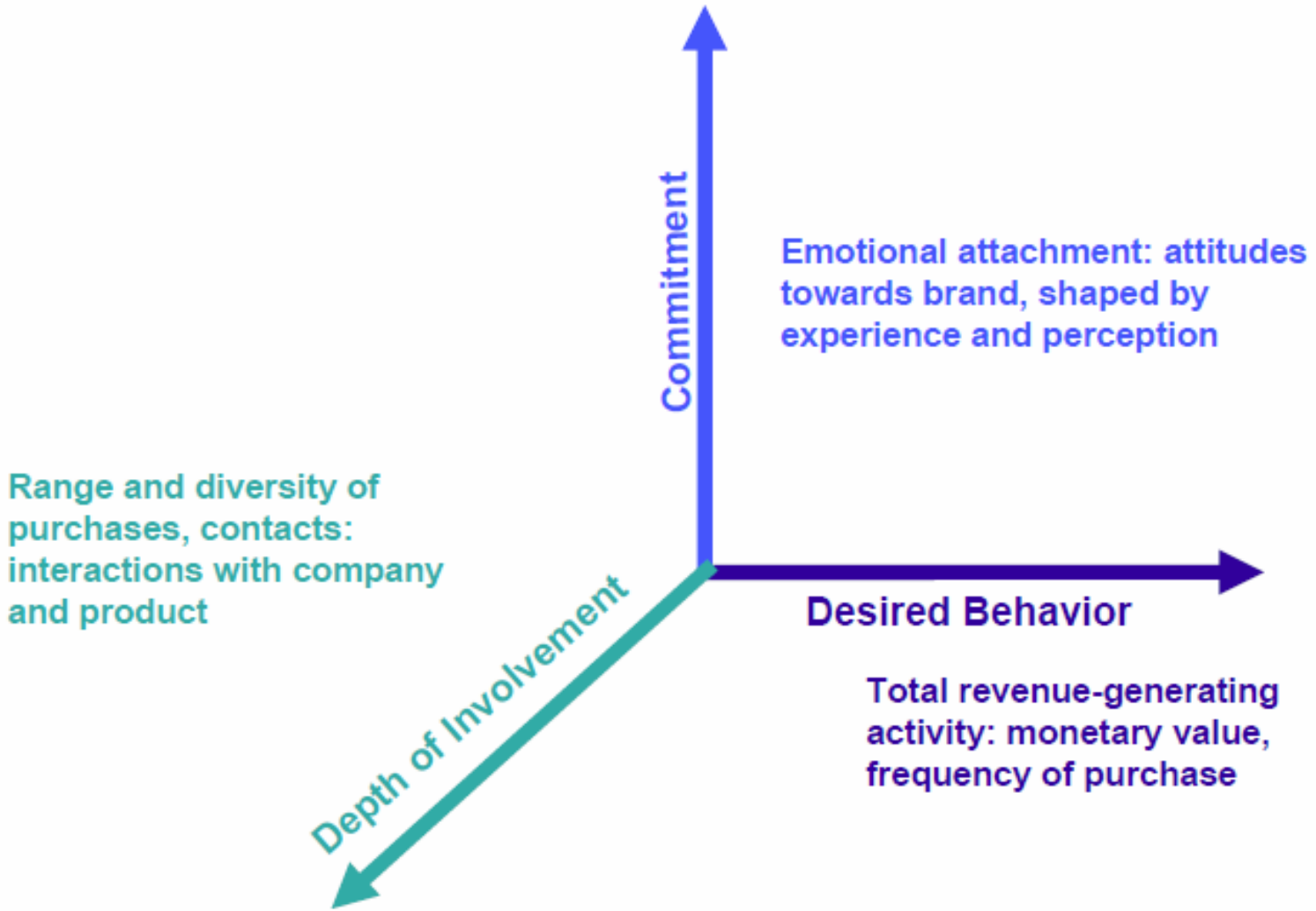
International Relationship Marketing

Control phase of Relationship Marketing

Relationships can be measured against three dimensions



Control methods for marketing

Control of Pre-Economic Impacts	Control of Economic Impacts
•Attribute measurements •Event measurements •Problem measurements With respect to: •Quality (product, service) •Perceived value •Relationship quality •Customer satisfaction •Commitment •Customer retention	Single period monitoring of effects •Customer contribution margin analysis •ABC analysis Multi period monitoring of effects: •Customer Lifetime Value •Based on payments received/disbursements made •Incorporation of customer retention probability •Incorporation of reverence value

Source: Bruhn, 2003, p. 194

Solidarity R.M Process in Practice

c- Budgeting and Scheduling

The responsibility of the marketing department is to provide:

1- SMART marketing objectives

2- Tasks to achieve those objectives

3- Estimated costs of those tasks

Solidarity R.M Process in Practice

Control and Evaluation

1- Annual plan control

2- Efficiency control

3- Strategic control

4- Auditing tools for evaluation

Customer Lifetime Value

- Introduction
  - Customer Lifetime Value Principles
  - Motivations

- Customer Lifetime Value Modeling
  - Approach
  - Models Described
    - A “Pragmatic Approach”
    - The Pareto/NBD model
  - An Example in the Retail Banking Business

- Conclusions and Summary

Customer Lifetime Value

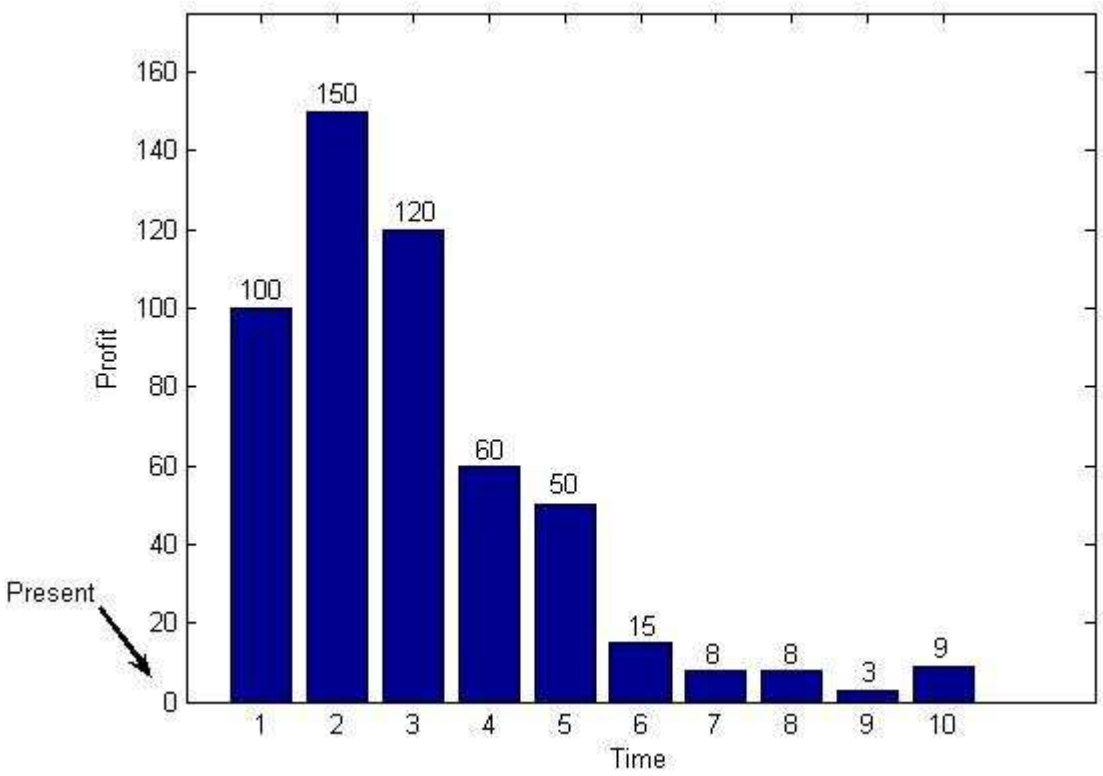
- The CLV of a customer *i* is the discounted value of the future profits yielded by this customer

$$CLV_i = \sum_{t=0}^{h} \frac{CF_{i,t}}{(1+d)^t}$$

- Where
  - $CF_{i,t}$ = net cash flow generated by the customer *i* activity at time *t*
  - h = time horizon for estimating the CLV
  - d = discount rate

- The CLV is the value added, by an individual customer, to the company

CLV: An Example



- The sum of the future profits yielded by this customer is 523
- Assuming a discount rate of 10%, the CLV at moment 0 is 398,11

Financial Motivations for the CLV

In many businesses, the profits yielded by the customers are the only earnings of the company

Gupta and colleagues have shown that the CLV of the customer base (Customer Equity) was a key driver of the stock value.

- **As a financial analyst, knowing the CLV of the customer base increase the knowledge on the focal company.**

Marketing Motivation of the CLV

By knowing the CLV of the customers, one can

- Focus on groups of customers of equal wealth
- Evaluate the budget of a marketing campaign
- Measure the efficiency of a past marketing campaign by evaluating the CLV change it incurred

Commercial Motivation for the CLV

- By knowing the CLV, someone in a branch office can
  - Focus on the most valuable customers, which deserve to be closely followed
  - Neglect the less valuable ones, to which the company should pay less attention

➢ At each decision level, to know the CLV allows to make efficient actions.

Customer Lifetime Value Modeling

How ?

An Applicable Solution

$$CLV_i = \sum_{t=0,j=1}^{h,J} \frac{CF_{i,j,t}}{(1+d)^t}$$

- Where
  - $CF_{i,j,t}$ = profit yielded by the customer *i*, due to the activity related to the product category *j*, during the time period *t*
  - h = time horizon of the prediction
  - d = discount rate
  - J = number of products the focal company sells

The Time Horizon

- Theoretically, the horizon should be infinite. It is unmanageable in the reality
  - Long-term relationship is important
    - Take a long horizon, e.g. 10 years
  - Short-term relationship is important
    - Take a small horizon, e.g. 1 year

In the empirical application, we will use a horizon of 2 years.

The Discount Rate

- Is theoretically unknown, but one could have a reasonable approach, and choose it according the focal company policy
  - Short-term relationship is important
    - Take a high discount rate, e.g. 15% annually
  - Long-term relationship is important
    - Take a small discount rate, e.g. 5% annually
  - Neutral
    - Take the Weighted Average Cost of Capital of the focal company at the moment of prediction

The Number of Products Considered

- A multi-service (product) provider will sell several products.

- When predicting the future profits per product category separately, the following problems could arise.
  - Cross-selling: if the profits related to one product category increase for a customer, another product category could benefit of this.
  - Cannibalism: if the profits related to one product category increase for a customer, another product category could suffer of this.

In the empirical application, we will not consider a multi-product case. The customers will be considered as buying only one type of product (securities transactions).

The future profits

That is the tricky part. The future profits are harshly predictable. However, one can generally find four approaches in the literature. (topology of Gupta and colleagues 2006)

- RFM Models
  - Create “cells” or groups fo customers based on the recency, the frequency and the monetary value of their prior purchases
- Probability Models
  - Assume an underlying stochastic model (e.g. The Pareto/NBD model)
- Econometric Models
  - Typically: Hazard functions, Survival Analysis
- Persistance Models
  - Typically: Vector Autoregressive (VAR) model

In Practice ➔ A MIX

In what follows, we will present one of these approaches, the Pareto/NBD model.

A Pragmatic Approach

- The net cash flow can be replaced as

$$CLV_i = \sum_{t=0}^{h} \frac{(p_{i,t} - c_{i,t}) r_{i,t}}{(1+d)^t} - AC_i$$

where

  - $p_{i,t}$ = price paid by a consumer *i* at time *t*
  - $c_{i,t}$ = direct cost of servicing the customer at time *t*
  - $r_{i,t}$ = probability of customer *i* repeat buying or being alive at time *t*
  - AC_i = acquistion cost for the customer *i*
  - h = time horizon for estimating the CLV
  - d = discount rate

- Or, for the customers already acquired, with an infinite horizon and constant retention rates,

$$CLV_i = m_i \frac{r_i}{1+d-r_i}$$

where $m_i = p_i - c_i$ is the margin, assumed constant over time.

In the empirical application, we will take m_i as the historical average for the customer *i* and *r* constant across customers with *r* = 75%.

Customer Lifetime Value Modeling

The Pareto/NBD Based Models

Pareto/NBD: CLV Design

- With the transactions prediction approach, the CLV is designed as

$$CLV_i = \sum_{t=0}^{h} \frac{x_{i,t} \times m_{i,t}}{(1+d)^t}$$

- Where
  - $x_{i,t}$ = number of transactions yielded by customer *i* in the period *t*
  - $m_{i,t}$ = profit per transaction yielded by customer *i* in the period *t*
  - d = discount rate
  - h = time horizon of the prediction

Model for the number of transactions

- The Pareto/NBD Model (Schmittlein et al. 1987)
  - The activity time is exponentially distributed with an individual "*death rate*" for each customer
  - The "*death rate*" is gamma distributed across customers.
  - While active, each customer makes purchases over time according to an individual Poisson Process
  - This Poisson parameter (*purchasing rate*) is gamma distributed across customers
  - These two rates are independent

Model for the profitability per transaction

- The Gamma/Gamma Model (Fader et al. 2005)
  - The profitability per transaction of a customer is gamma distributed
  - The rate parameter of the above gamma distribution is gamma distributed across customers
  - The average profitability per transaction is constant over time
  - The average profitability per transaction is independent of the number of transactions

Advantages of the Pareto/NBD based approach

- Requires only four variables (RFM approach)
  - The frequency: the number of transactions in the past
  - The recency: time units since last purchase
  - The cohort: time units since first purchase
  - The monetary value: the average profit per transaction
- Does not need a splitting of the training sample
  - A regression approach needs one!
- Provides the probability of activity of a customer (survival analysis approach)

Customer Lifetime Value Modeling

A Business Case

The Dataset

- Securities transactions of the customers of ING
  - Customers: entered between January 2005 and December 2007
  - Transactions: from January 2005 until December 2009
- Data used for the estimation of the models
  - From January 2005 until December 2007
- Comparison of the CLV
  - Actual: out-of-sample set from January 2008 till December 2009
  - Predicted: computed by the two models

The Assumptions Made

- The margin equals 1% of the actual transactions volume
- The discount rate is the WACC, 8.92%
- The moment of prediction is January the 1st, 2004
- The horizon is two years, that is 24 periods of one month

Measures of Comparison

- The Total Value of the Customer Base

$$TOTAL = \sum_i \hat{CLV}_i$$

- The Mean Absolute Error

$$MAE = \frac{1}{N} \sum_i^N | \hat{CLV}_i - CLV_i |$$

- The Spearman's Correlation

$$SPEAR = CORR\ (rank\ (\hat{CLV}_i), rank\ (CLV_i))$$

Results

- CLV Prediction on the Out-of-Sample Dataset

Model	**Total CLV**	**MAE**	**Correlation**
Actual Results	6 909 839	0	100%
Pragmatic Approach	6 851 268	356.11	51.03%
Pareto/NBD	5 274 288	324.01	76.33%

Conclusions

- CLV Prediction is difficult because:
  - The retention rate is unknown
  - The future margin/profit per transaction is unknown
  - The future number of transactions is unknown.

- But existing models give satisfying results:
  - The “pragmatic” approach gives very good results at the customer base level
  - The Pareto/NBD approach gives very good results at the individual customer level
  - ➔ Both are useful