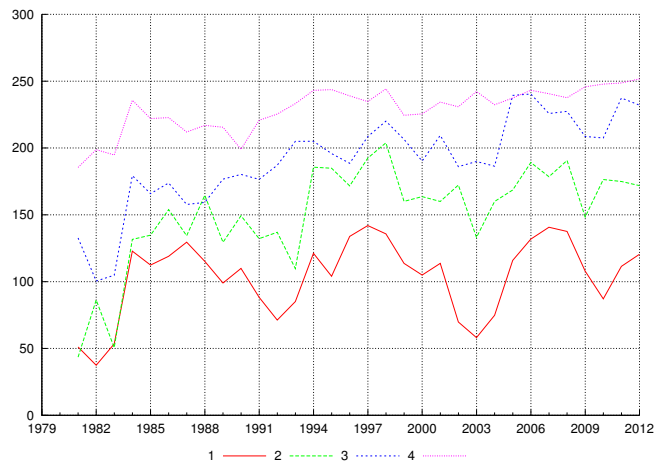
## 2.4 No trading days



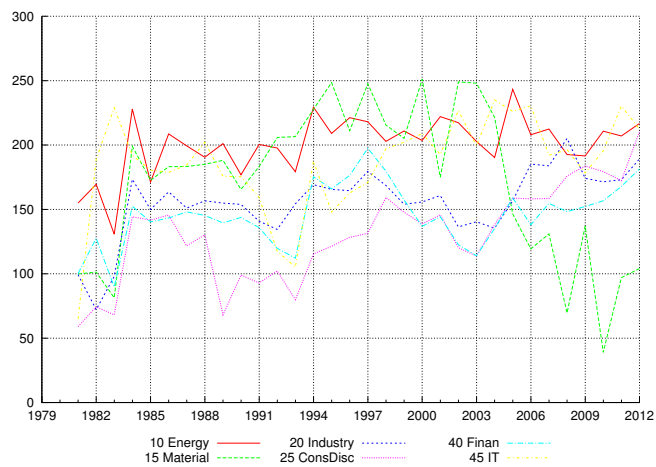
**Figure 13** Time series evolution of annual No trading days in year



Grouped by size quartile



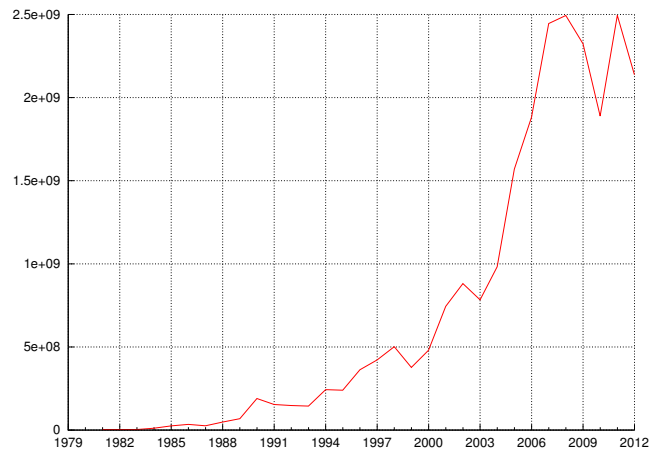
Grouped by industry



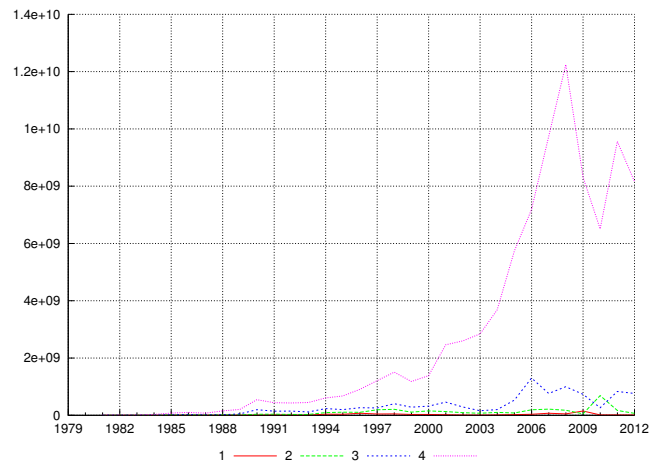
Time series plot of evolution of liquidity measures.

## 2.5 Amivest

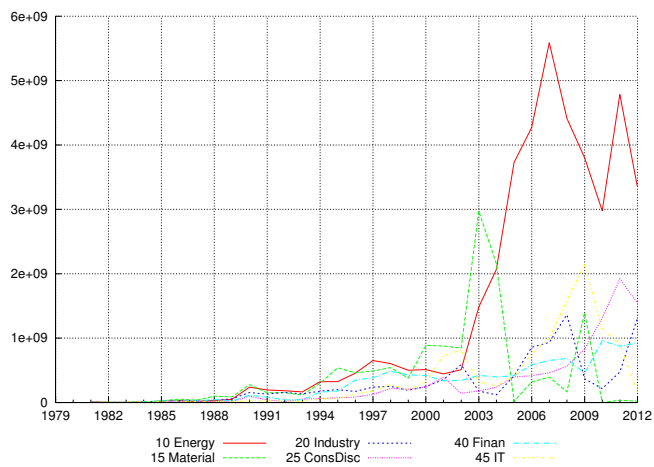
**Figure 14** Time series evolution of annual Amivest



Grouped by size quartile

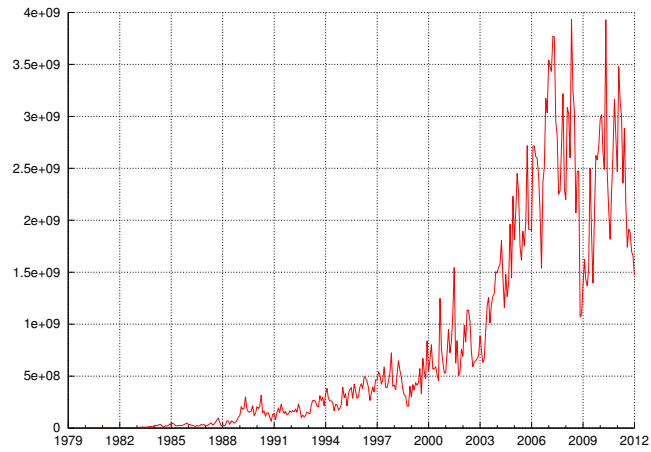


Grouped by industry

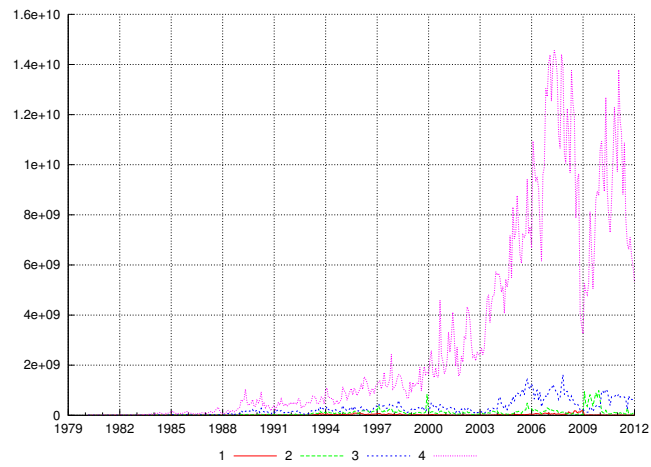


Time series plot of evolution of liquidity measures.

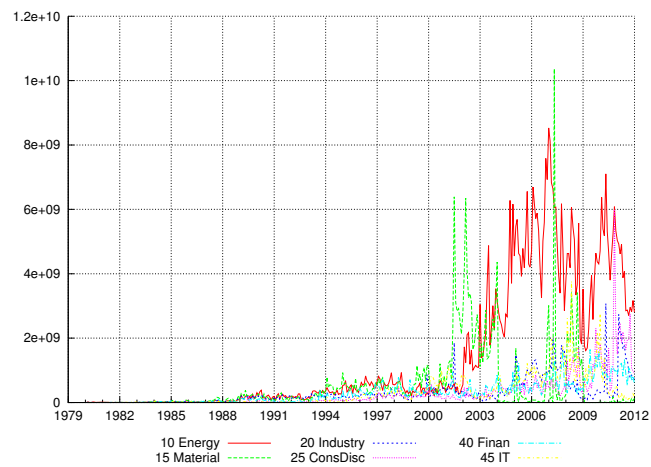
**Figure 15** Time series evolution of monthly Amivest



Grouped by size quartile



Grouped by industry

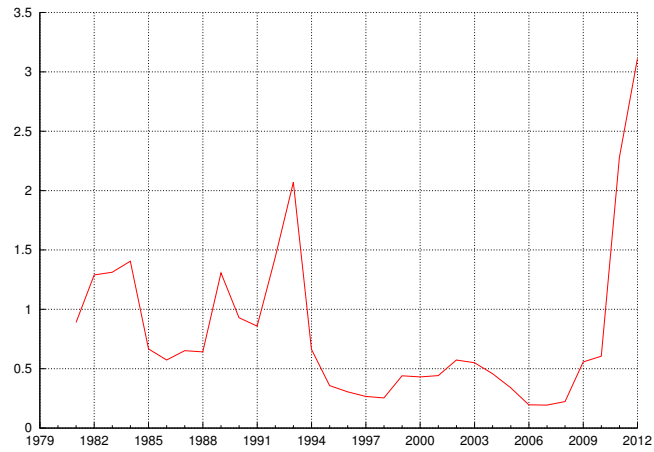


Time series plot of evolution of liquidity measures.

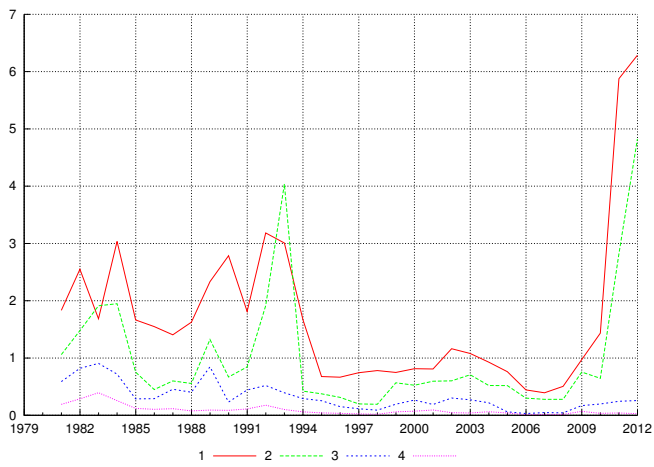
## 2.6 Amihud Illiq

### 2.6.1 Amihud Illiq—calculated from daily returns

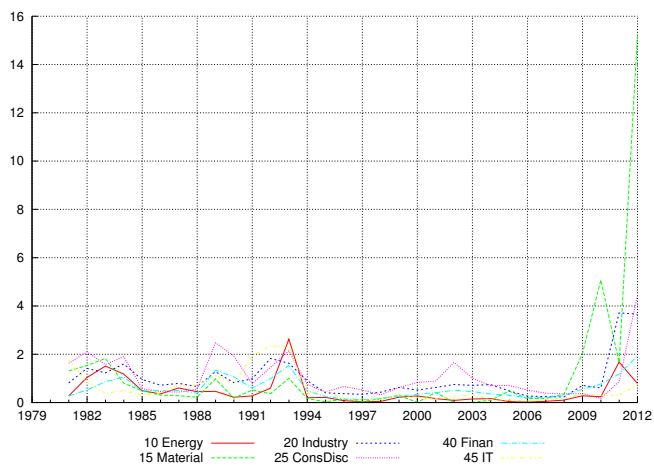
**Figure 16** Time series evolution of annual Amihuds ILLIQ



Grouped by size quartile

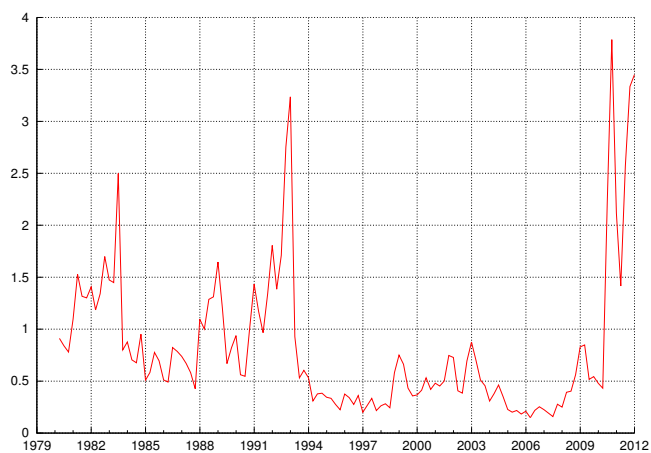


Grouped by industry

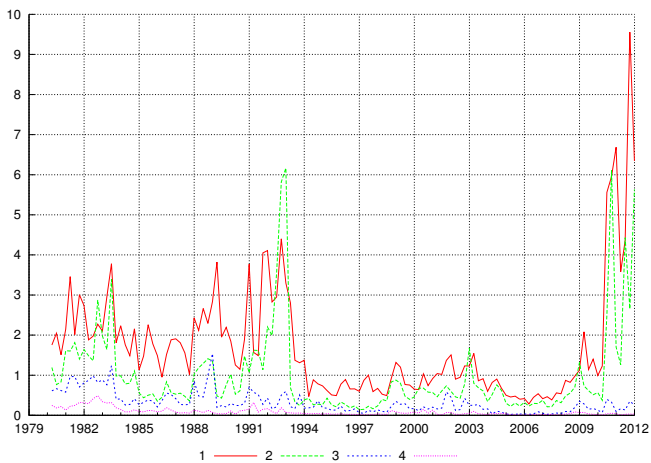


Time series plot of evolution of liquidity measures.

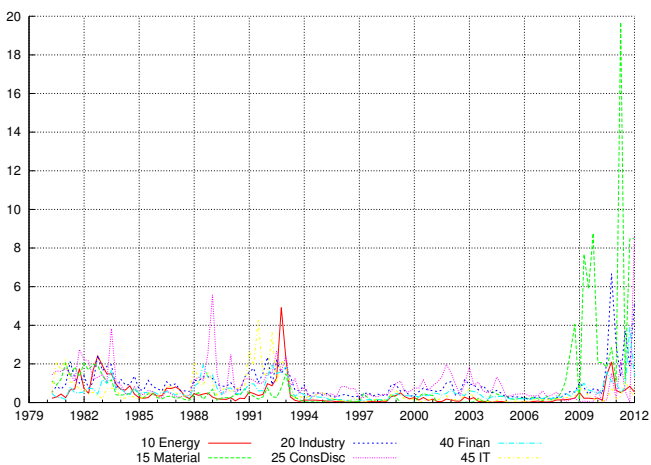
**Figure 17** Time series evolution of quarterly Amihuds ILLIQ



Grouped by size quartile

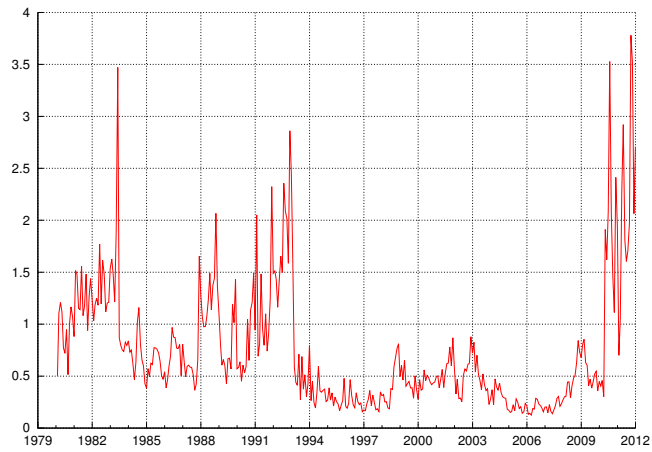


Grouped by industry

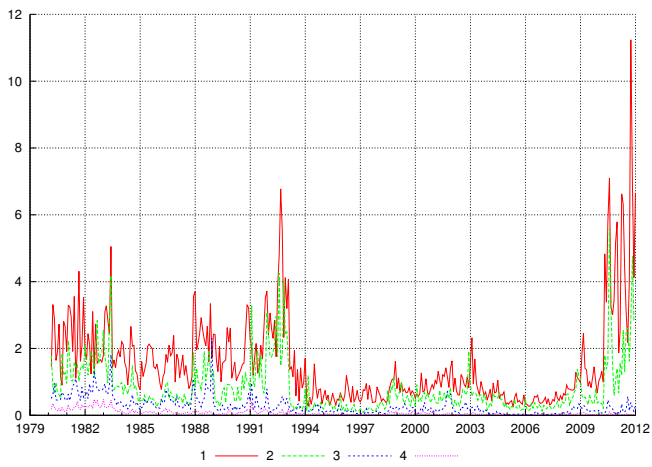


Time series plot of evolution of liquidity measures.

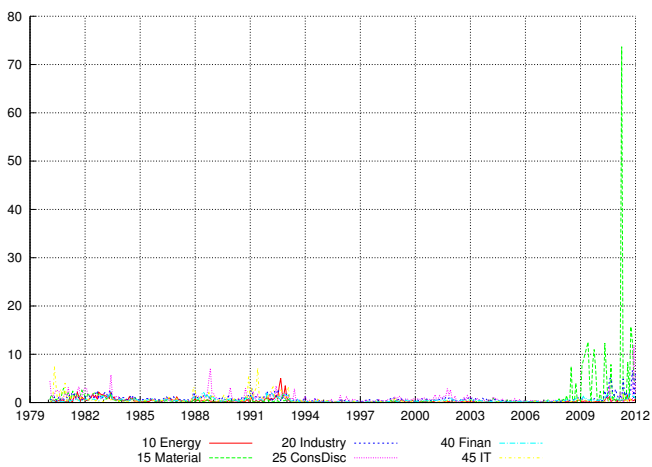
**Figure 18** Time series evolution of monthly Amihuds ILLIQ



Grouped by size quartile



Grouped by industry

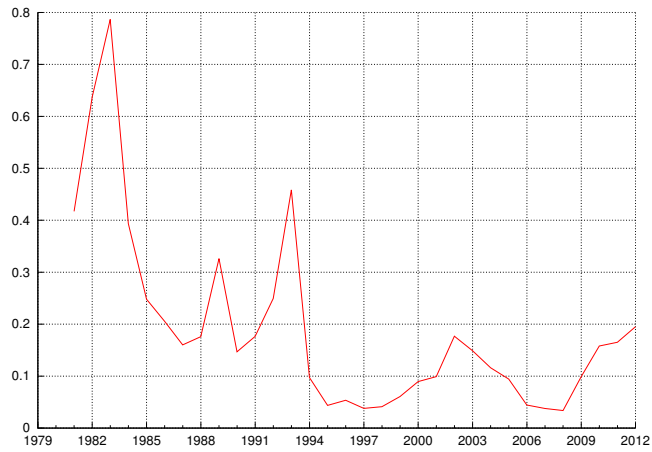


Time series plot of evolution of liquidity measures.

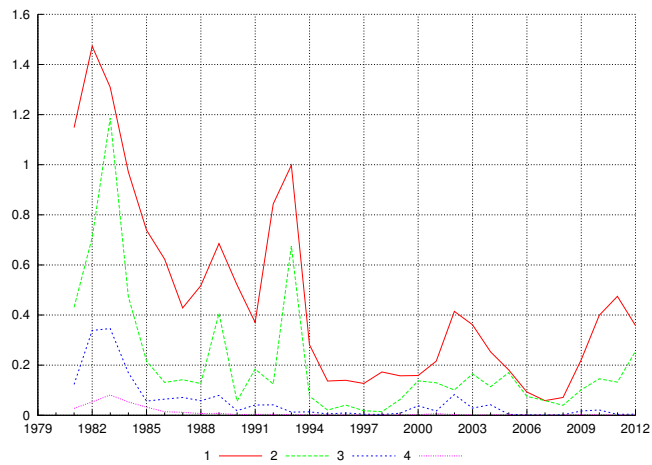


## 2.6.2 Amihud Illiq—calculated from monthly returns

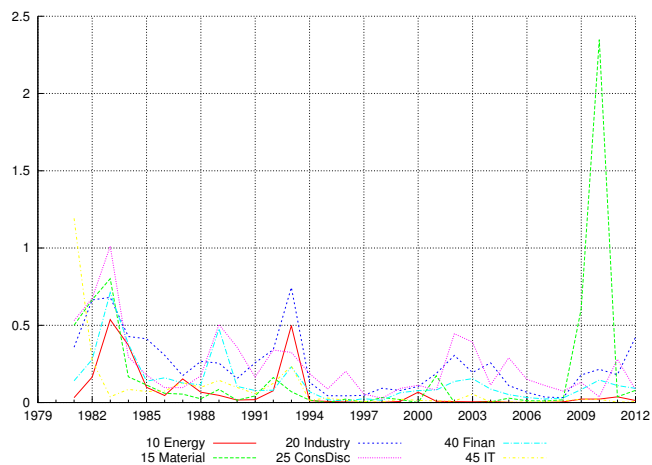
**Figure 19** Time series evolution of annual Amihuds ILLIQ



Grouped by size quartile

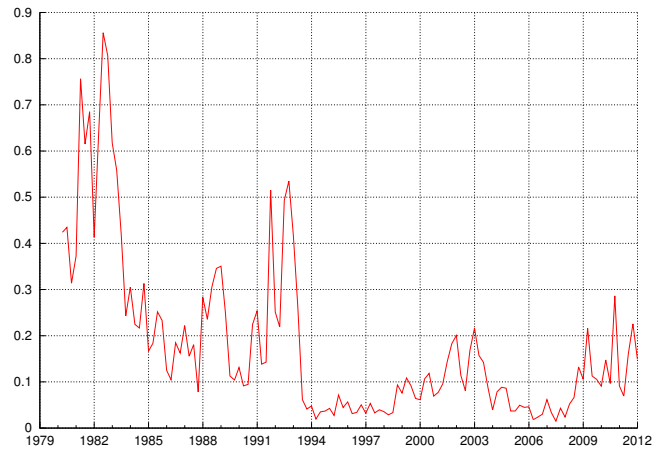


Grouped by industry

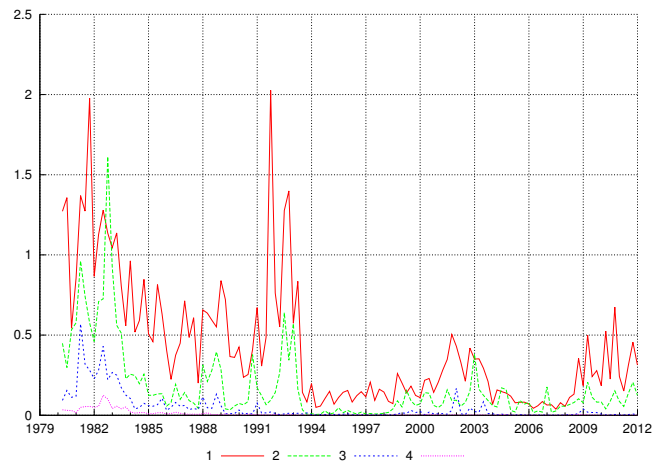


Time series plot of evolution of liquidity measures.

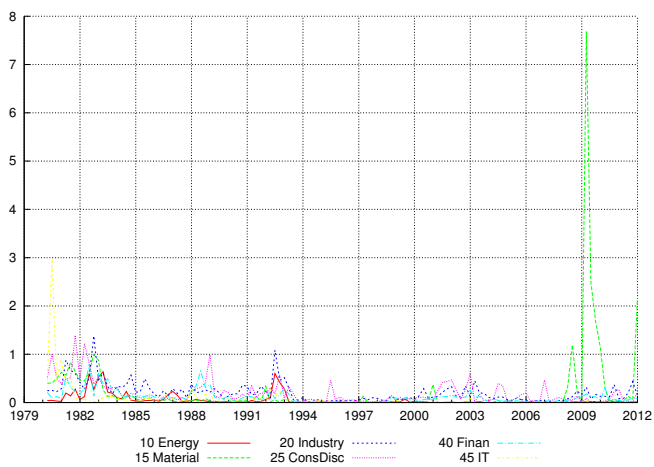
**Figure 20** Time series evolution of quarterly Amihuds ILLIQ



Grouped by size quartile



Grouped by industry

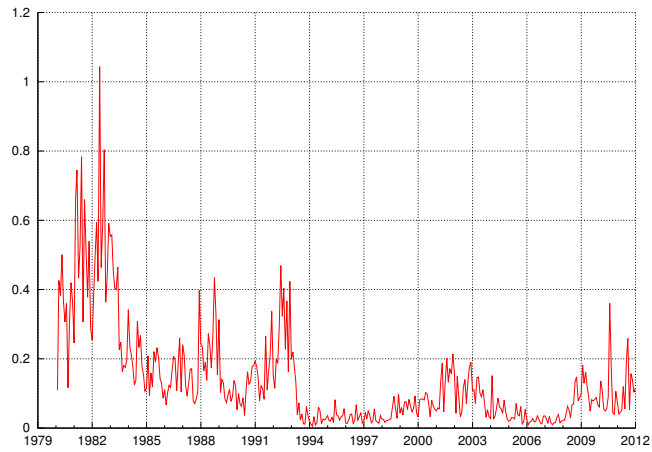


Time series plot of evolution of liquidity measures.

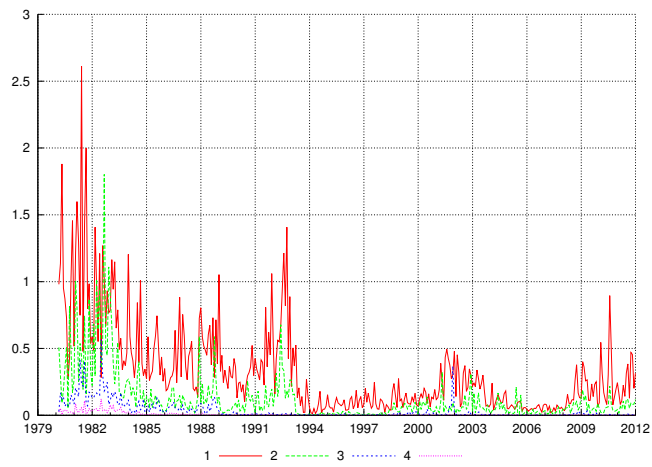
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**Figure 21** Time series evolution of monthly Amihuds ILLIQ

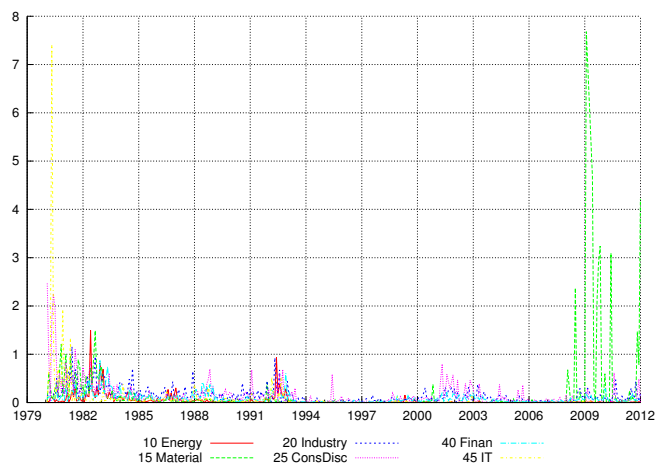
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Grouped by size quartile



Grouped by industry



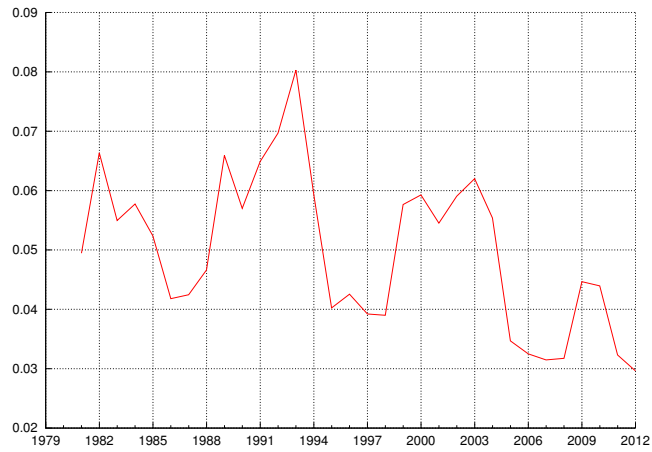
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Time series plot of evolution of liquidity measures.

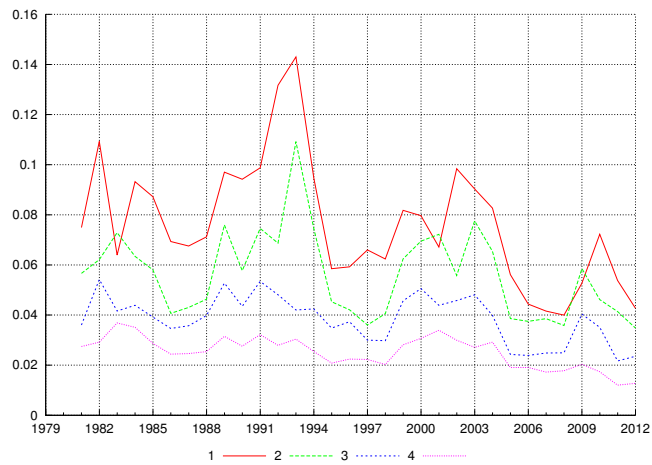
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## 2.7 Lesmond Ogden Trzcinka

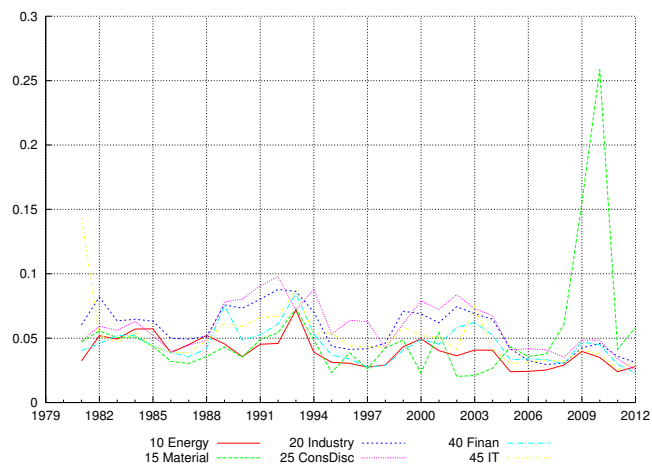
**Figure 22** Time series evolution of annual LOT



Grouped by size quartile

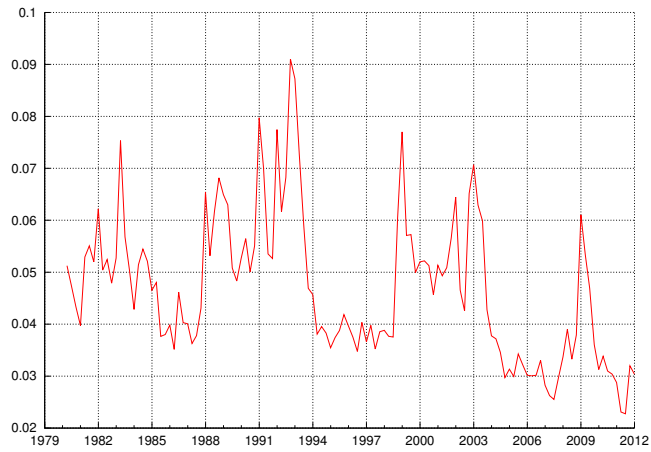


Grouped by industry

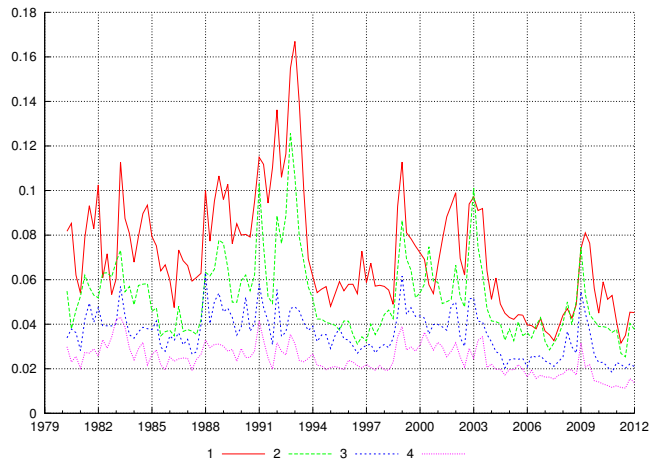


Time series plot of evolution of liquidity measures.

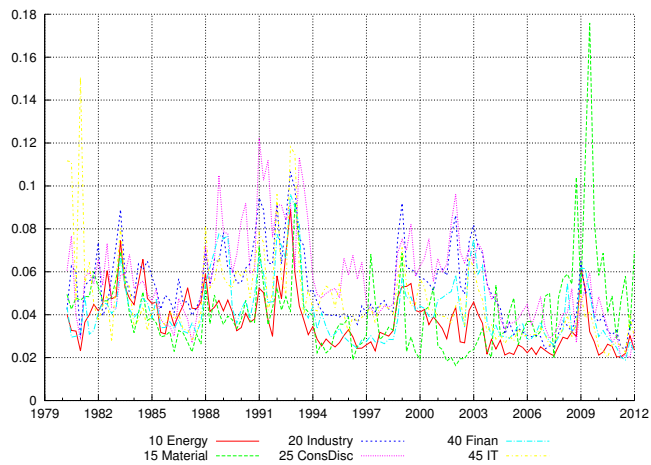
**Figure 23** Time series evolution of quarterly LOT



Grouped by size quartile



Grouped by industry

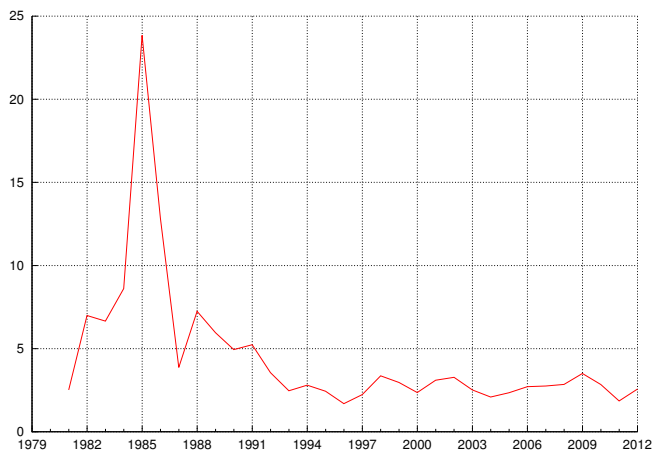


Time series plot of evolution of liquidity measures.

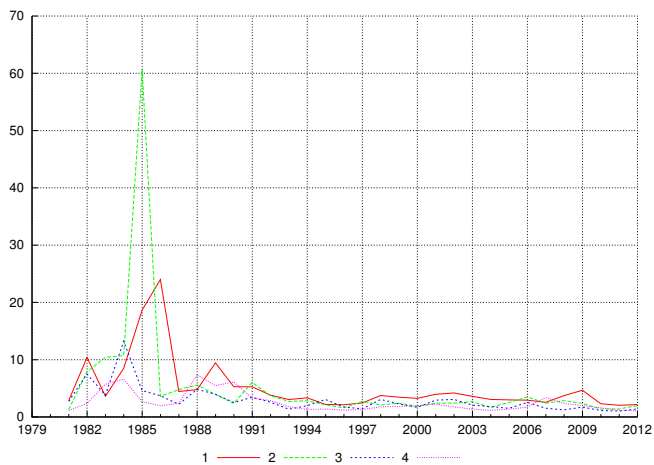
## 2.8 Roll



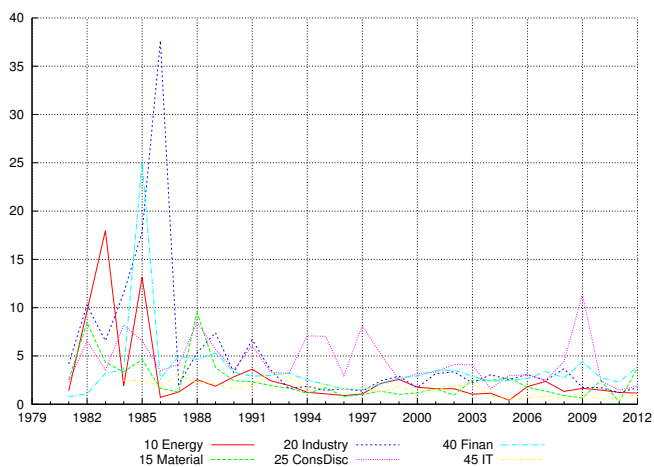
**Figure 24** Time series evolution of annual Roll measure (prices)



Grouped by size quartile

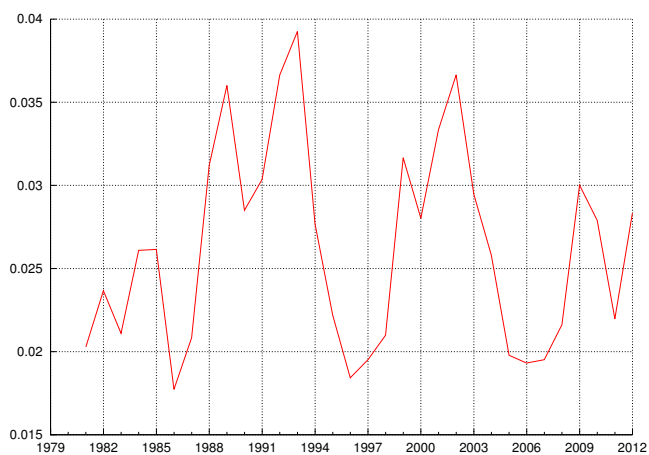


Grouped by industry

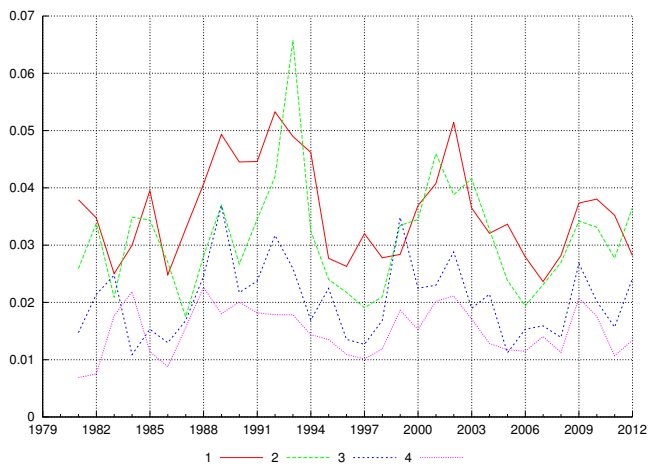


Time series plot of evolution of liquidity measures.

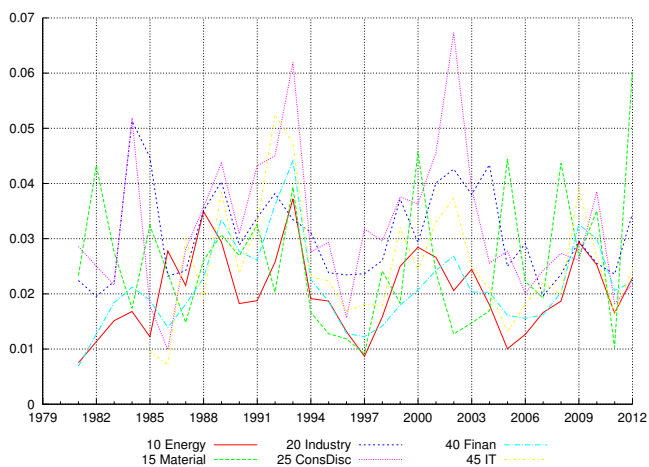
**Figure 25** Time series evolution of annual Roll measure (returns)



Grouped by size quartile

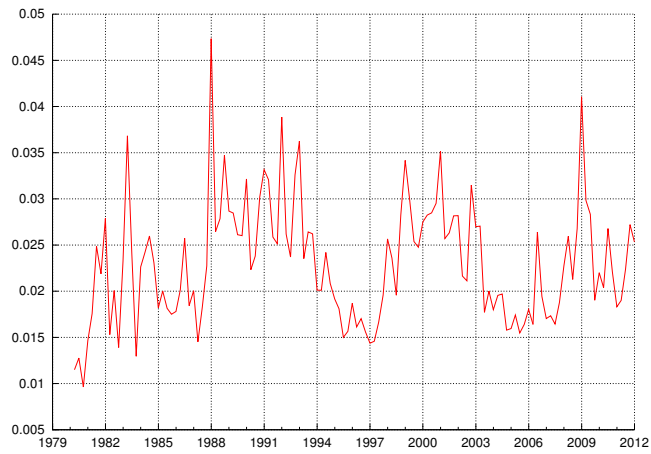


Grouped by industry

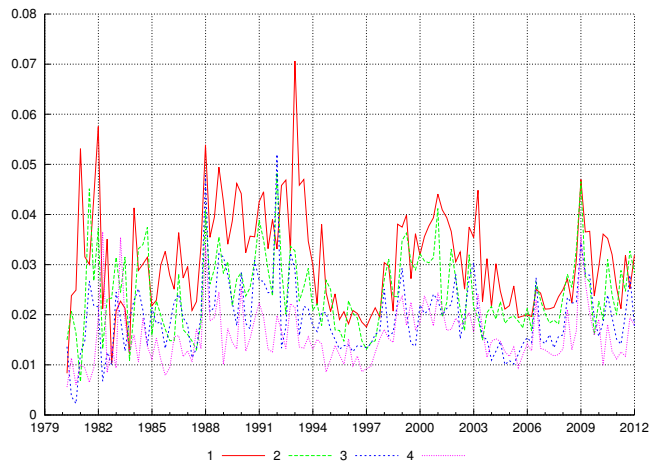


Time series plot of evolution of liquidity measures.

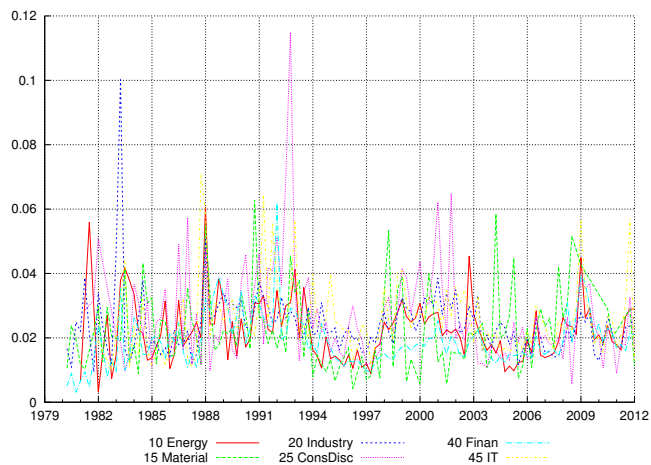
**Figure 26** Time series evolution of quarterly Roll measure (returns)



Grouped by size quartile



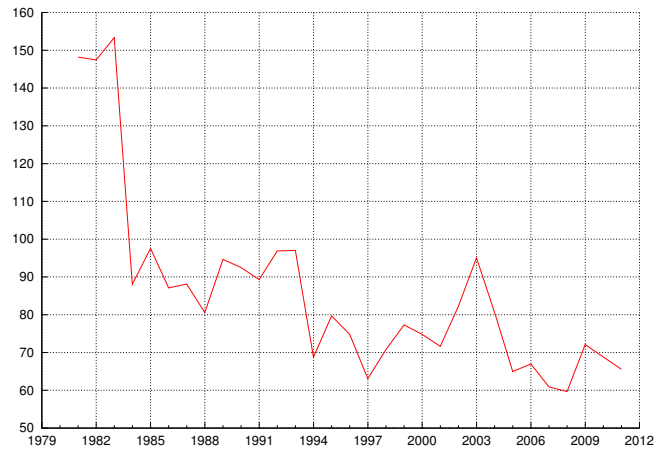
Grouped by industry



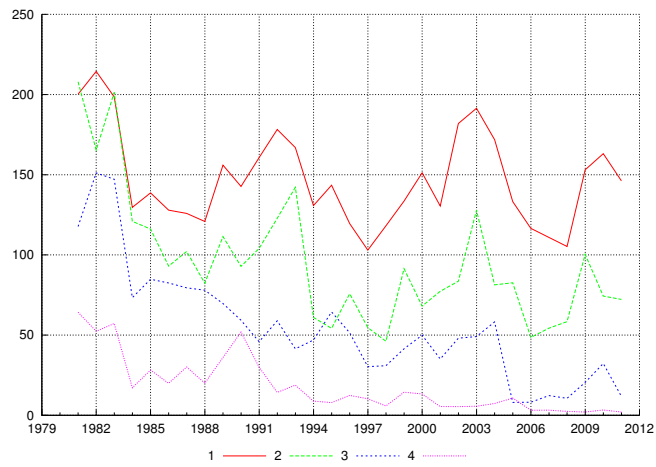
Time series plot of evolution of liquidity measures.

## 2.9 Liu

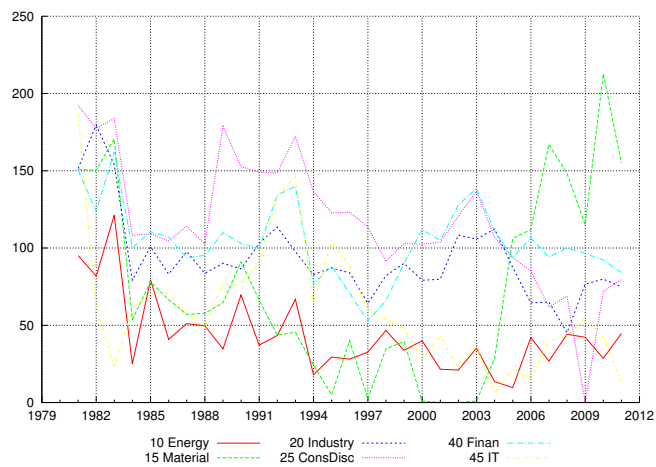
**Figure 27** Time series evolution of annual Liu Liquidity measure LMx



Grouped by size quartile

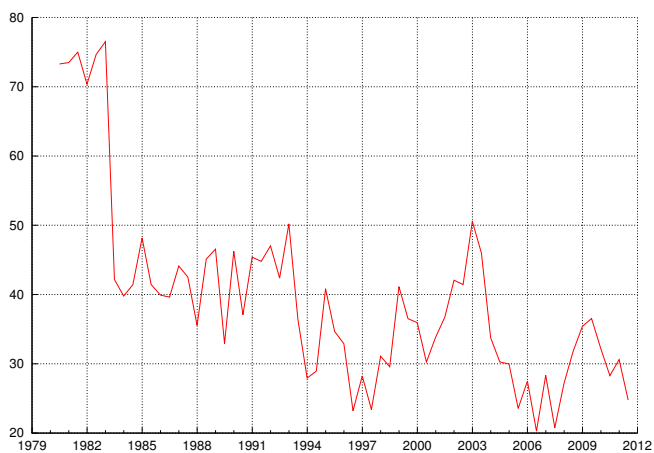


Grouped by industry

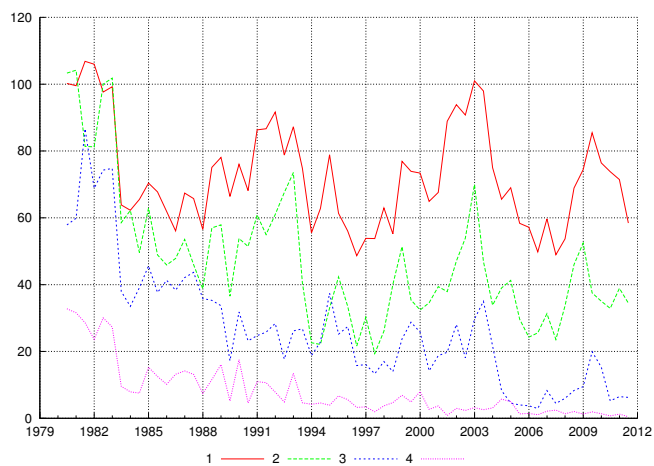


Time series plot of evolution of liquidity measures.

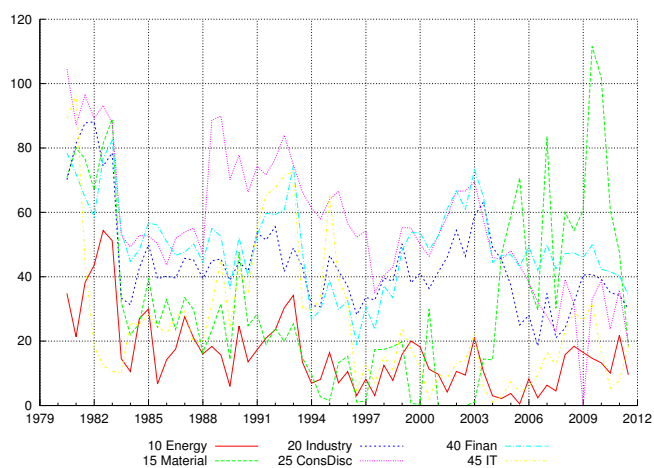
**Figure 28** Time series evolution of biannual Liu Liquidity measure LMx



Grouped by size quartile

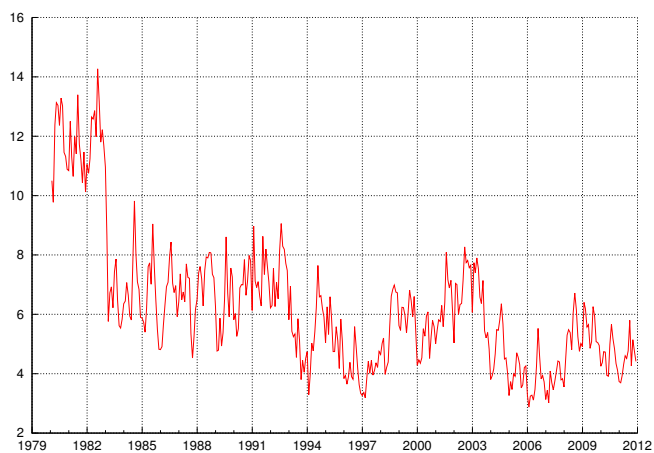


Grouped by industry

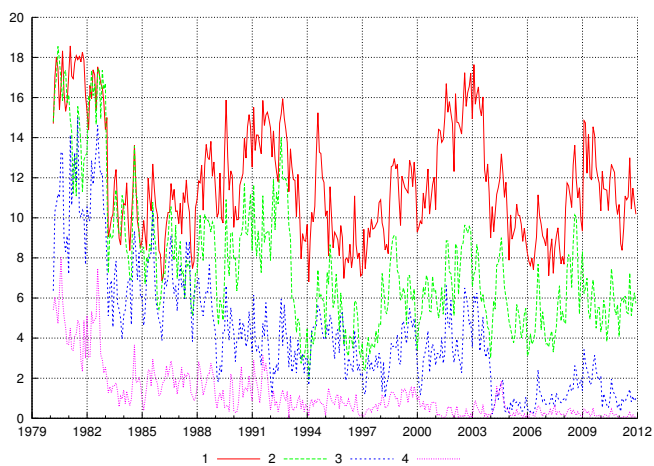


Time series plot of evolution of liquidity measures.

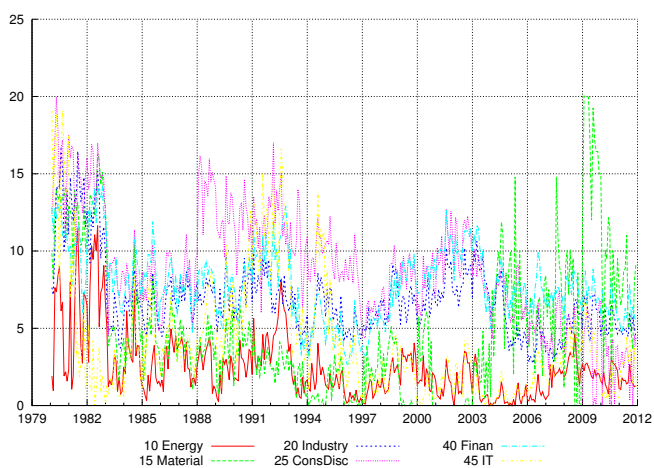
**Figure 29** Time series evolution of monthly Liu Liquidity measure LMx



Grouped by size quartile



Grouped by industry



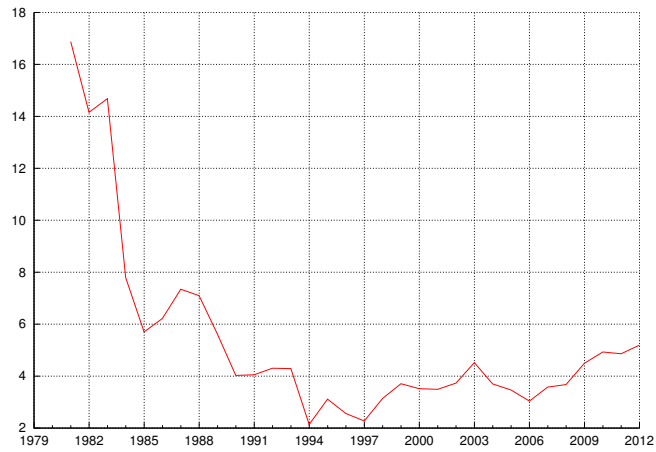
Time series plot of evolution of liquidity measures.

## **2.10 Atkins Dyl**

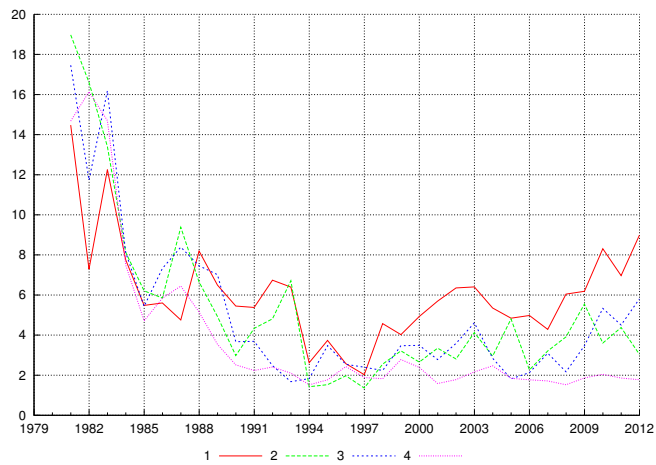
The measure used by Atkins and Dyl (1997)



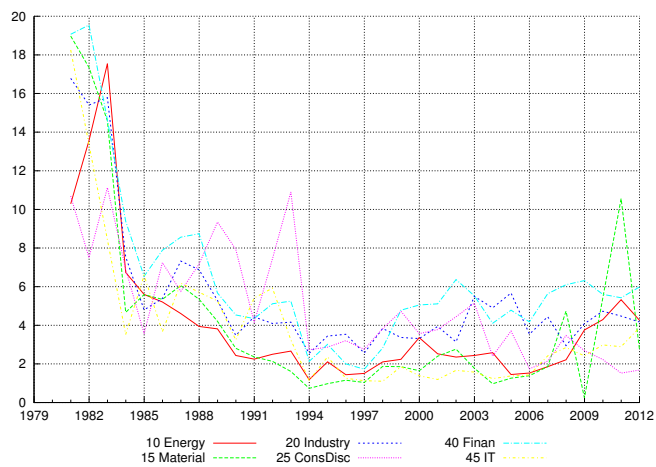
**Figure 30** Time series evolution of monthly Atkins Dyl measure



Grouped by size quartile



Grouped by industry



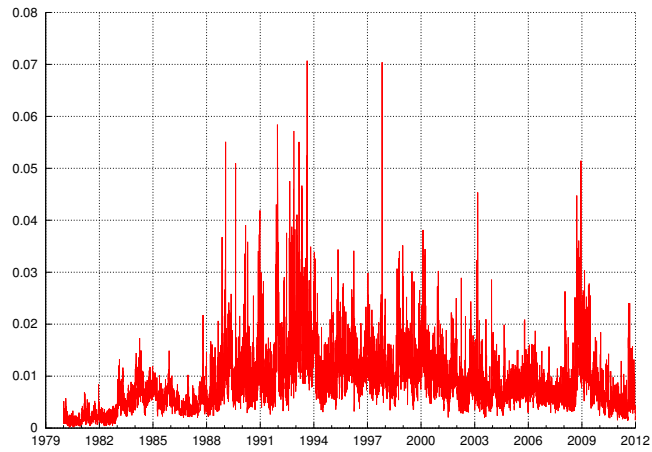
Time series plot of evolution of liquidity measures.

## 2.11 Amortized spread

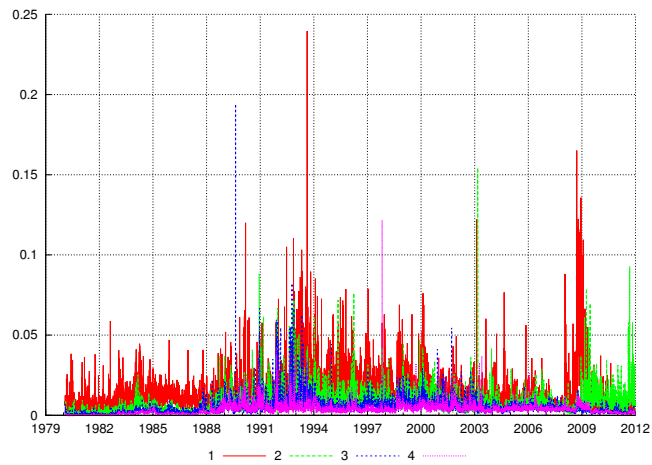
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**Figure 31** Time series evolution of Ammortized spread

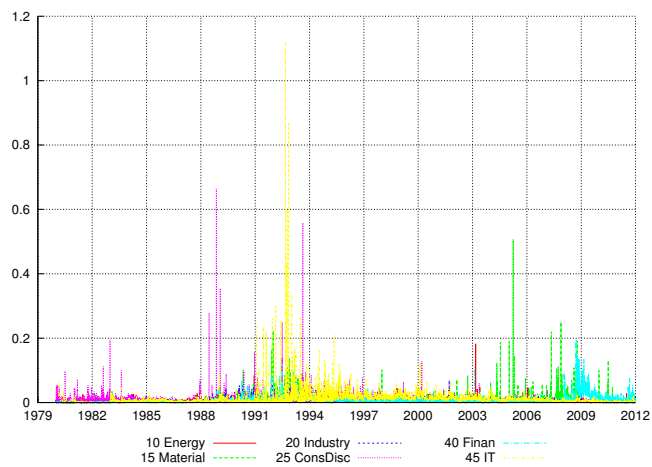
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Grouped by size quartile



Grouped by industry

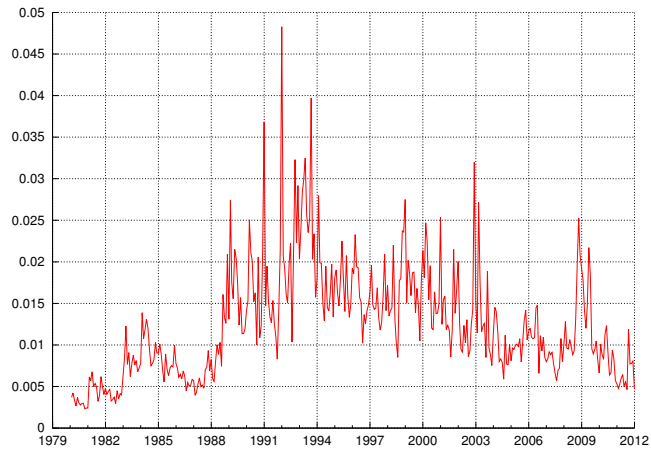


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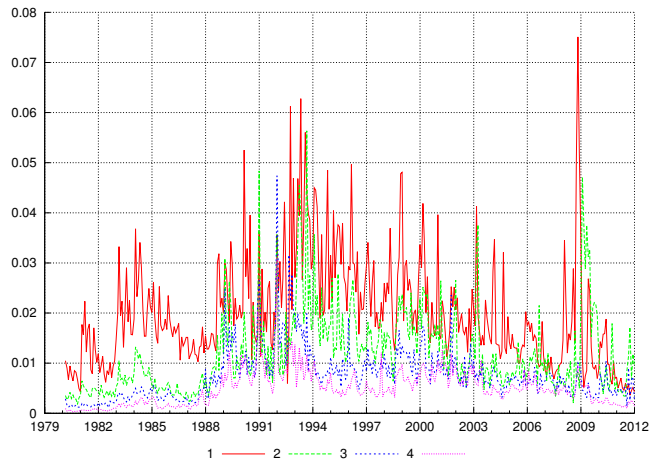
Time series plot of evolution of liquidity measures.

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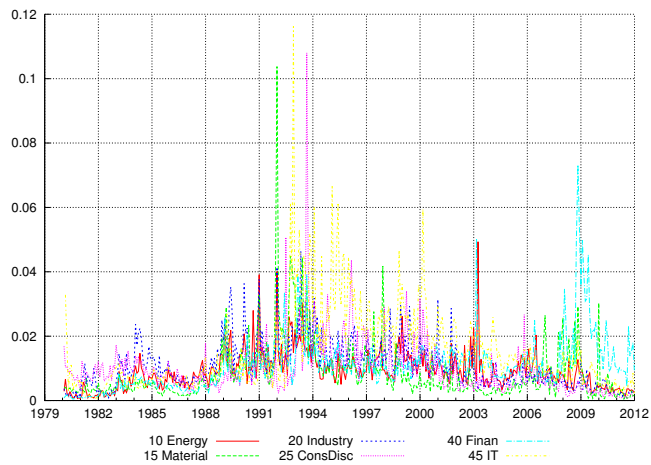
**Figure 32** Time series evolution of monthly Ammortized spread



Grouped by size quartile

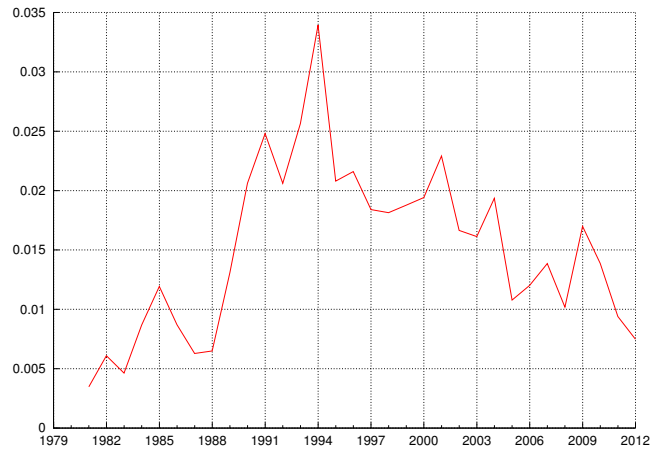


Grouped by industry

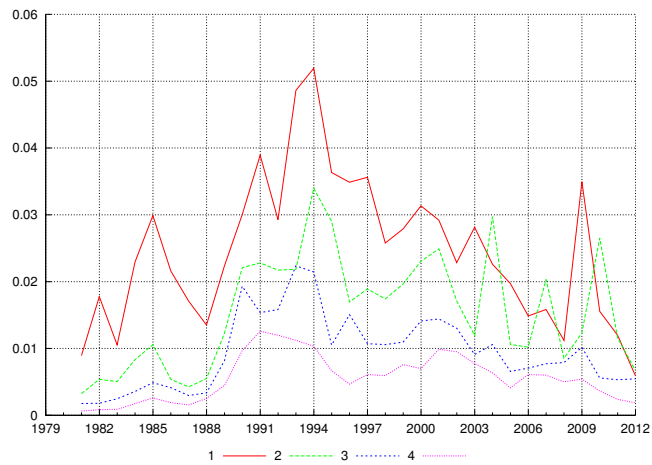


Time series plot of evolution of liquidity measures.

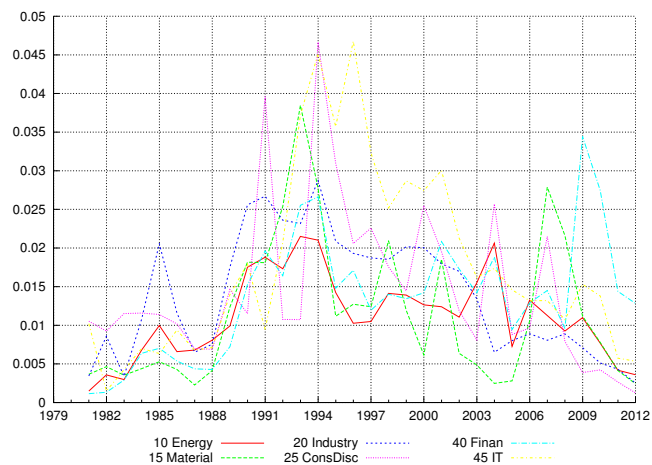
**Figure 33** Time series evolution of annual Ammortized spread



Grouped by size quartile



Grouped by industry



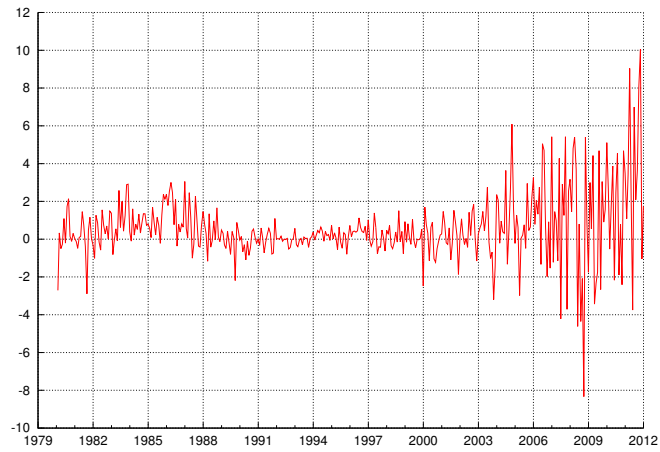
Time series plot of evolution of liquidity measures.

## 2.12 Pastor Stambaugh

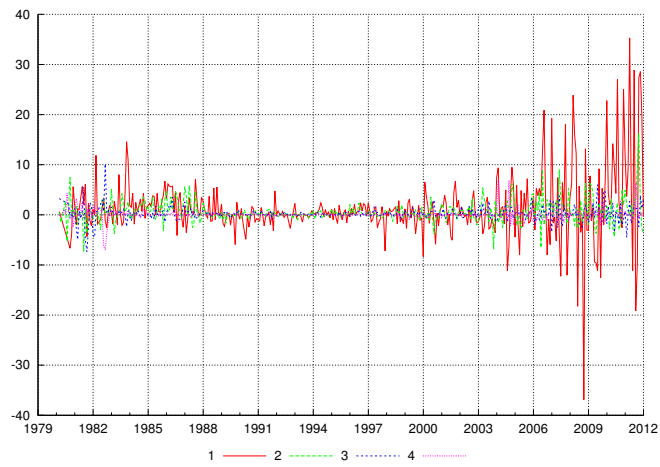
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**Figure 34** Time series evolution of quarterly Pastor Stambaugh measure

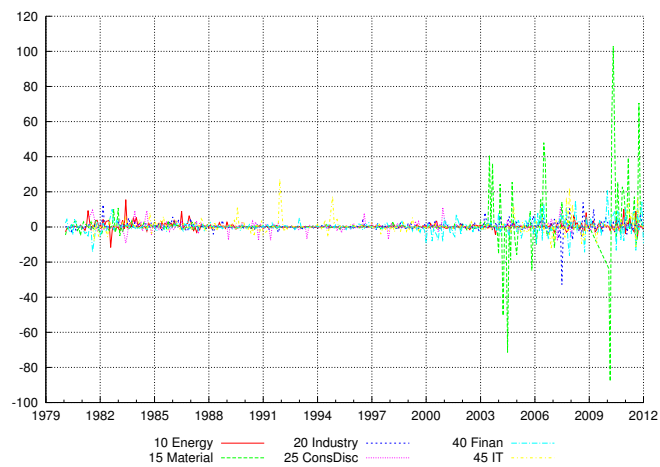
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Grouped by size quartile



Grouped by industry

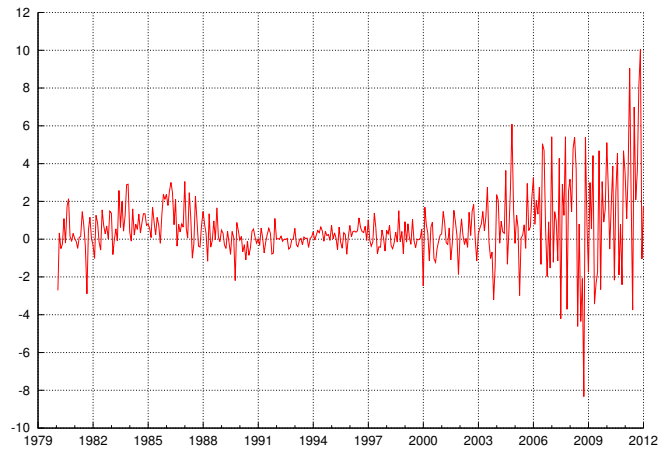


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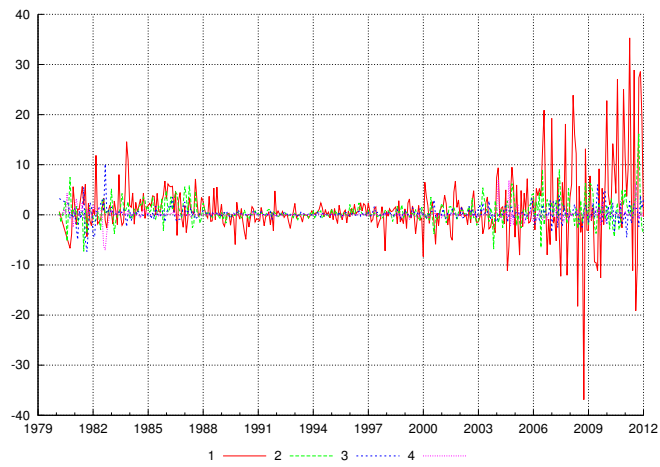
Time series plot of evolution of liquidity measures.

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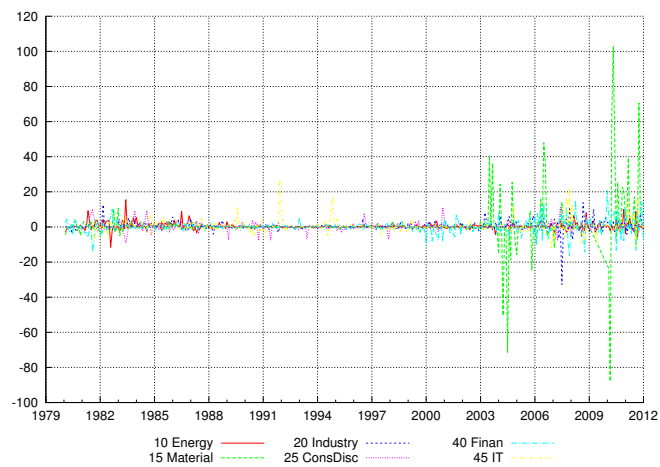
**Figure 35** Time series evolution of monthly Pastor Stambaugh measure



Grouped by size quartile



Grouped by industry



Time series plot of evolution of liquidity measures.



## References

- Allen B Atkins and Edward A Dyl. Transactions costs and holding periods for common stocks. *Journal of Finance*, 52(1):309–325, March 1997.
- Randi Næs, Johannes Skjeltorp, and Bernt Arne Ødegaard. Liquidity at the Oslo Stock Exchange. Working Paper Series, Norges Bank, ANO 2008/9, May 2008.