

Commercially used registers

Per Weidenman
PAR AB

Official Statistics

- Registers
- Surveys

Research companies

- Opinion polls
- Market research

Registers

- Public
- Administrative
- Private

Commerially used registers

- Credit
- DM
- Market

Commerially used registers

- Suppliers? Customers?
- Field of application (in business)
- Sources
- Statistical methods?

Main focus

- Registers containing micro data
- Juridical persons

Suppliers

Credit & Risk

UC Creditsafe
Business Check
Soliditet + D&B
Syna

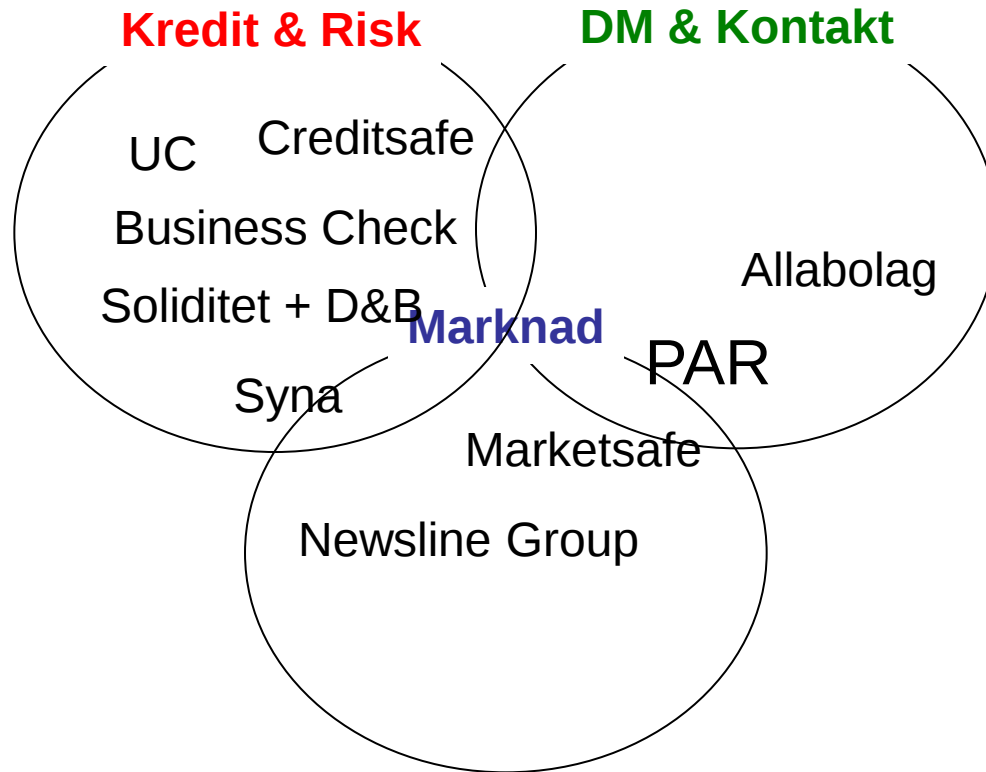
DM

Infodata Direkt
PAR Allabolag

Market

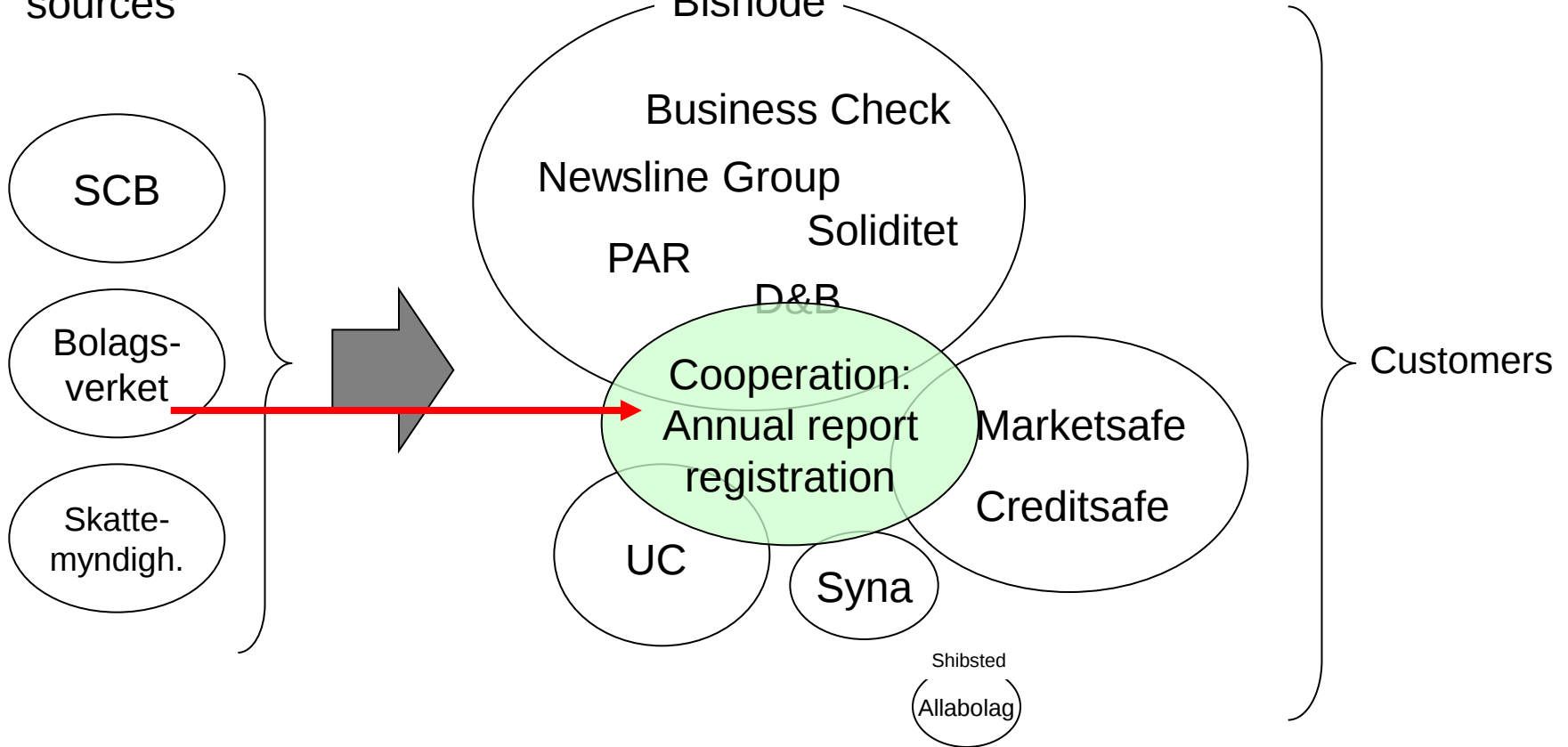
Marketsafe
Newsline Group
MM Partner

Suppliers



Suppliers

Register
sources



More info:

www.affarsinformation.se

Customer use

Field of application

- Ad hoc search
- Part of business process
- Matching (for increased data quality in own registers)
- Searching new customers
- Tabulation, reports
- Statistical analysis

A red starburst graphic with multiple points, containing the text "Registers with Micro data".

**Registers with
Micro data**

First example

Register based transport statistics for SIKa:

Decreased response burden

Increased understanding of the transporting companies (as a complement to the "usual" fokus on type of goods)

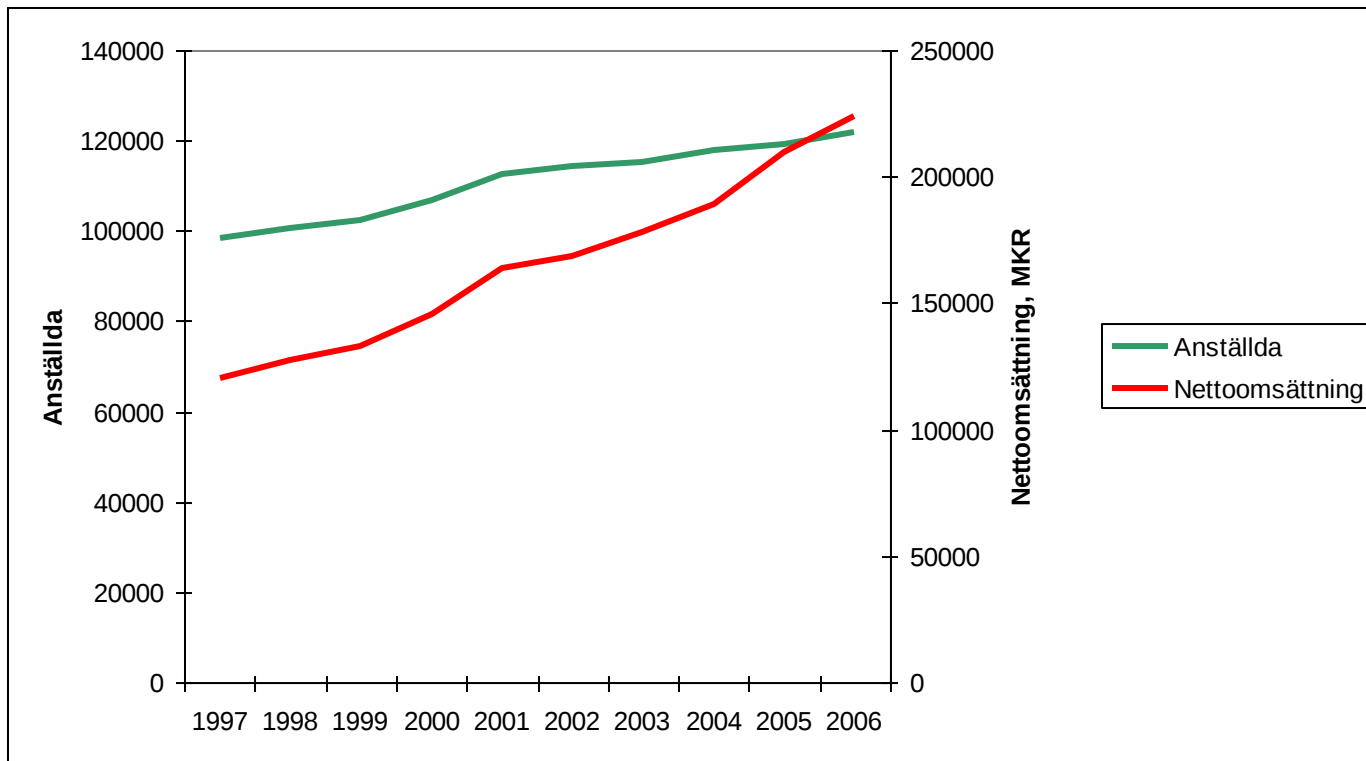
Time series describing economic status and change

.

Objective:

Describing economic status and change in transporting companies during the last ten years.

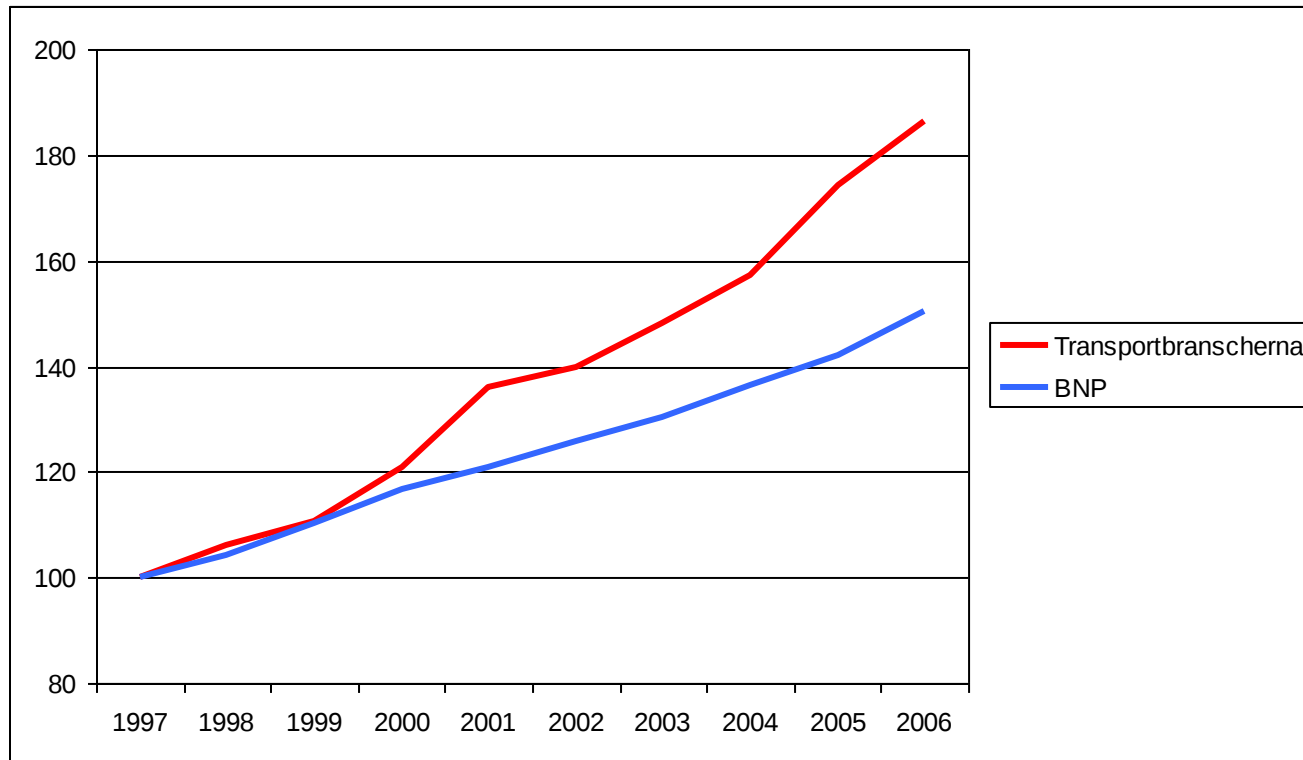
Total number of employees and turnover ...



Objective:

Describing economic status and change in transporting companies during the last ten years.

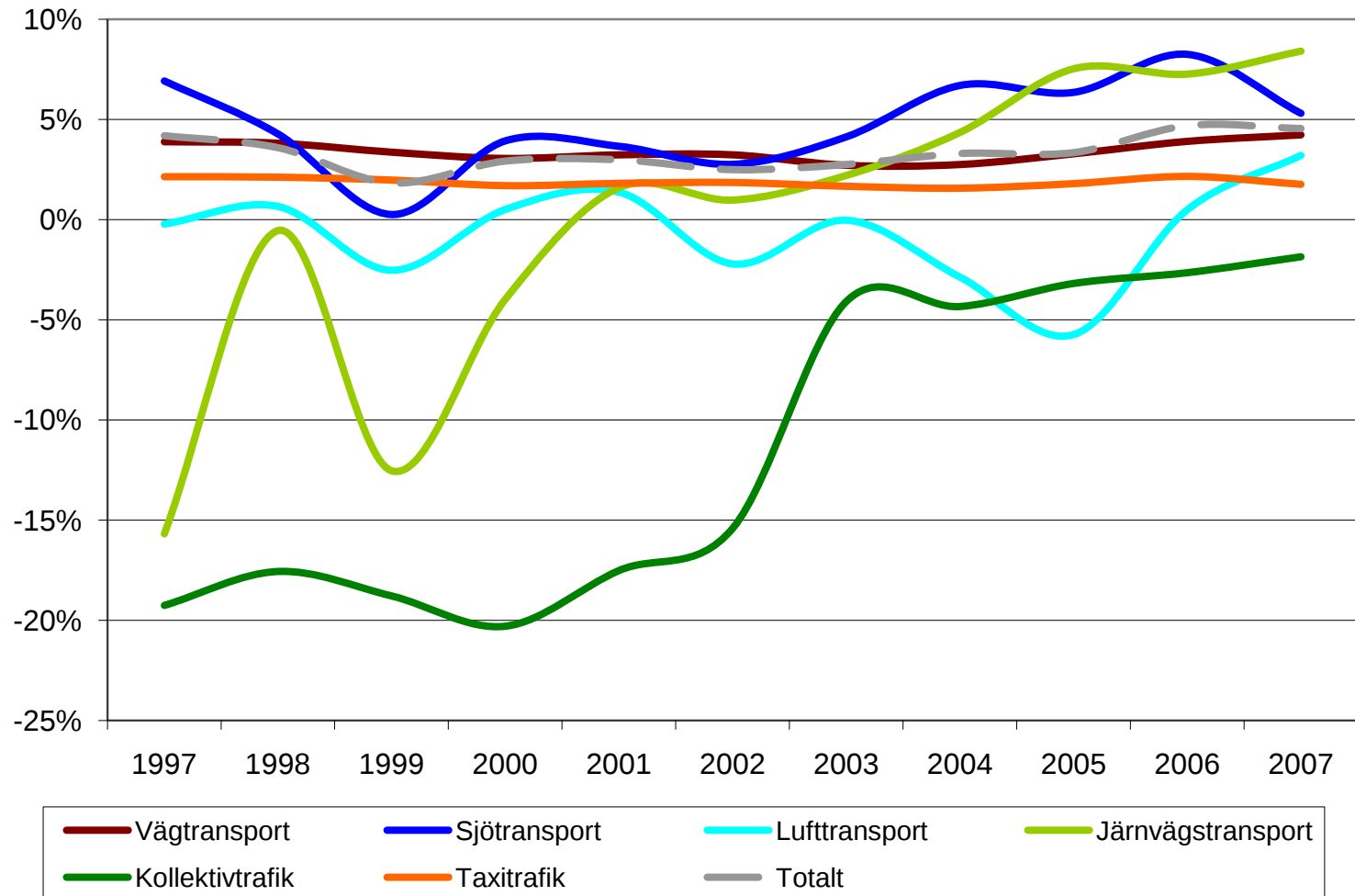
... or turnover growth compared to BNP



Objective:

Describing economic status and change in transporting companies during the last ten years.

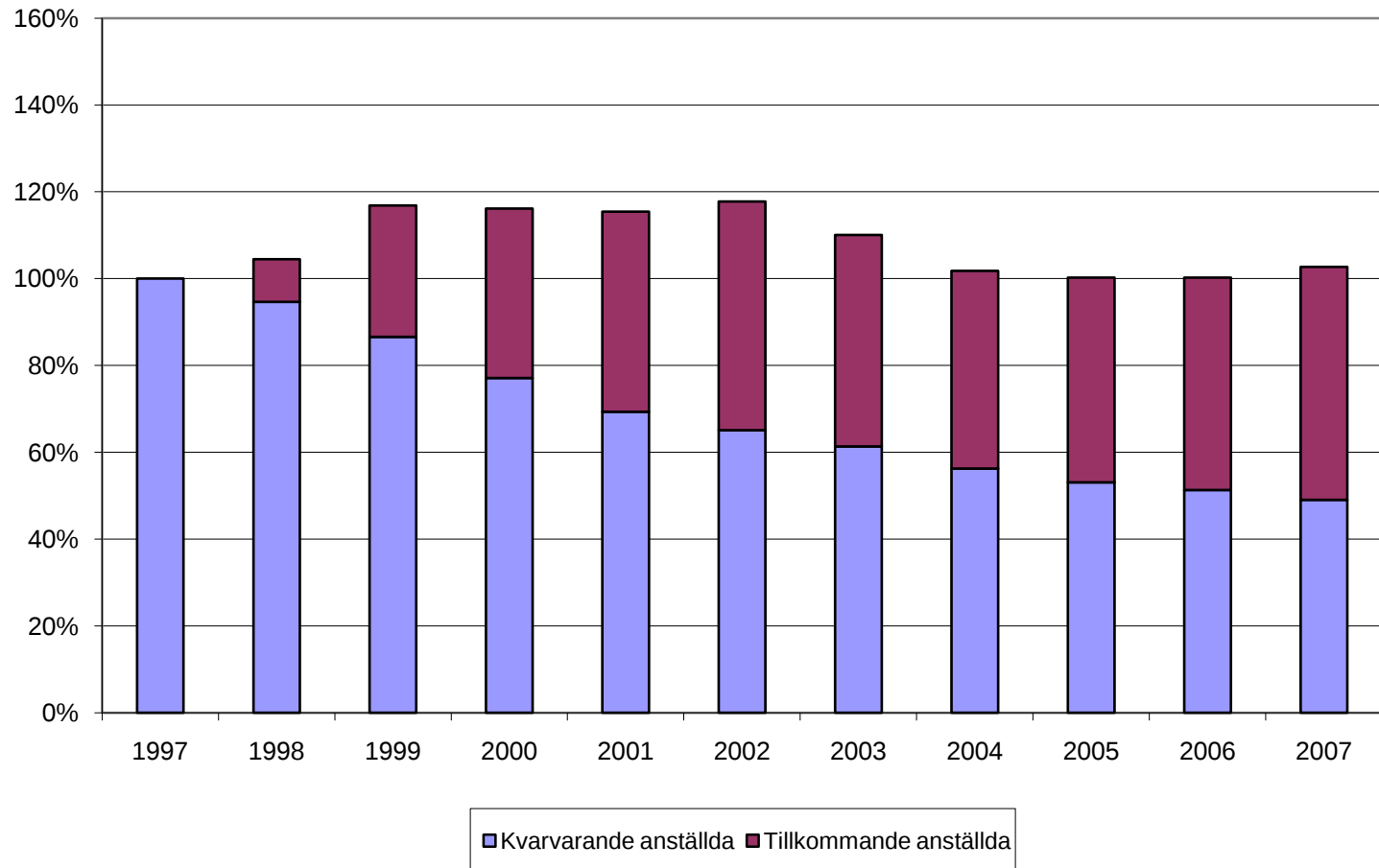
... or profit development for different types of freight companies



Objective:

Describing economic status and change in transporting companies during the last ten years.

... or the number of employees in a cohort of new companies.



Tables based on balance sheet data from each company

År	Aktiva företag		Aktiva aktiebolag		BNP
	Totalt	Därav aktiebolag	Antal anställda	Nettoomsättning (Mkr)	Löpande priser (Mkr)
1997	12912	10599	98259	120284	1927001
1998	12788	10626	100663	127745	2012091
1999	12547	10543	102531	133078	2123971
2000	12562	10704	106811	145496	2249987
2001	12383	10659	112685	163418	2326176
2002	12432	10741	114426	168214	2420761
2003	12616	10935	115135	178294	2515150
2004	12689	11067	118015	188913	2624964
2005	12709	11100	119387	209819	2735218
2006	12514	11012	121683	224225	2899653

What data is needed?

Company data including micro level history. Exactly which companies were active in transport during each year?

Balance sheet data from all transporting companies for each year

År	Aktiva företag	Aktiva aktiebolag		BNP	
	Därav aktiebolag	Antal anställda	Nettoomsättning (Mkr)	Löpande priser (Mkr)	
1997	12912	10599	98259	120284	1927001
1998	12788	10626	100663	127745	2012091
1999	12547	10543	102531	133078	2123971
2000	12562	10704	106811	145496	2249987
2001	12383	10659	112685	163418	2326176
2002	12432	10741	114426	168214	2420761
2003	12616	10935	115135	178294	2515150
2004	12689	11067	118015	188913	2624964
2005	12709	11100	119387	209819	2735218
2006	12514	11012	121683	224225	2899653

Faster access to "last years" data compared to taxation based registers

Exempel
databas

Register sources used by different suppliers

Register data from Skatteverket

- Inability to pay
- Lawsuits reg. taxes

Credit & Risk

Contact data

- Management team
- Visiting adress

DM

Lantmäteriet

- Real estate data

UC Kreditsafe

Soliditet + D&B

PAR

Allabolag

Market

Syna

Marketsafe

Company group register

Balance sheet data
registered by
the suppliers in cooperation

Newsline Group

Business, produkt ckassification

Transportstyrelsen

- Fleet size
- New cars

Press info, news, etc-

All suppliers: Data on all
juridical persons and bransches
from Företagsregister / SCB

Bolagsverket

- Board members
- Fusions, bankruptcy, ...

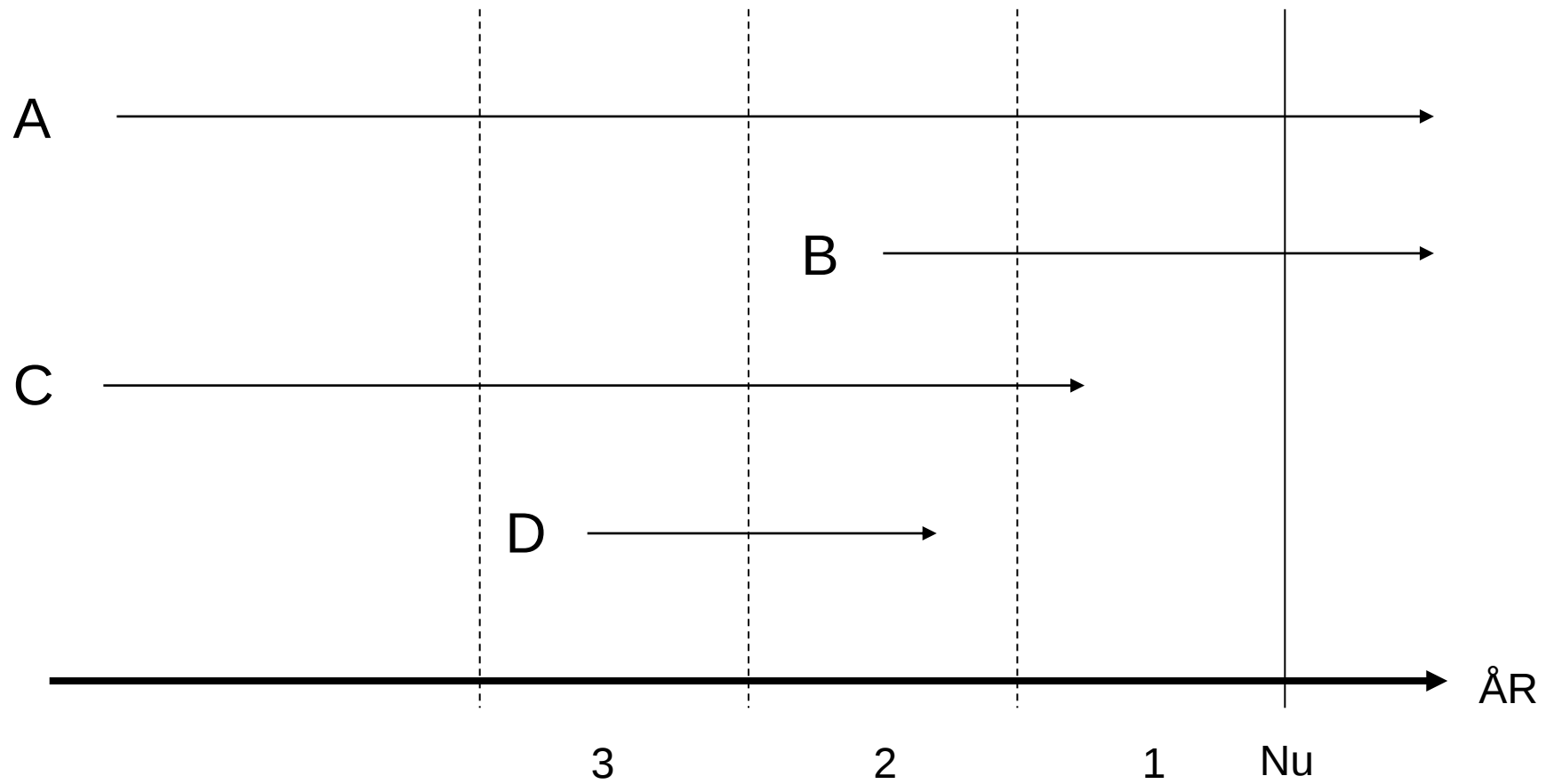
Common problems when using register data
for descriptive statistics

Sampling error concerning time series

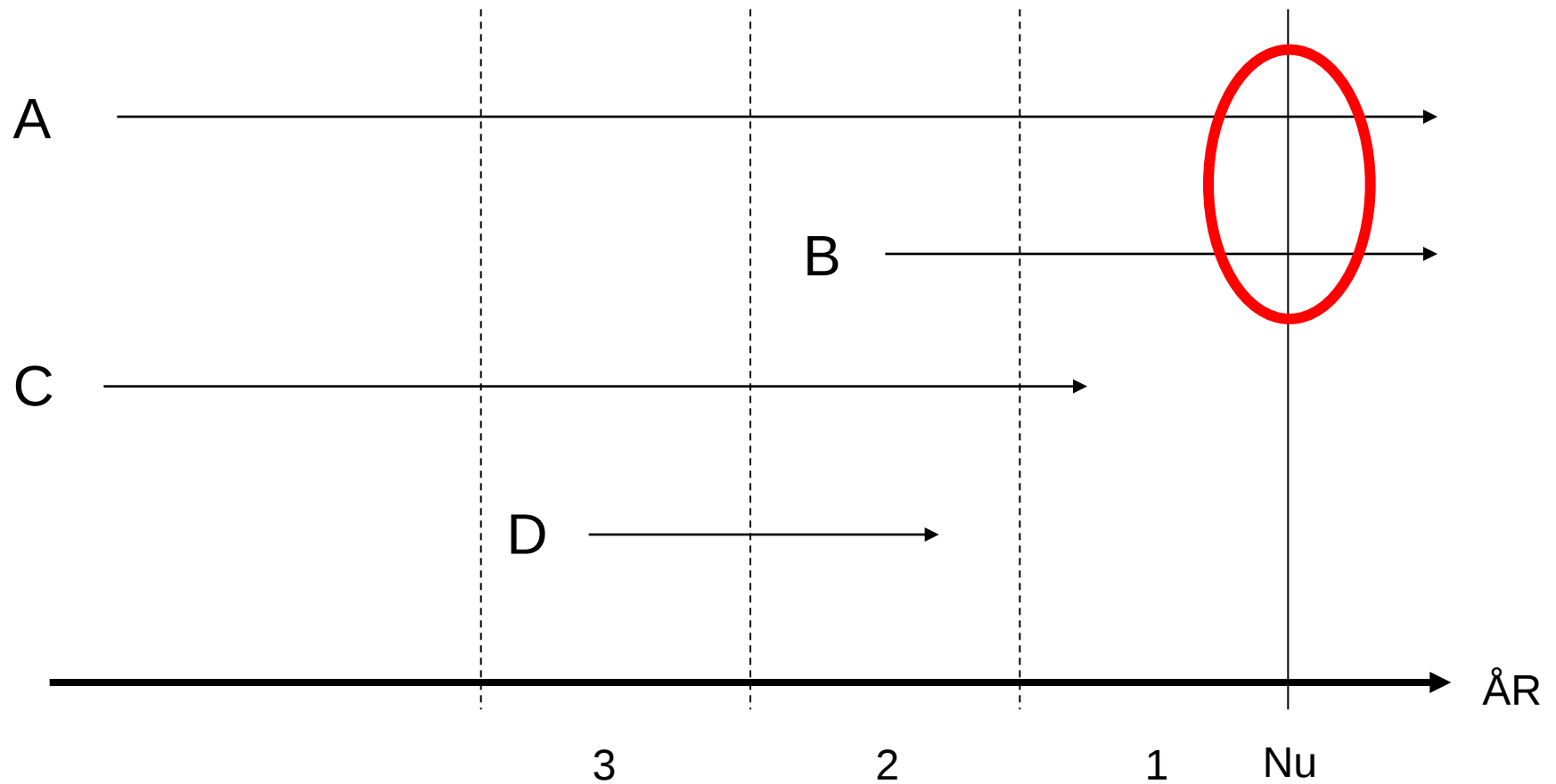
Summing up data to annual figures

▪

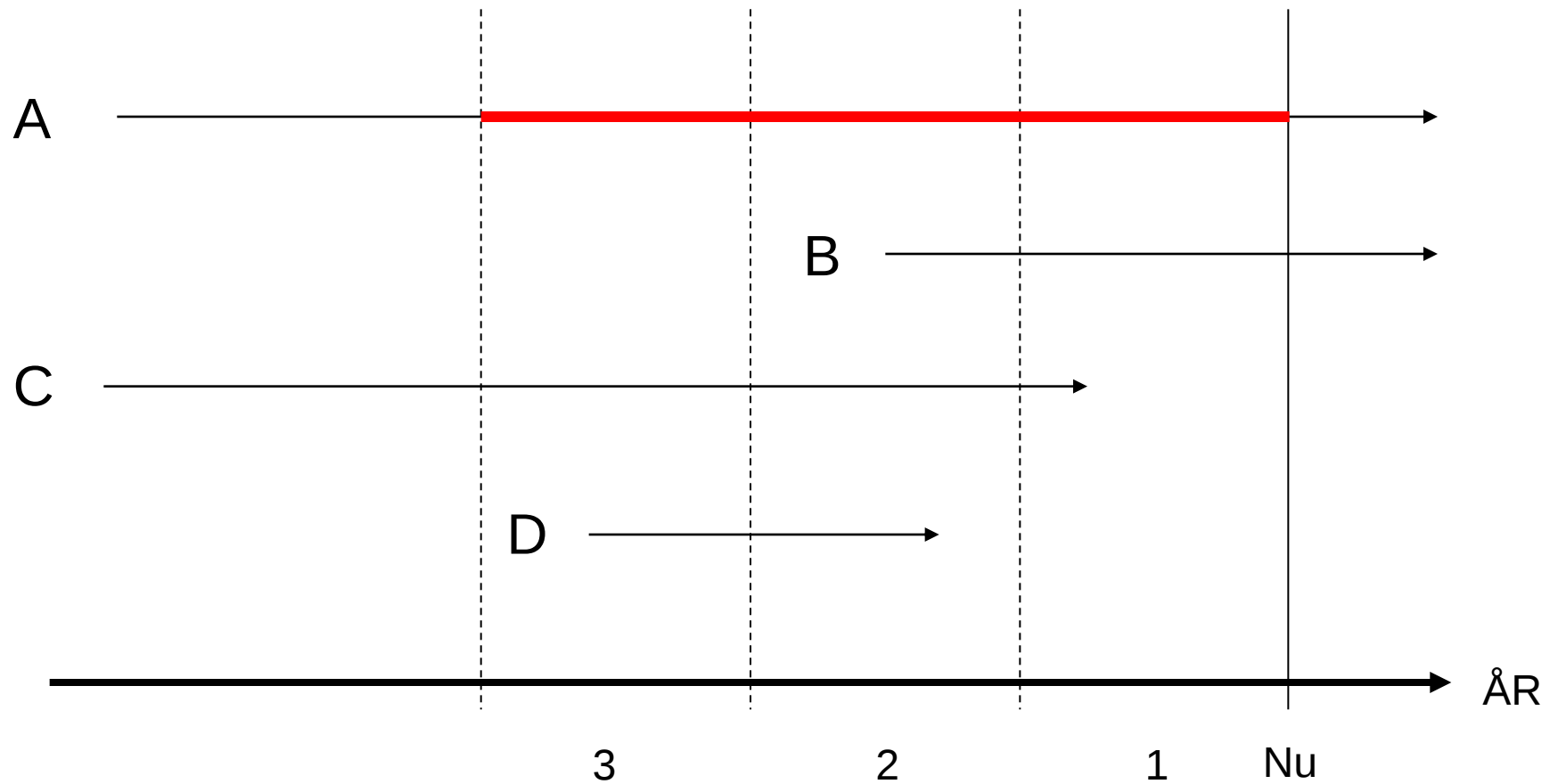
Sampling companies for time series statistics



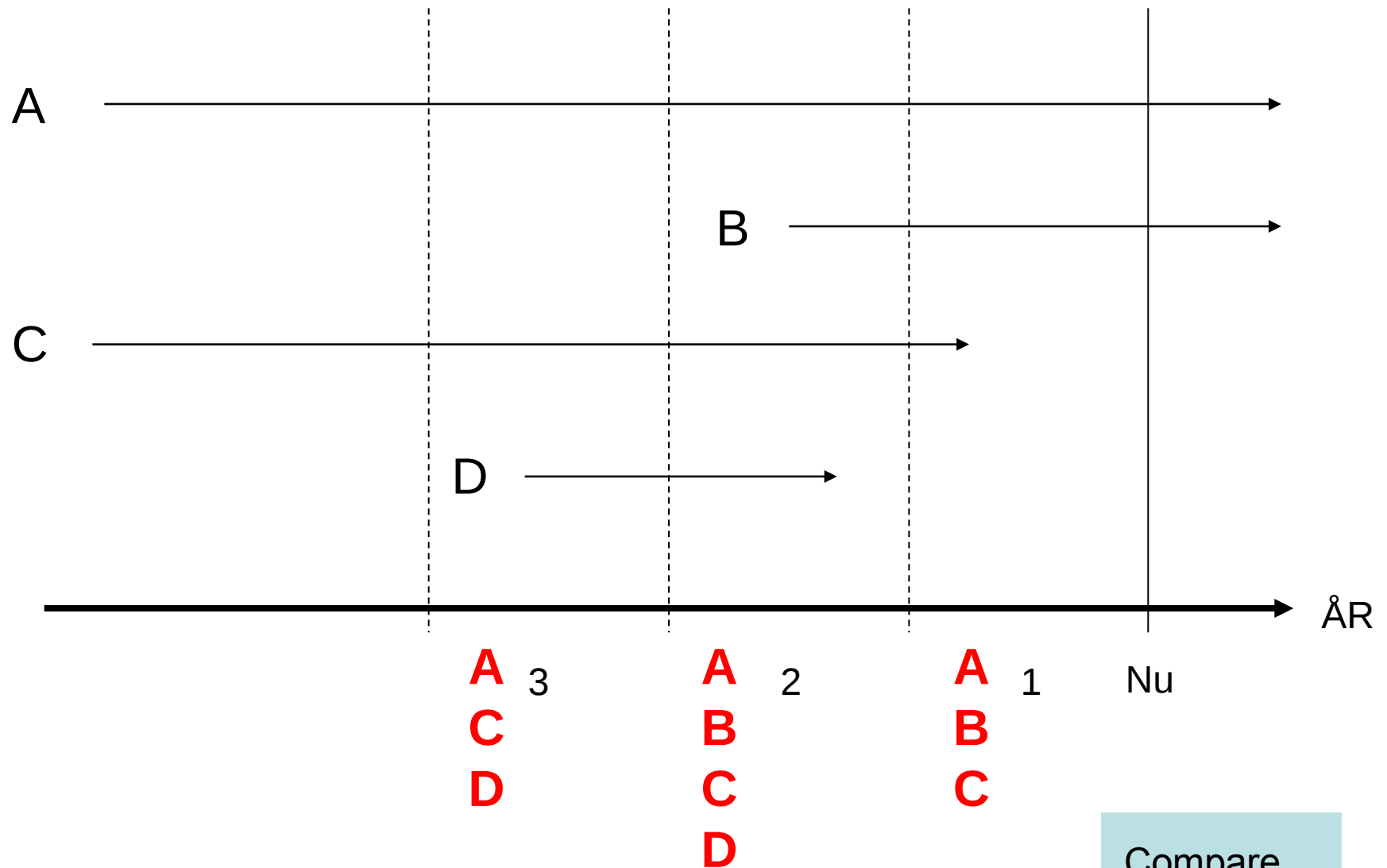
Sampling companies for time series statistics



Sampling companies for time series statistics

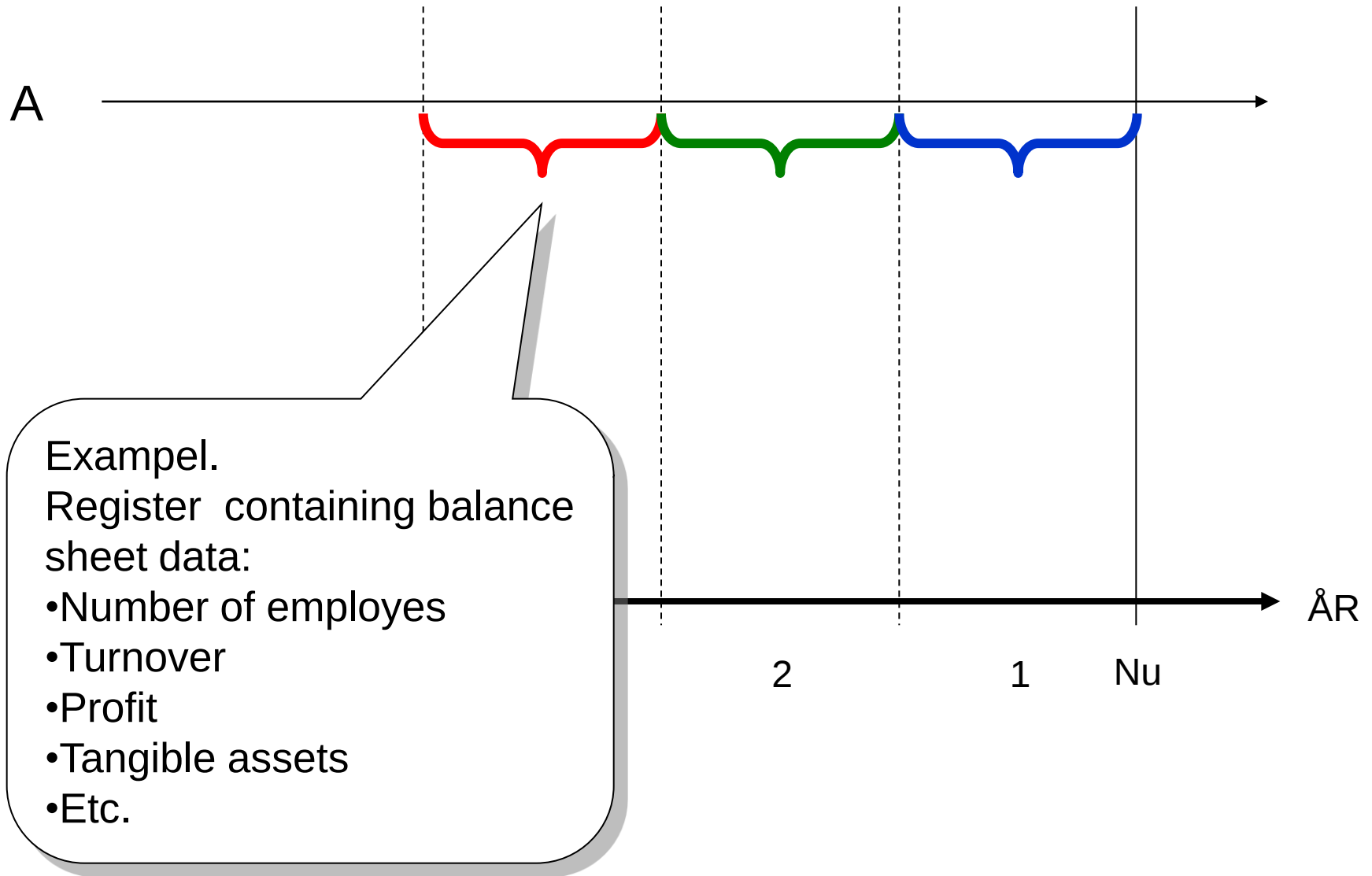


Sampling companies for time series statistics

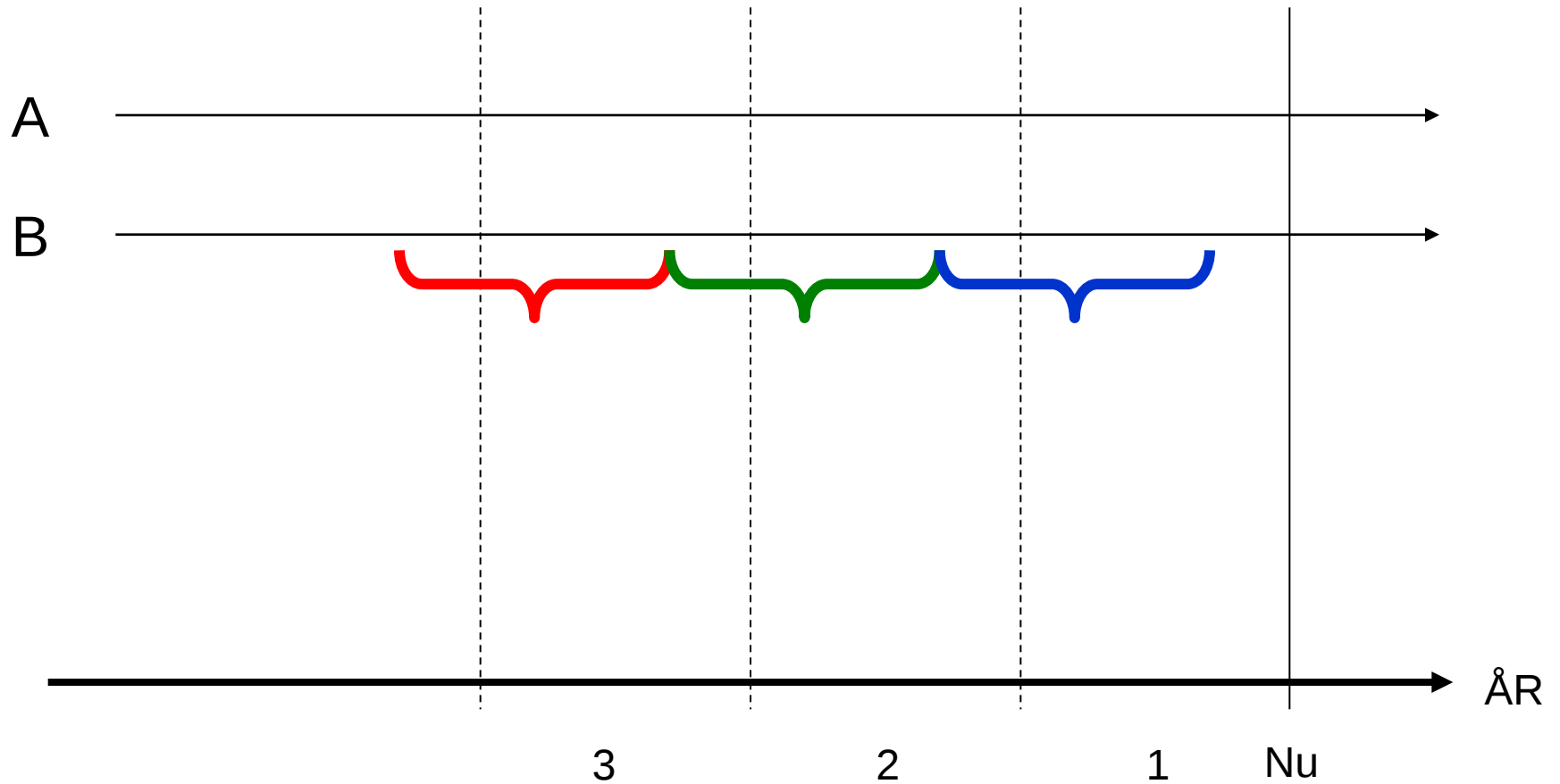


Compare...

Summing up register data to annual figures

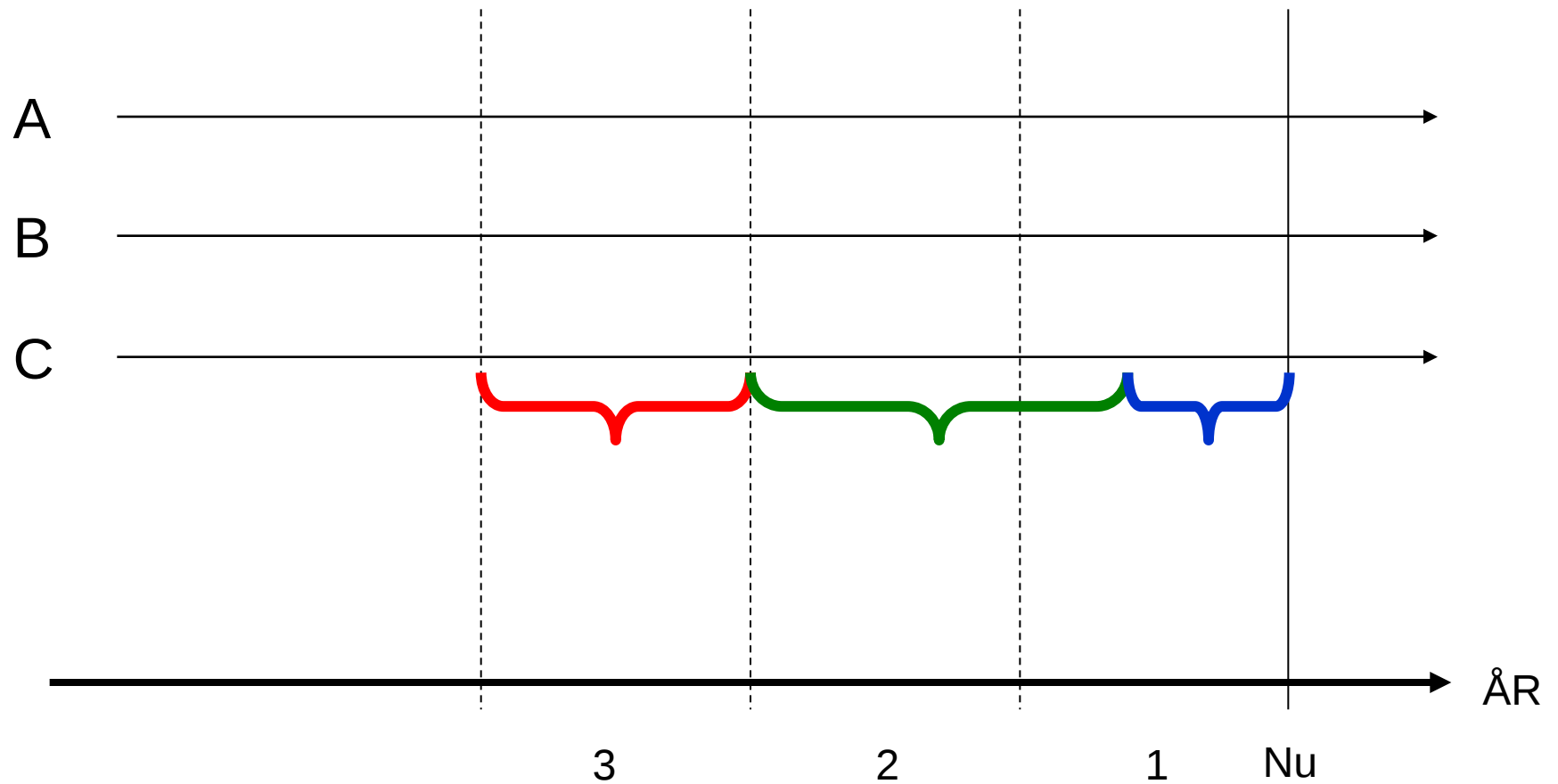


Summing up register data to annual figures



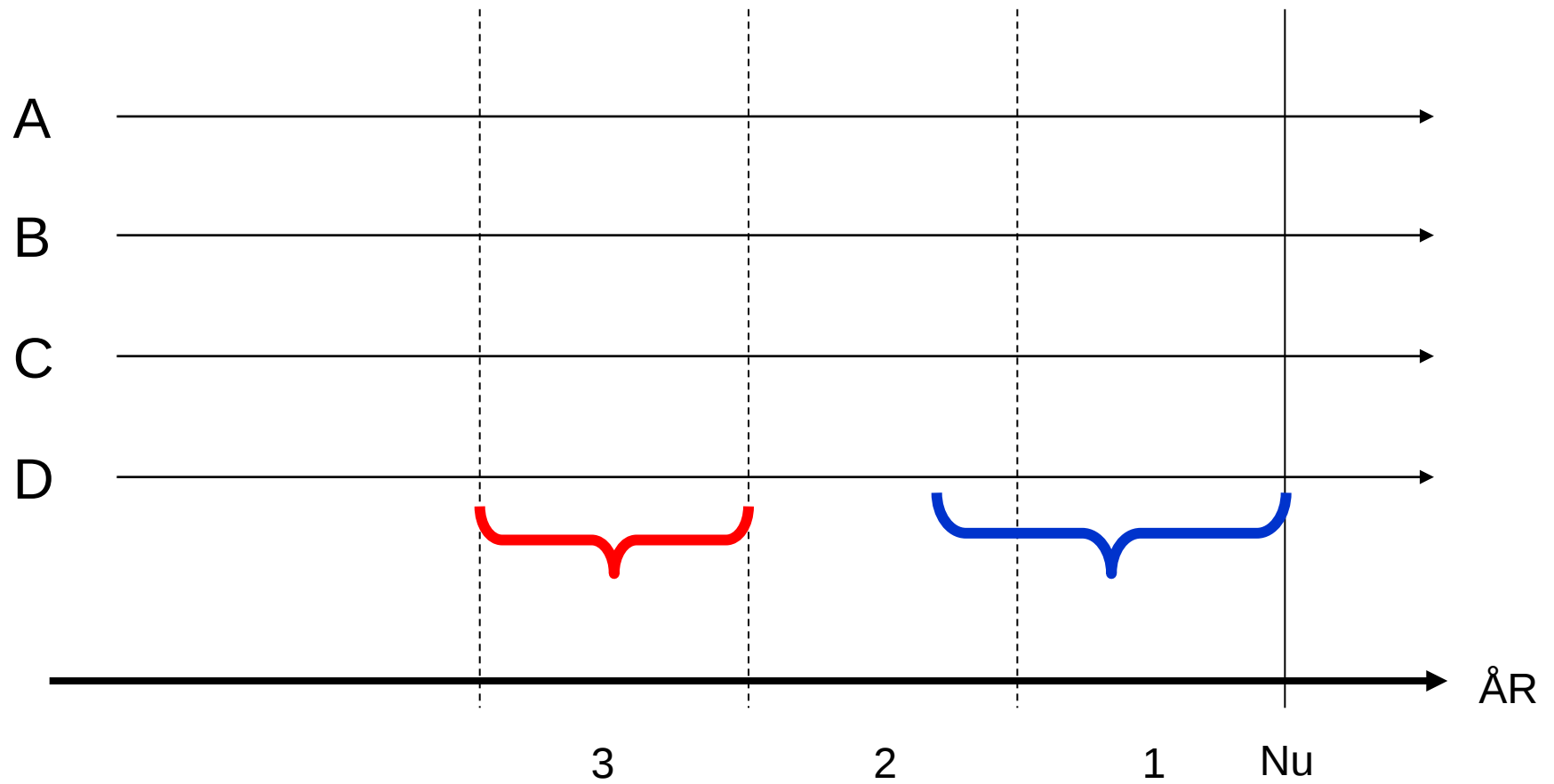
Brutet räkenskapsår

Summing up register data to annual figures



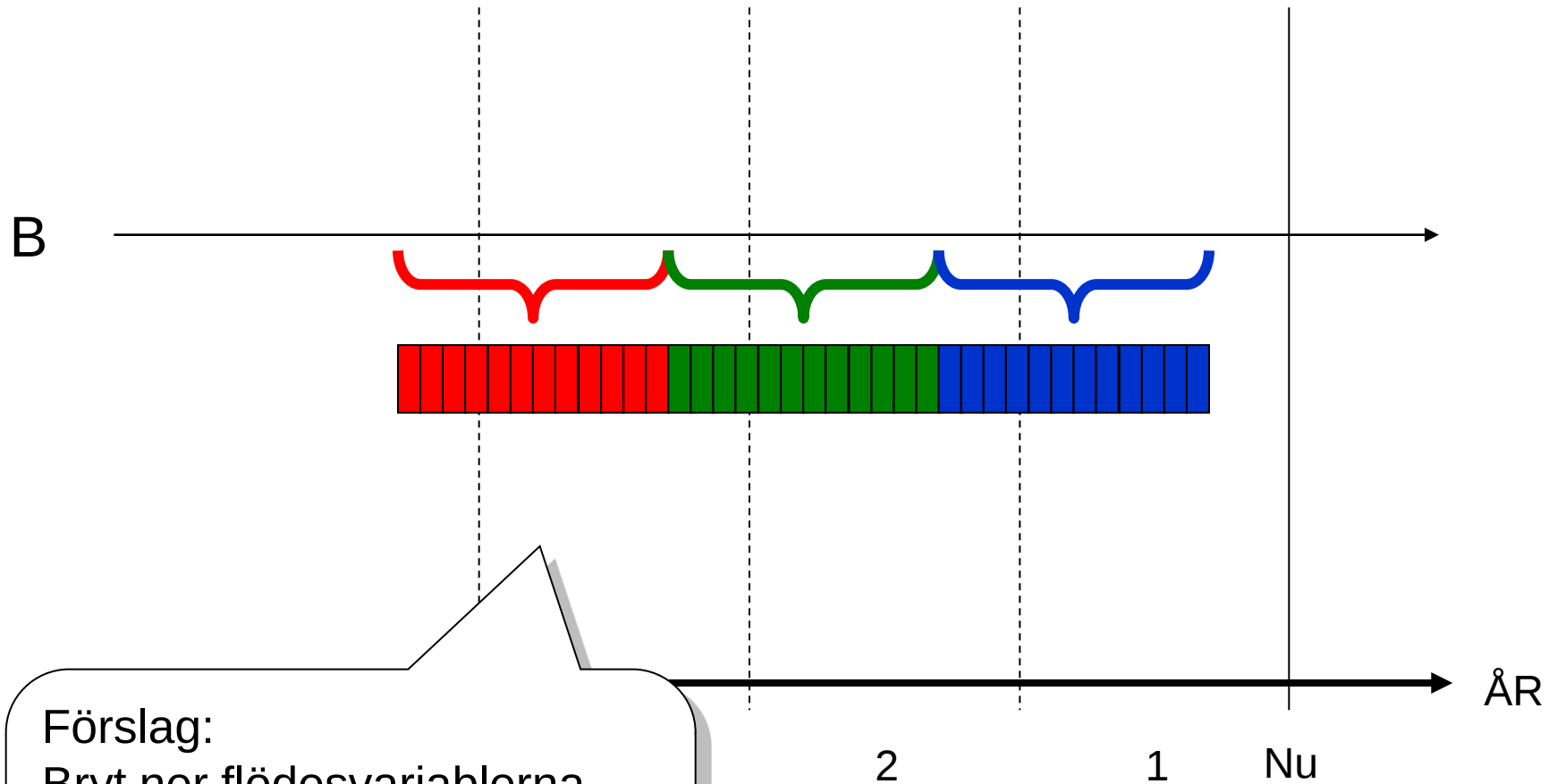
Omlagda räkenskapsår

Summing up register data to annual figures



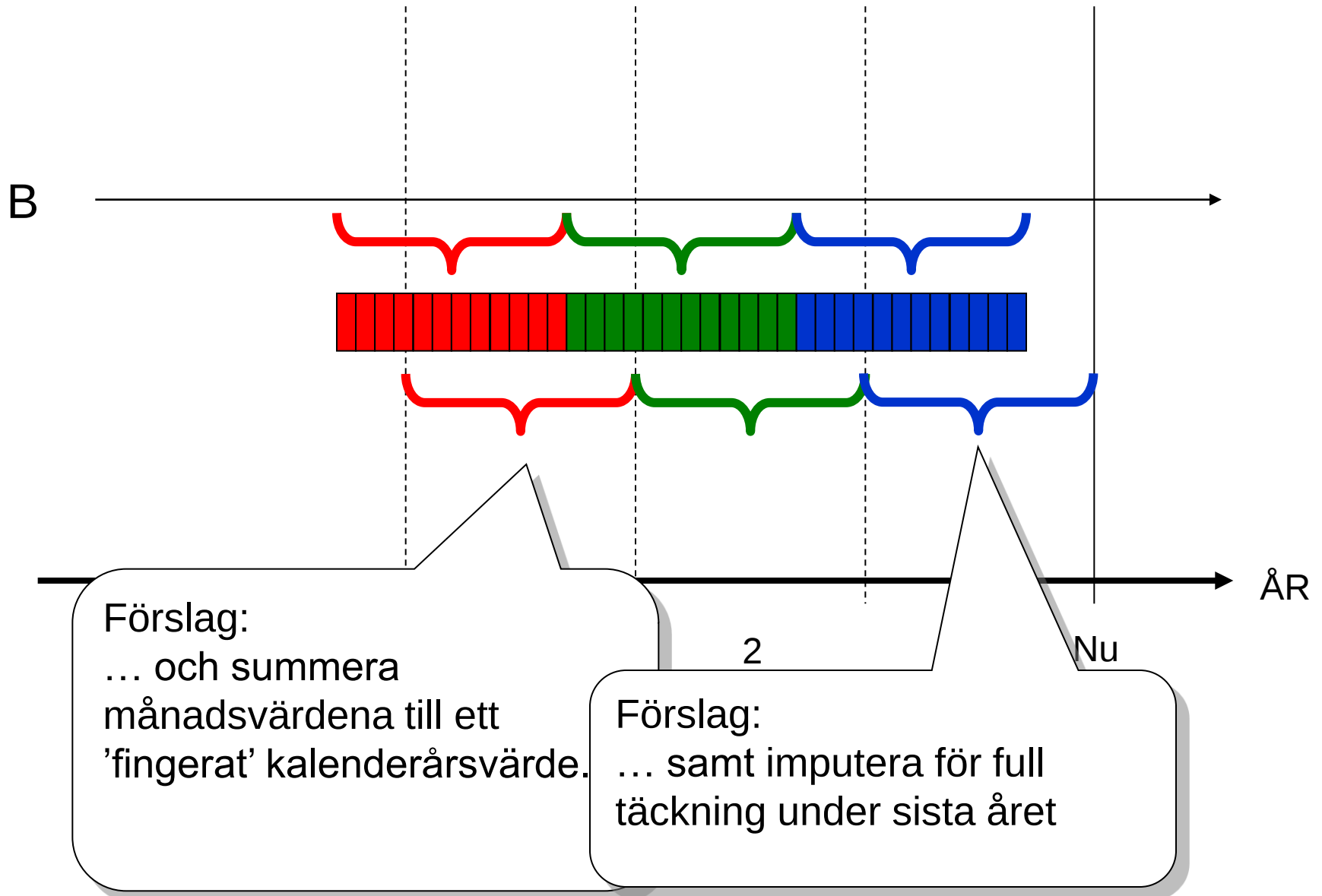
Missing data

Summing up register data to annual figures



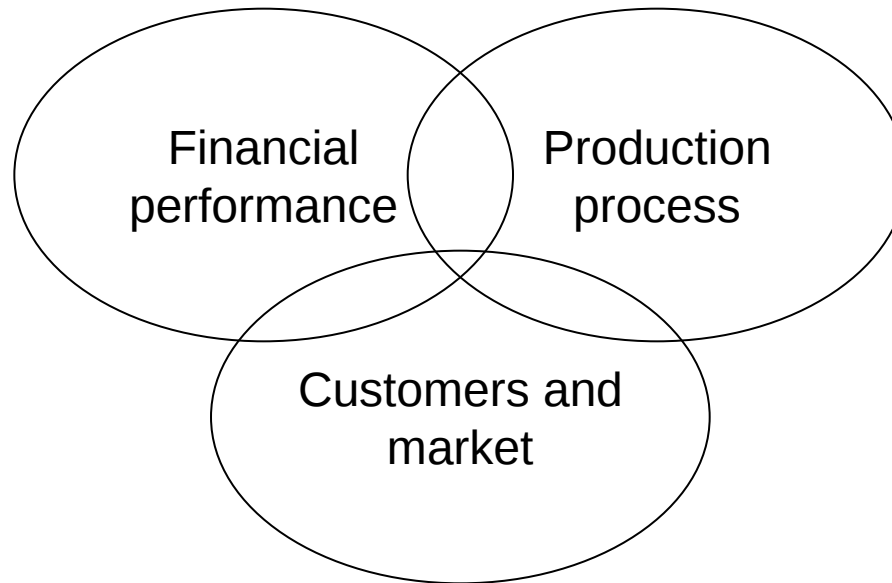
Förslag:
Bryt ner flödesvariablerna
(omsättning, vinst, etc.) till
månadsvärden ...

Summing up register data to annual figures



Register use from a customer point of view

Analytics: fields of application for
increased competitive power



Register use from a customer point of view

Focus: customers and market

Finding new customers

Planning / executing sales and marketing

Reducing risk – customer credits

Business Intelligence: markets and competitors

.

Register use from a customer point of view

Useful registers

The diagram consists of two circles. The left circle is labeled 'Internal: customer register' and 'Transaction per customer, including history'. The right circle is labeled 'External register' and contains a bulleted list: '•Credit & Risk' (red), '•DM' (green), and '•Market' (blue).

Internal:
customer register
Transaction per
customer, including
history

External register

- Credit & Risk

- DM

- Market

Register use from a customer point of view

Internal customer register

Objective:

Estimate probability for repeat business > optimize sales in different segments

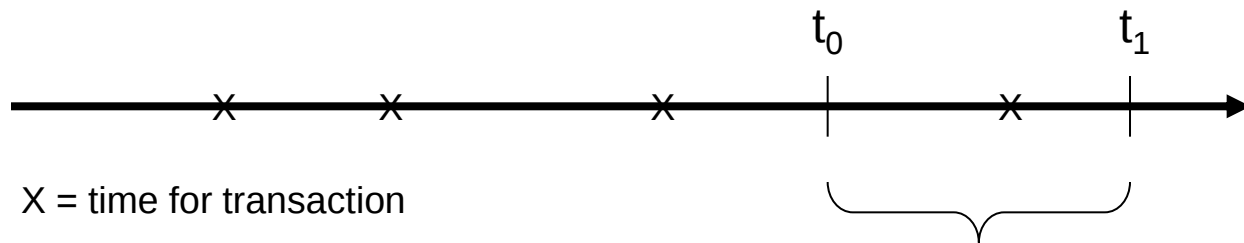
Estimate Customer Lifetime Value > calculate the financial value of the customer base

Input to company valuation models

.

Register use from a customer point of view

RFM-models



X = time for transaction

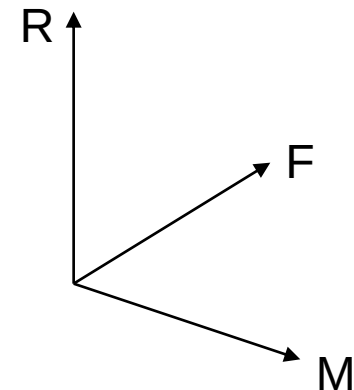
R = time to last transaction before t_0

F = number of transactions before t_0

M = sum of money from earlier transactions

Period T

Elementary use:



Register use from a customer point of view

RFM-modeller

Schmittlein, David C., Donald G. Morrison, and Richard Colombo (1987), "Counting Your Customers: Who They Are and What Will They Do Next?" *Management Science*, 33 (January), 1-24

Fader, Peter S., Bruce G. S. Hardie, and Ka Lok Lee (2004), "Counting Your Customers the Easy Way: An Alternative to the Pareto/NBD Model", *Market Science* (forthcoming)

Colombo, Richard, and Jiang Weina (1998), "A Stochastic RFM Model", *Journal of Interactive Marketing*, Volume 13 (Summer) 2-12

Pfeifer, Phillip E., and Carraway, Robert L., "Modeling Customer Relationships as Markov Chains", *Journal of Interactive Marketing*, Volume 14 (Spring 2000) 43-55



Exampel: InkClub

More...

Register use from a customer point of view

Useful registers

The diagram consists of two circles. The left circle is labeled 'Internal: customer register' and 'Transaction per customer, including history'. The right circle is labeled 'External register' and contains a bulleted list: '•Credit & Risk' (red), '•DM' (green), and '•Market' (blue).

Internal:
customer register
Transaction per
customer, including
history

External register

- Credit & Risk

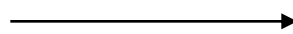
- DM

- Market

Register use from a customer point of view

External registers

Credit & Risk



Probability for bankruptcy based on stock market data

DM

Market

Probability for bankruptcy based on accounting figures



Altman, E., (1968): "Financial Ratios, Discriminant Analysis and the Prediction of Corporate Bankruptcy", *Journal of Finance*, 23, 689-609

Ohlson, J., (1980): "Financial Ratios and the Probabilistic Prediction of Bankruptcy", *Journal of Accounting Research*, 19, 109-131

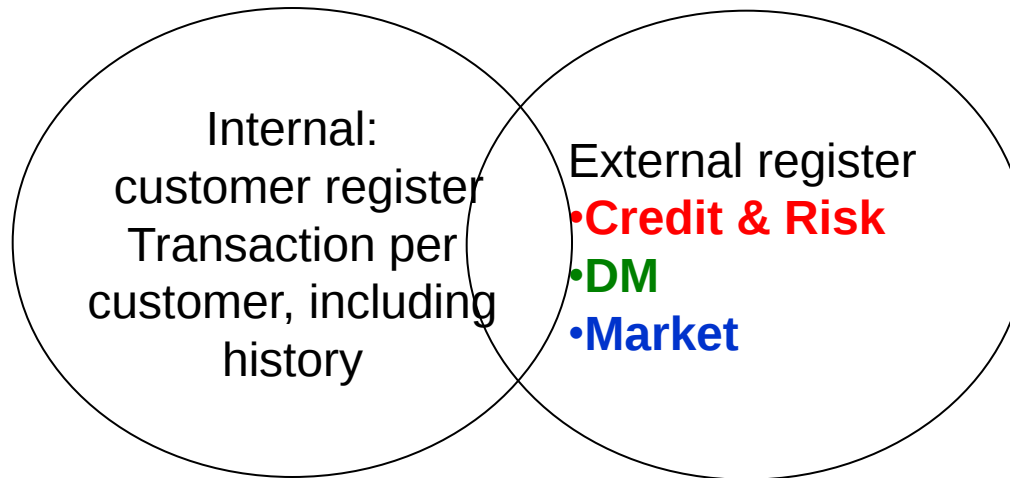
'Demografic metod', modelling lifetime using proportional hazard / Cox regression

Moody's riskmodel: scorecard



Register use from a customer point of view

Combination of internal and external registers



Prediction model
Firm of accountants

END

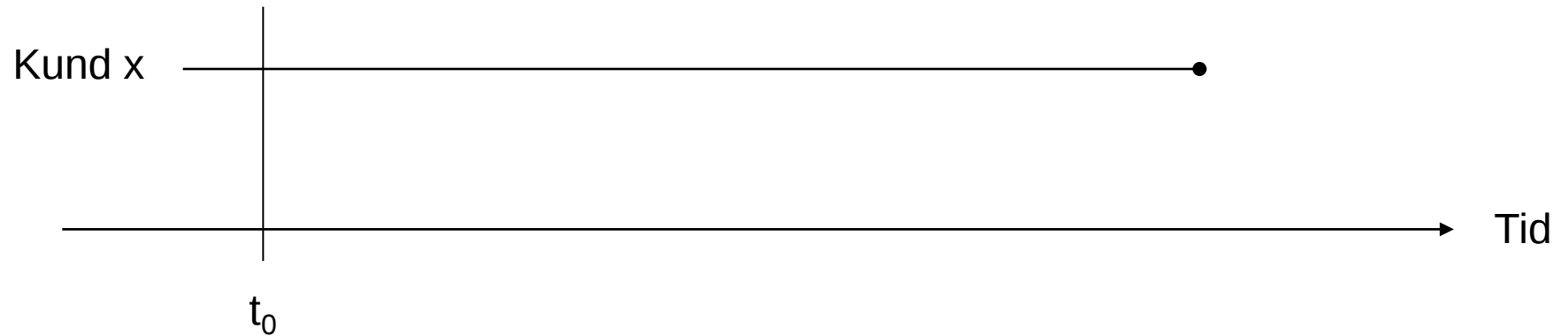
År	Aktiva företag		Aktiva aktiebolag		BNP
	Totalt	Därav aktiebolag	Antal anställda	Nettoomsättning (Mkr)	Löpande priser (Mkr)
1997	12912	10599	98259	120284	1927001
1998	12788	10626	100663	127745	2012091
1999	12547	10543	102531	133078	2123971
2000	12562	10704	106811	145496	2249987
2001	12383	10659	112685	163418	2326176
2002	12432	10741	114426	168214	2420761
2003	12616	10935	115135	178294	2515150
2004	12689	11067	118015	188913	2624964
2005	12709	11100	119387	209819	2735218
2006	12514	11012	121683	224225	2899653



Pareto/NBD model for customer behaviour

The number of transactions during time interval t is Poisson with transaction rate λ

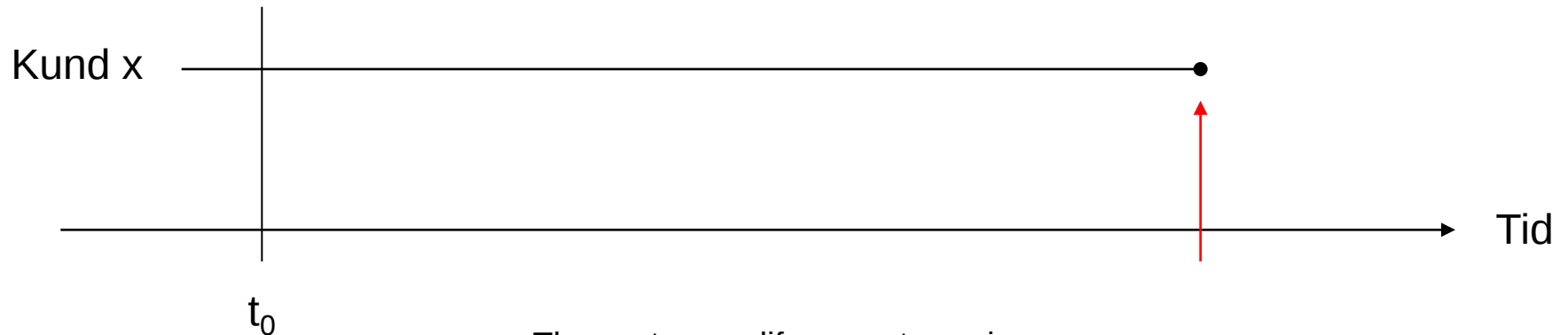
Over all customers λ is gamma distributed with parameters r and α



Pareto/NBD model for customer behaviour

The number of transactions during time interval t is Poisson with transaction rate λ

Over all customers λ is gamma distributed with parameters r and α



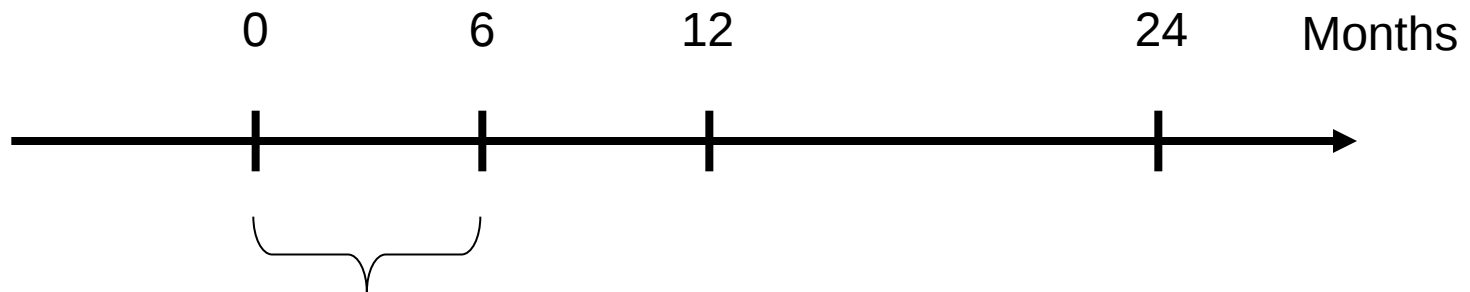
The customers life expectancy is
Exponentially distributed with dropout rate μ

Over all customers μ is gamma distributed with
parameters s and β

λ and μ are independent

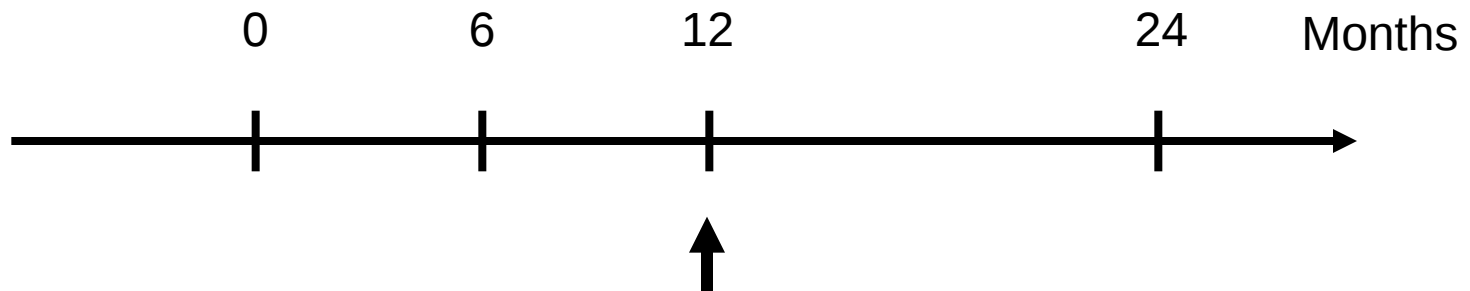


Prediction model for buying behaviour



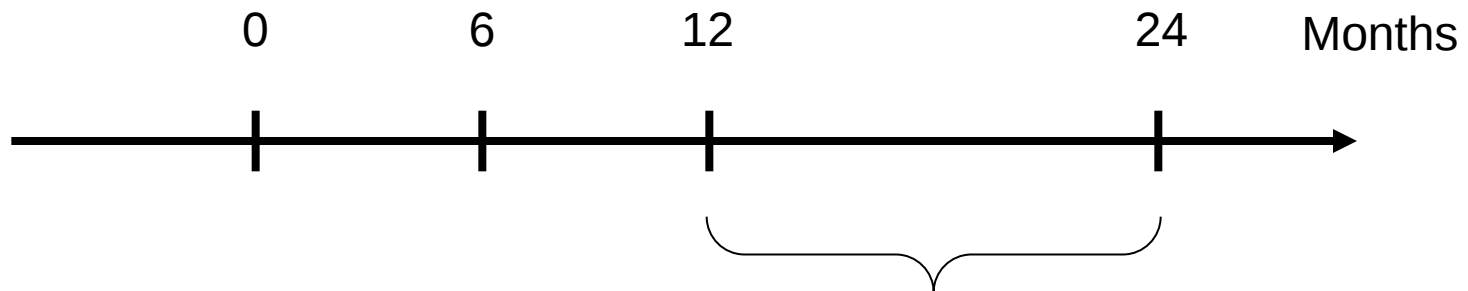
A sales activity has generated a number of new customers during the first six months.

Prediction model for buying behaviour



At the end of the year we
need to predict: how will
repeat business look like
during the coming year?

Prediction model for buying behaviour



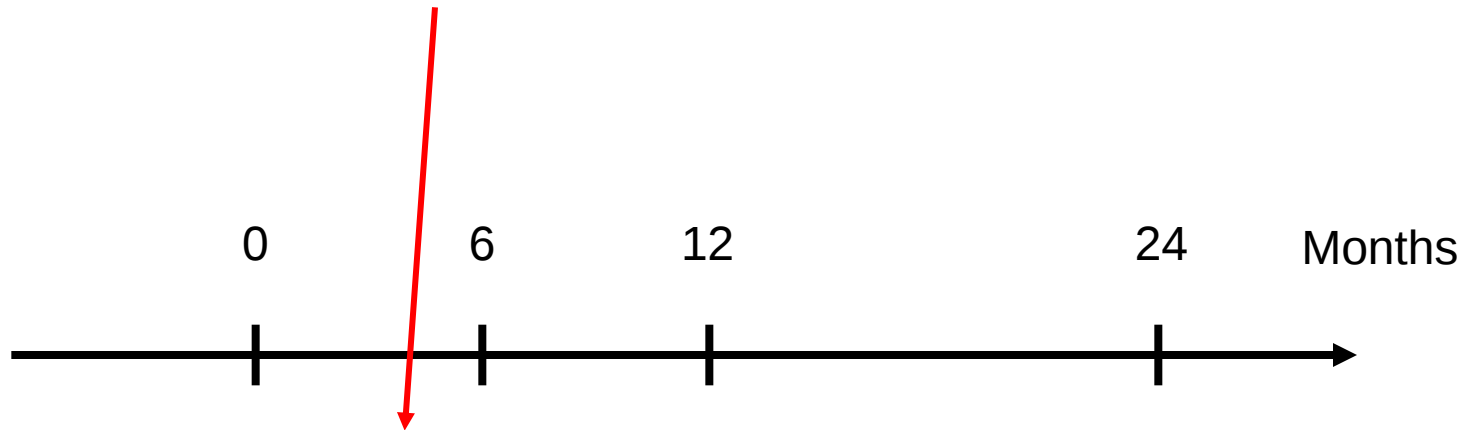
The prediction will give us expected buying frequency during chosen period.

Multiply with expected sales sum > CLV for new customers.

Prediction model for buying behaviour

Input data for the model:

- Number of additional sales during first 12 months.



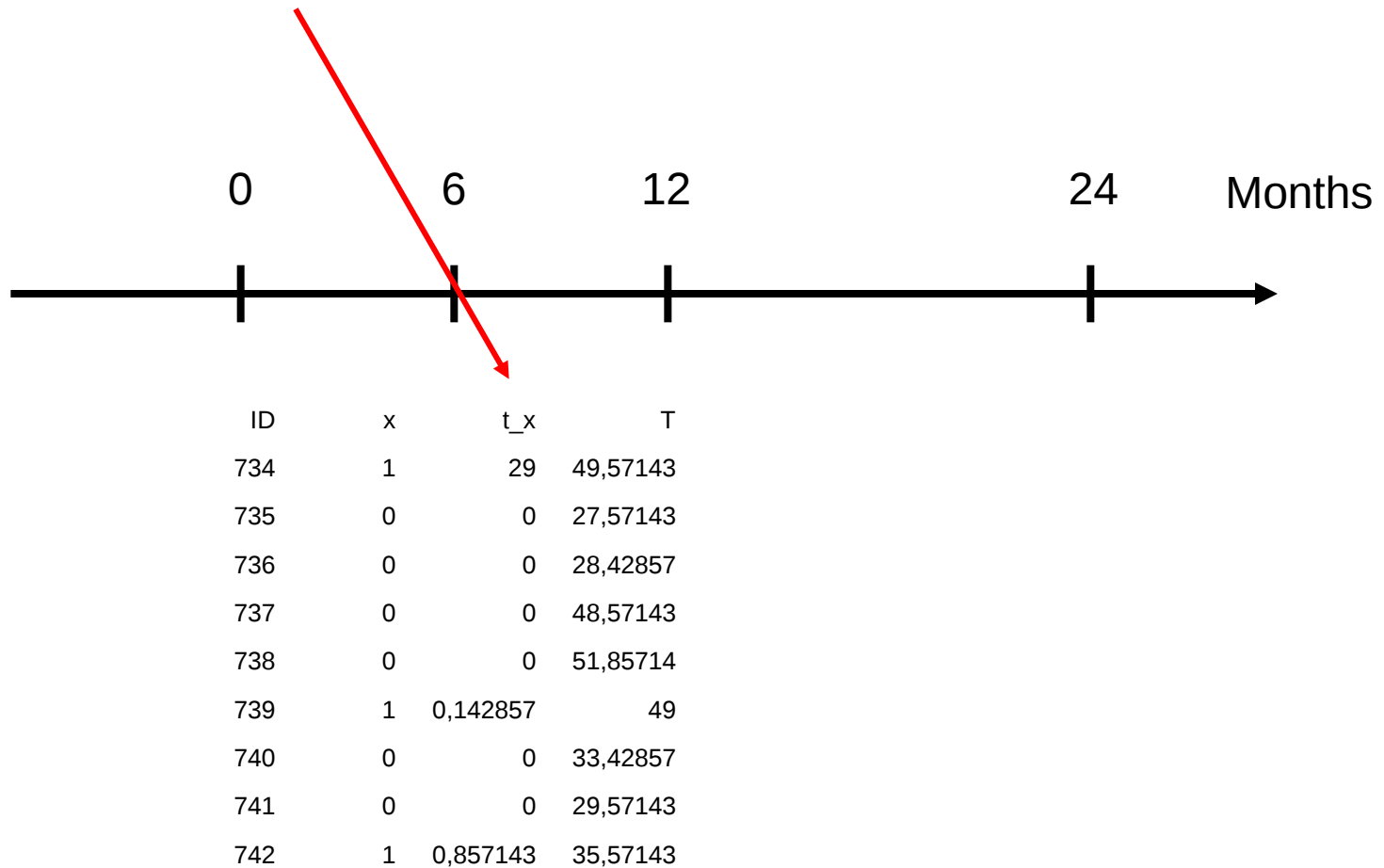
Data concerning
1500 new air
freight customers
during 2001.

ID	x	t_x	T
734	1	29	49,57143
735	0	0	27,57143
736	0	0	28,42857
737	0	0	48,57143
738	0	0	51,85714
739	1	0,142857	49
740	0	0	33,42857
741	0	0	29,57143
742	1	0,857143	35,57143

Prediction model for buying behaviour

Input data for the model:

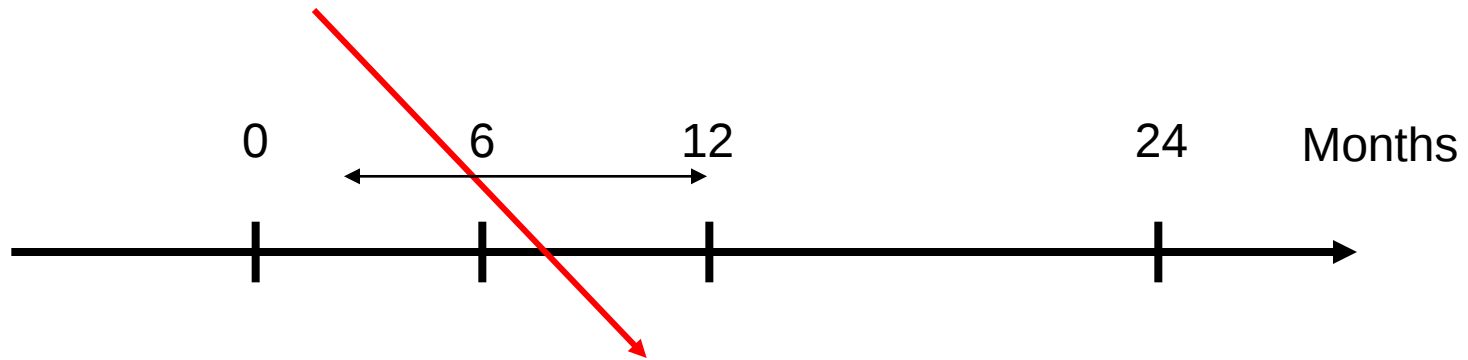
- Number of additional sales during first 12 months.
- Time for last transaction



Prediction model for buying behaviour

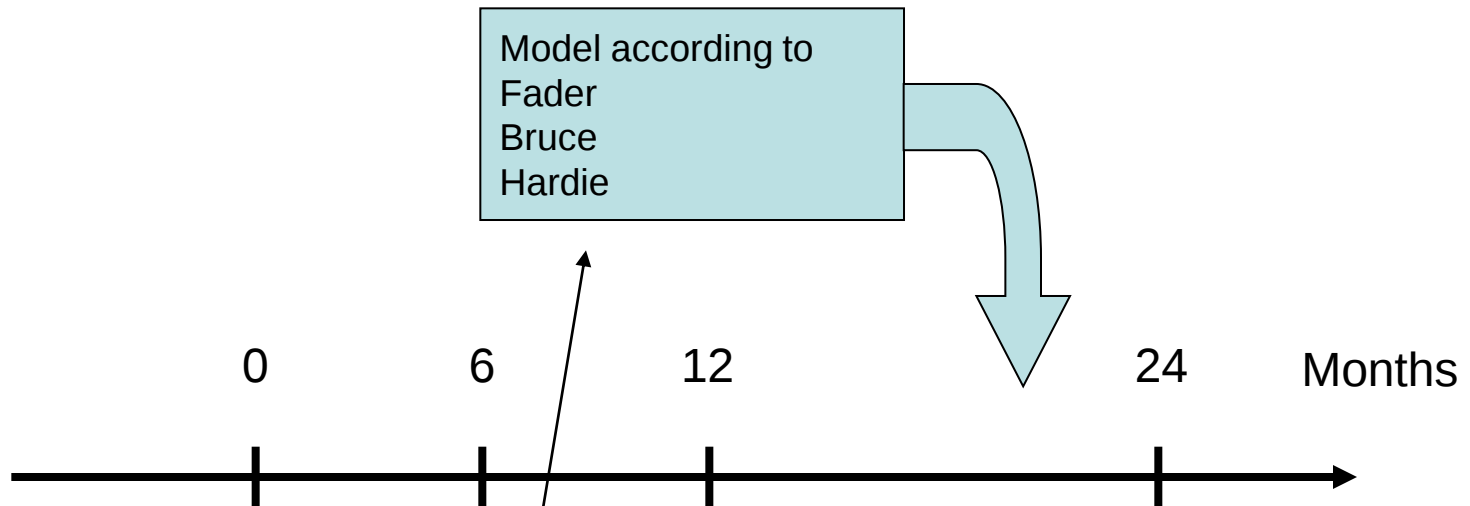
Input data for the model:

- Number of additional sales during first 12 months.
- Time for last transaction
- Length of customer relationship



ID	x	t_x	T
734	1	29	49,57143
735	0	0	27,57143
736	0	0	28,42857
737	0	0	48,57143
738	0	0	51,85714
739	1	0,142857	49
740	0	0	33,42857
741	0	0	29,57143
742	1	0,857143	35,57143

Prediction model for buying behaviour

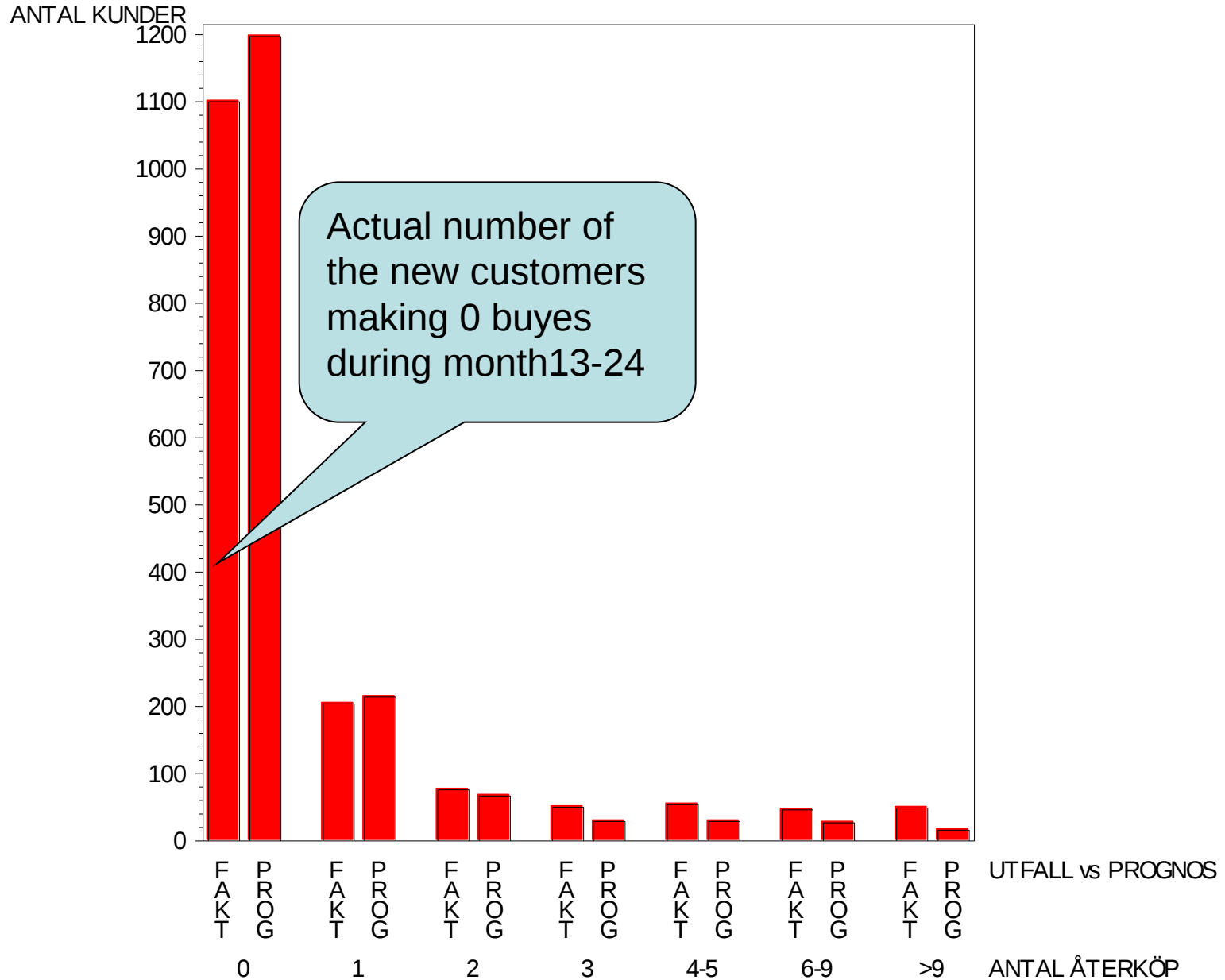


ID	x	t_x	T
734	1	29	49,57143
735	0	0	27,57143
736	0	0	28,42857
737	0	0	48,57143
738	0	0	51,85714
739	1	0,142857	49
740	0	0	33,42857
741	0	0	29,57143
742	1	0,857143	35,57143

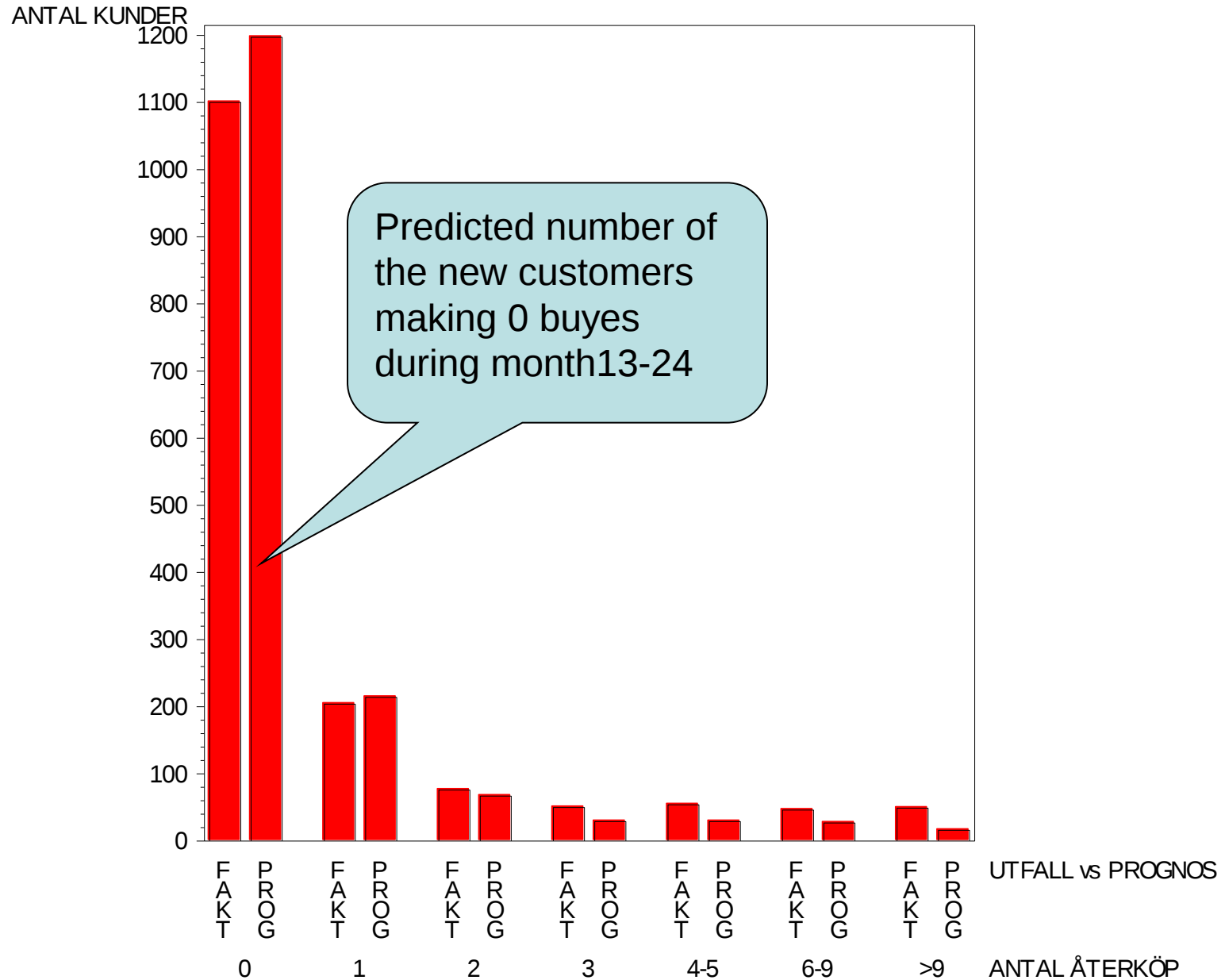
Prediction, compare

- Actual buying frequency
- Predicted buying frequency

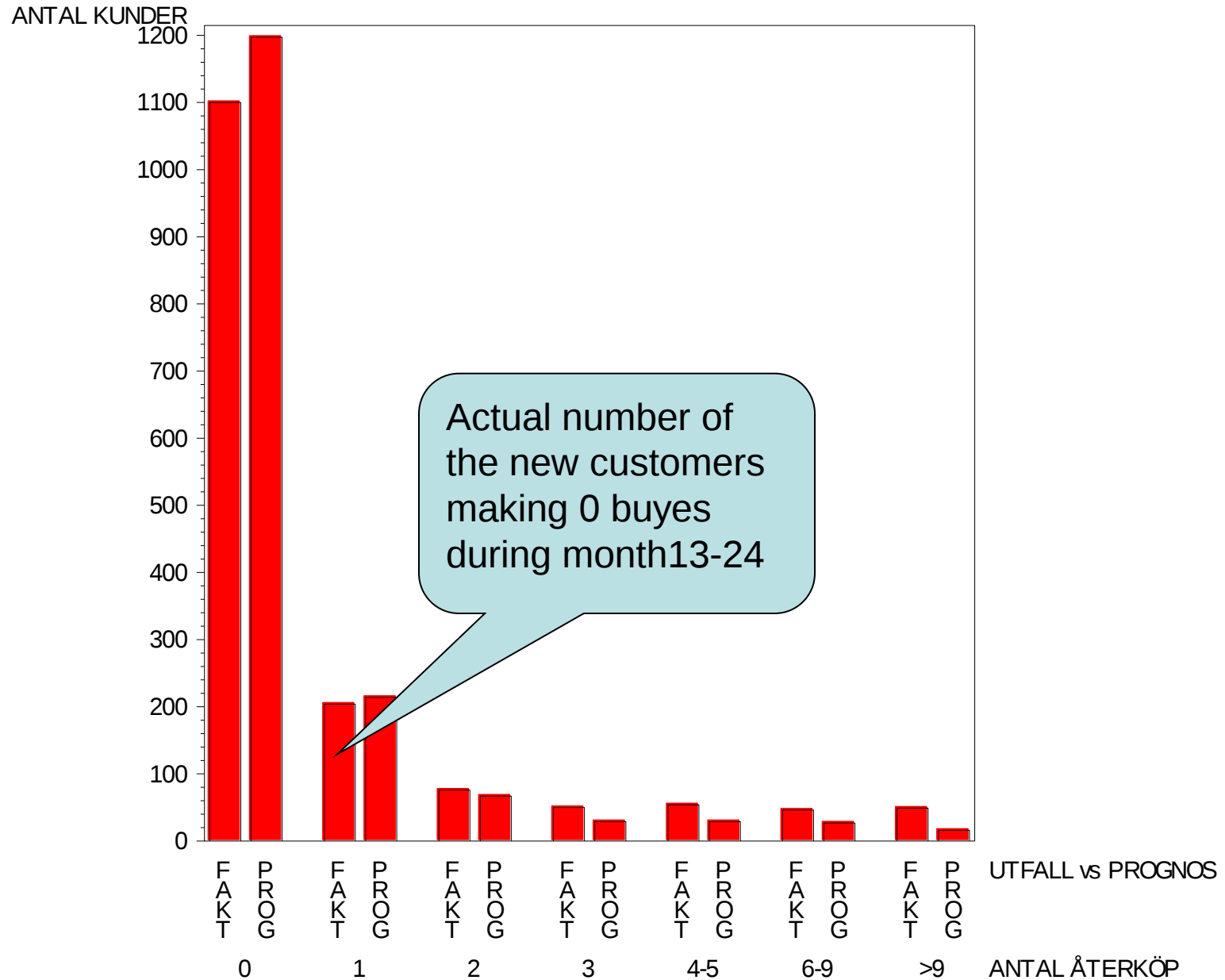
Prediction model for buying behaviour



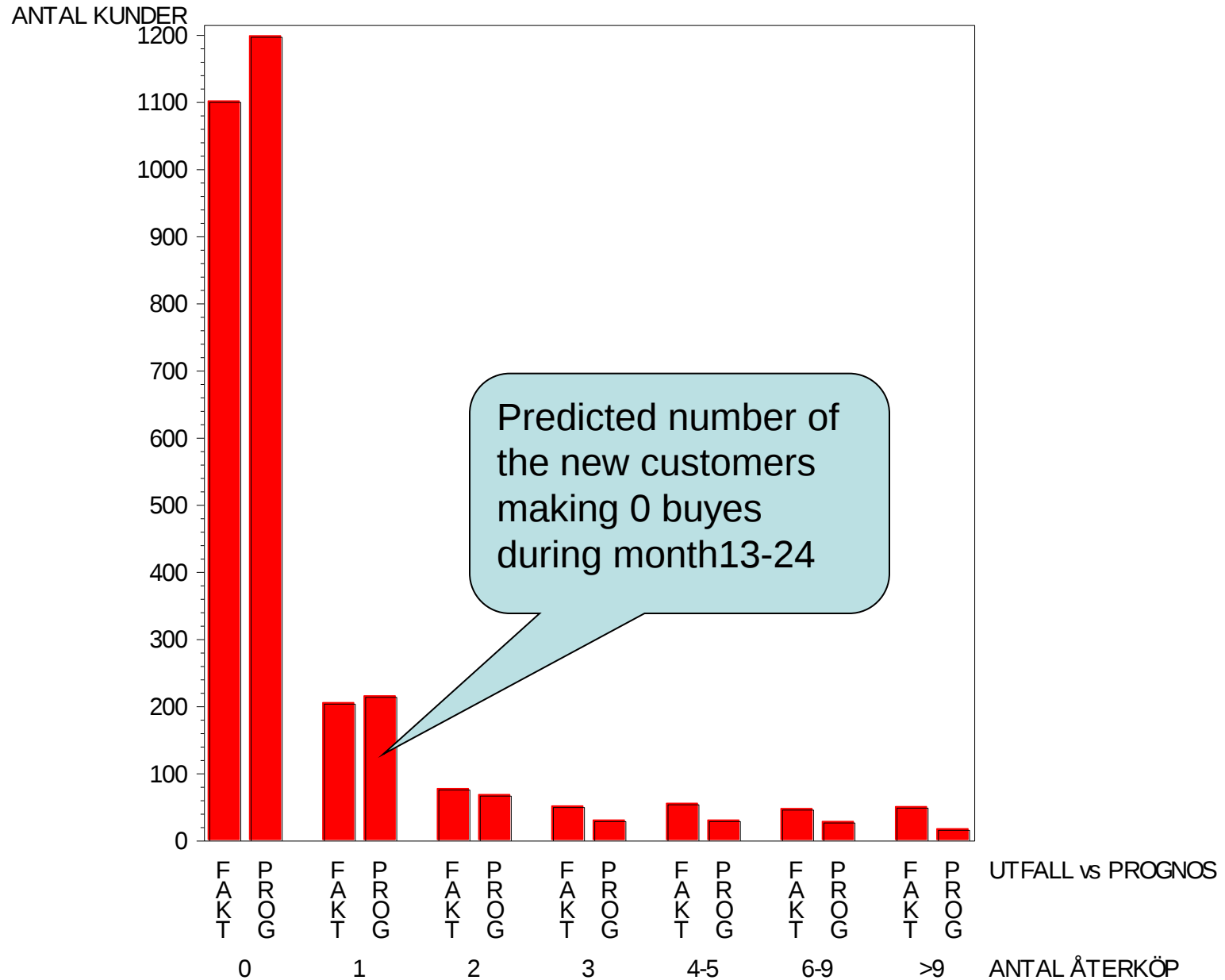
Prediction model for buying behaviour



Prediction model for buying behaviour



Prediction model for buying behaviour



Prediction model for buying behaviour

Read more about predicting buying behaviour based on transaction data:

Fader, Peter S., Bruce G. S. Hardie, and Ka Lok Lee (2004), "Counting Your Customers the Easy Way: An Alternative to the Pareto/NBD Model", *Market Science*.

Fader, Peter S., Hardie (2001), "Forecasting Repeat Sales at CDNOW: A Case Study", *Interfaces*.

Fader, Peter S., Hardie, and Ka Lok Lee (2004), "RFM and CLV: Using Iso-Value Curves for Customer Base Analysis", *Journal of Marketing Research*.

Fader, Peter S., Hardie, and Ka Lok Lee (2004), "Implementing the BG/NBD Model for Customer Base Analysis in Excel".

Excel sheet containing the calculations:

<http://www.brucehardie.com/notes/004/>



RFM

Recency, Frequency, Money

Syfte i detta sammanhang:

Prognostisera kunders framtida köpmönster och 'livstid' genom analys av tidigare beteende.

Input till CLV-modeller för trovärdig modellering av 'customer lifetime value'.

Schmittlein, David C., Donald G. Morrison, and Richard Colombo (1987), "Counting Your Customers: Who They Are and What Will They Do Next?" *Management Science*, 33 (January), 1-24

Fader, Peter S., Bruce G. S. Hardie, and Ka Lok Lee (2004), "Counting Your Customers the Easy Way: An Alternative to the Pareto/NBD Model", *Market Science* (forthcoming)

Fader, Peter S., Bruce G. S. Hardie, and Ka Lok Lee (2004), "RFM and CLV: Using Iso-Value Curves for Customer Base Analysis" *Journal of Marketing Research*.

Reinartz, Werner J., V. Kumar (2000), "Customer Lifetime Duration: An Empirical Framework For Measurement and Explanation", INSEAD Working Paper, August 2000

CLV

Customer Lifetime Value

Syfte i detta sammanhang:

För varje enskild kund, mäta nuvärdet av vinsten räknat över kundens hela livscykel.

$$CLV_i = \sum_{t=0}^T f(\text{revenue}_{it}, \text{cost}_{it}, \text{retention rate}_{it}, \text{discount factor}_t)$$

Bauer, Hans H., Maik Hammerschmidt, and Matthias Braehler (2003), "The Customer Lifetime Value Concept and its Contribution to Corporate Valuation, *Yearbook of Marketing and Consumer Research*, Vol. 1

Rosset, S., E. Neumann, U. Eick, N. Vatnik (2002), "Customer Lifetime Value Models for Decision Support", *Data Mining and Knowledge Discovery*, 7, 321-339

Werner, Uta (2003) "Getting Real About Customer Lifetime Value", Marakon Associates

Customer Equity

Syfte i detta sammanhang:

Transformerar det operativa CLV-måttet till ett instrument för värdering på företagsnivå

Instrument för paradigmskifte: från produktfokus till marknadsfokus [dvs. från 'Brand equity' till 'Customer equity']

Blattberger, R. C., Deighton J. (1996), "Manage Marketing by Customer Equity", *Harvard Business Review*, Vol. 74

Bauer, Hans H., Maik Hammerschmidt, and Matthias Braehler (2003), "The Customer Lifetime Value Concept and its Contribution to Corporate Valuation, *Yearbook of Marketing and Consumer Research*, Vol. 1

Bell, David, John Deighton, Werner J. Reinartz, Roland T. Rust, Gordon Swartz (2002), "Seven Barriers to Customer Equity Management", *Journal of Service Research*, Vol. 5 (August)

