

# **Argus Information and Advisory Services**

## **Best Practices in Customer Development and Relationship Management**

May 2002

## Introduction

# **The credit card industry is becoming more competitive**

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**The credit card market continues to mature. While some issuers achieve strong performance, the future is challenging. Specifically:**

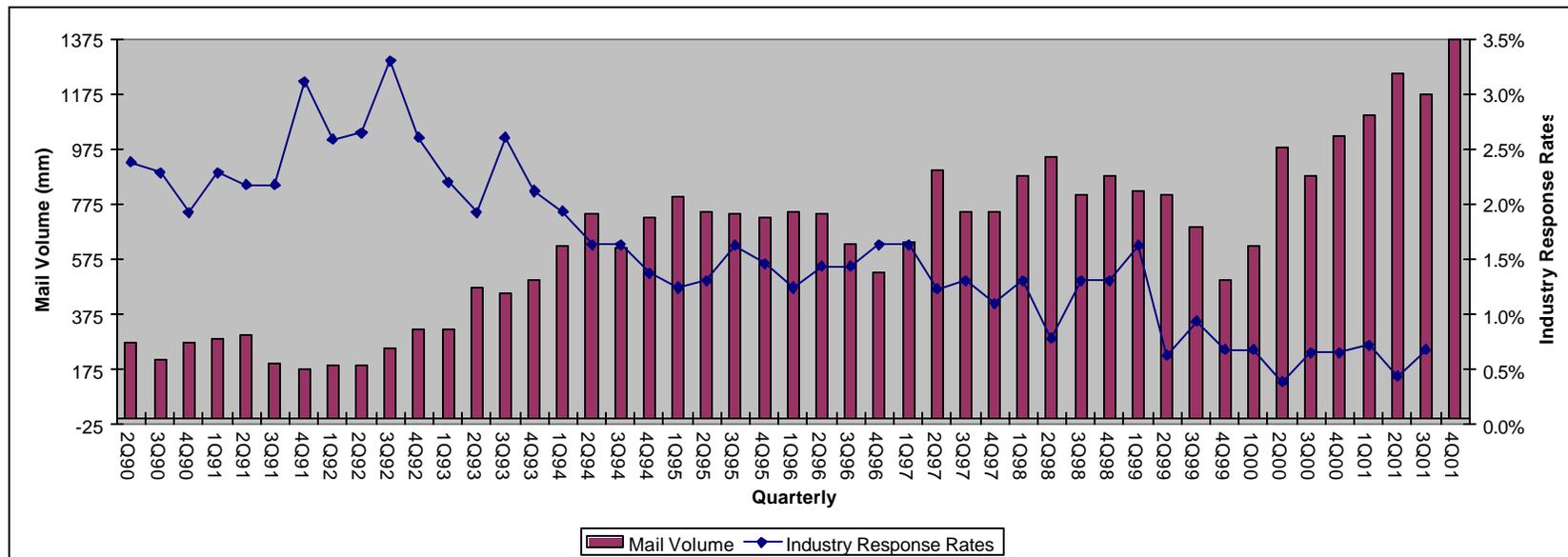
- Acquisition has proven frustrating and cannot sustain profitability
- Margins continue to compress due to price competition and credit losses
- Consolidation is occurring and purchased portfolios are trading at very high premiums
- Retaining customers is more difficult – customers are fickle and are demonstrating limited loyalty
- Issuers are unable to measure the impact and trade-offs of marketing actions, and therefore to fully realize customer value

## Introduction

# Acquisition has proven frustrating and cannot sustain profitability

Response rates are down, acquisition costs are high, untapped segments are elusive, and markets are saturated

## Industry Mail Volume



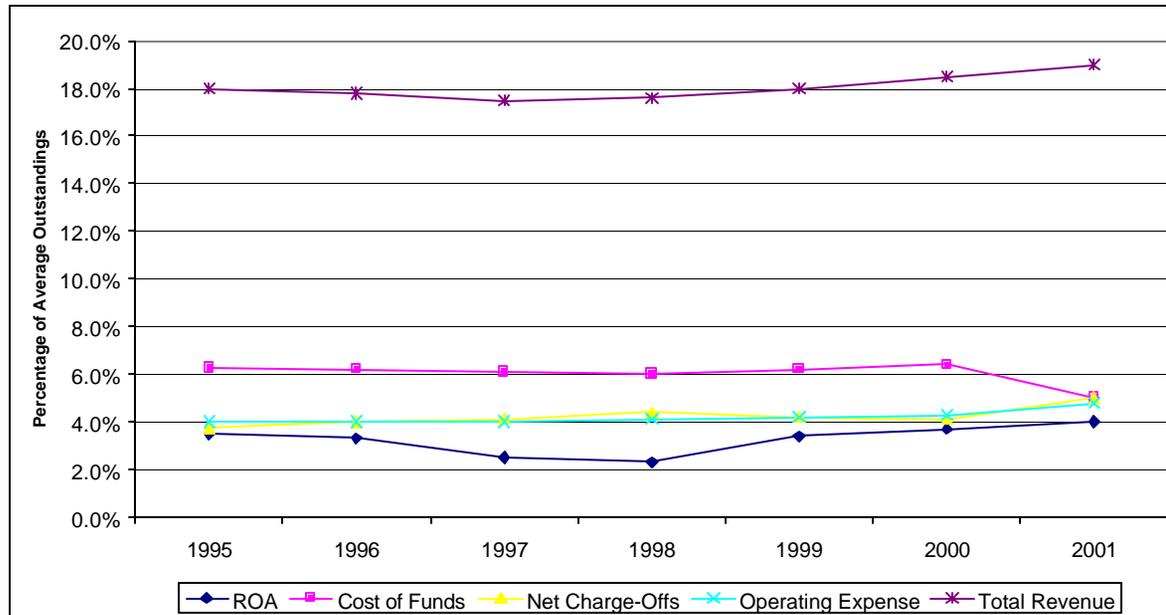
Source: Mail Monitor

Introduction

# Margins continue to compress due to price competition and credit losses

Increased interchange rates and lower cost of funds have dampened the impact recently

## Credit Card Profitability



Source: Deutsche Banc Alex. Brown

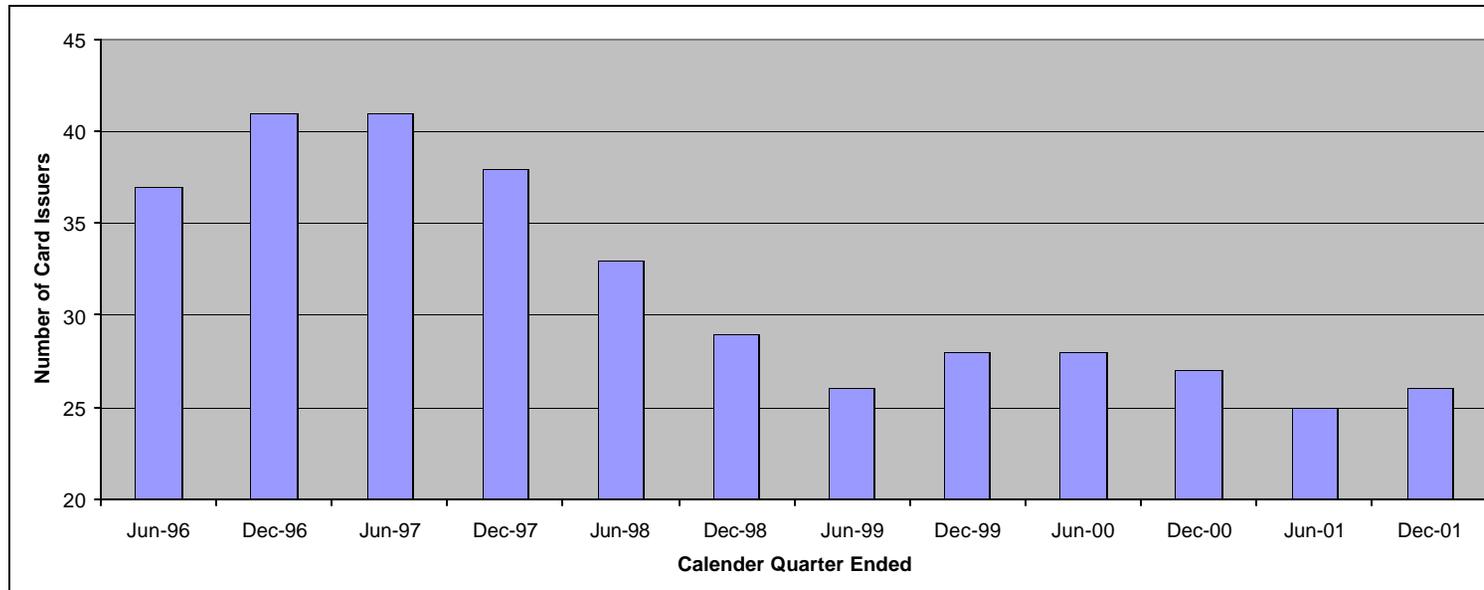
Introduction

# Consolidation is occurring and purchased portfolios are trading at very high premiums

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Majority of the growth in the industry has come through acquisitions

Issuers Fading Fast - Receivables of \$1 Billion or More



Source: Nilson

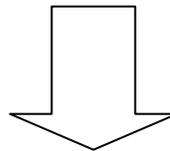
## Introduction

# The future is challenging

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In addition to the macro challenges discussed above, issuers are faced with fundamental micro level challenges:

- Retaining customers is more difficult – customers are fickle and are demonstrating limited loyalty
- Issuers are unable to measure the impact and trade-offs of marketing actions, and therefore to fully realize customer value



**To counter these trends, issuers are shifting from mass customer management to targeted and account-level customer management to maximize customer value.**

## Introduction

# **In order to succeed, issuers will need to address customer development and relationship management challenges**

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**Shifting to account-level customer management can be challenging for credit card issuers. Many of these challenges include:**

- Prioritizing customers (i.e., which customers are the most important to current financial performance and have the greatest future value?)
- Defining objectives for each customer and aligning marketing programs and tactics to achieve the objectives (i.e., program coordination and sequencing)
- Balancing short-term and long-term account objectives to maximize value
- Establishing a behavioral baseline (i.e., what happens if issuer takes no new marketing actions?) of customer migration
- Clarifying and quantifying the impact of consumer behavior on portfolio performance
- Effectively executing account-level strategy

## Introduction

# **Current customer management models have proven insufficient at addressing these challenges**

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**Current customer management models insufficiently address credit card industry trends, as well as customer management challenges. Typically, these customer management models being deployed:**

- Focus on integrating revenue, attrition and risk models (scorecards) to estimate future value, resulting in additive error (some times exponentially additive) and basic instability
- Flatten or ignore the chicken/egg relationships between marketing actions (e.g., pricing) and behavior (e.g., attrition)
- Fail to characterize short- and long-term trade-offs
- Inactionable, inaccurate, confusing and misleading

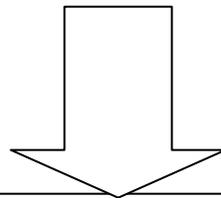
## Introduction

# **An effective customer management model must meet several requirements**

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**Credit card issuers need a tool and framework that enable them to build their marketing strategies at the individual customer level. A successful customer management model:**

- Learns
- Leverages proprietary data
- Forecasts value
- Enables trade-offs (across time periods and marketing actions)
- Sequences offers
- Supports decisions in sequenced format (e.g., price increase with line decrease)
- Integrates Marketing, Risk and Finance functions



**Argus' Lifetime Value (LTV) tool and framework address customer management challenges and meet the above requirements for success.**

## Introduction

# **Argus' LTV is a holistic customer management tool**

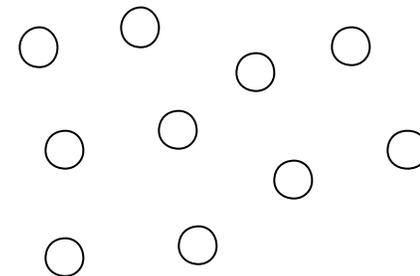
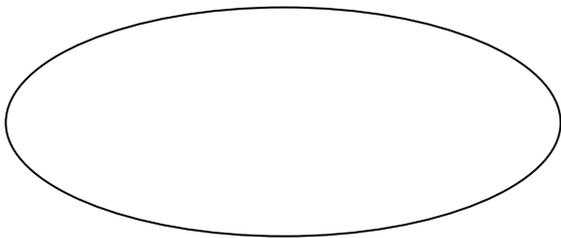
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The LTV framework leverages historical behavior and profitability to deliver forward-looking, account-level profitability and behavioral projections. Specifically, LTV provides the foundation to migrate from ...

**Campaign Management**

to

**Customer Management**



The LTV tool provides a credit card issuer with a framework that:

- A. Is unique
- B. Is actionable
- C. Has high-impact

# LTV Methodology

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## Argus' LTV methodology relies on four key steps...

1. Establish behavioral segments that group customers together that engage in similar behavior and provide similar current period profit to the bank
2. Characterize the degree of belonging of each individual customer to the behavioral segments
3. Characterize the behavior migration of customers over time and given different issuer actions
4. Quantify the financial implications of the behavior and the migration

# **1. Developing segments of consumers with similar behavior and profitability characteristics is challenging**

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**LTV first translates consumer behavior into P&L terms. By translating behavior into P&L terms, LTV characterizes the relative impact of a particular behavior on profitability.**

<b>Customer Behavior</b>	<b>Account Level Detail</b>	<b>Customer Level P&amp;L</b>
Revolving Balance	Interest Paid	Interest Income
Purchase Volume	APR	Interchange
Fees Paid and Waived	Purchase Volume	Annual Fees
Ancillary Services Purchased	Interchange	Fee Waivers
Seek / Use Credit Line	Fees Paid and Waived	Ancillary Revenue
Use Customer Service	ADB	Equity Credit
Expose the Bank to Risk	FICO Score	
Earn / Redeem Rewards	Age of Account	Cost of Funds
		Credit Costs
		Product Costs
		Origination Expense
		Customer Service Costs
		Collections Costs
		Loan Loss Provision
		Rewards Costs
		Other Expenses
		Taxes
		Capital Charge
		NIACC

# 1. Establish behavioral segments

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By translating behavior into P&L terms, we can characterize the relative impact of a particular behavior on profitability

Behavioral segments are defined by account-level P&L and behavior elements (Adaptive Vector Quantization – MacQueen, 1967)

*Illustrative*

Group	Behavioral Segment	Purchase Volume	Revolving Balance	Risk-Adjusted Cash Flow	Bureau Risk Score
Heavy Revolver	Very Heavy Revolver	\$308	\$7,457	\$325	714
Moderate Revolver	Moderate Revolver	\$282	\$3,896	\$182	718
Light Revolver	Light / Moderate Revolver	\$207	\$1,940	\$93	705
	Light Revolver	\$135	\$925	\$33	688
Transactor	Heavy Transactor	\$951	\$198	\$16	769
	Light / Moderate Transactor	\$82	\$110	(\$12)	749
Credit Challenged	Light / Moderate Revolver	\$125	\$2,349	(\$2)	608
	Moderate Revolver	\$164	\$4,340	(\$43)	607
	Heavy Revolver	\$204	\$8,028	(\$97)	604
Dormant	Dormant	\$0	\$0	(\$22)	752

## 2. Characterize the degree of belongingness to behavioral segments

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We characterize the degree to which an account “fits” into each segment (Fuzzy Vector – Klir, 1988)

Behavioral Segment	Membership Vector
Very Heavy Revolver	65%
Moderate Revolver	11%
Light / Moderate Revolver	4%
Light Revolver	2%
Heavy Transactor	1%
Light / Moderate Transactor	2%
Credit Challenged Light / Moderate Revolver	1%
Credit Challenged Moderate Revolver	4%
Credit Challenged Heavy Revolver	10%
Dormant	0%

### 3. Characterize the behavior migration of customers

By creating Markov, or stochastic, transition matrices we can calculate the probability of behavior migration patterns from one period (e.g. quarter) to the next

An example of a “transition matrix” is illustrated below:

Transition Matrix												
Current Period	Next Period											
	VHR	MR	LMR	LR	HT	L/MT	CC LMR	CC MR	CC HR	Dorm	Closed	C/O
VHR	60%	12%	6%	0%	1%	4%	0%	2%	7%	2%	5%	1%
MR	7%	50%	15%	1%	1%	9%	2%	2%	0%	4%	5%	2%
LMR	2%	9%	40%	2%	3%	24%	1%	0%	0%	10%	4%	3%
LR	0%	3%	10%	34%	2%	23%	6%	2%	1%	10%	6%	1%
HT	4%	7%	16%	2%	29%	30%	1%	0%	0%	7%	3%	1%
L/MT	0%	1%	4%	1%	5%	53%	0%	0%	0%	29%	5%	2%
CC LMR	1%	11%	10%	9%	1%	7%	42%	8%	3%	3%	1%	5%
CC MR	4%	13%	2%	3%	0%	3%	9%	49%	6%	1%	1%	8%
CC HR	15%	2%	1%	1%	1%	1%	2%	5%	63%	0%	0%	8%
Dorm	0%	0%	1%	0%	2%	8%	0%	0%	0%	80%	7%	1%

### **3. Characterize the behavior migration of customers**

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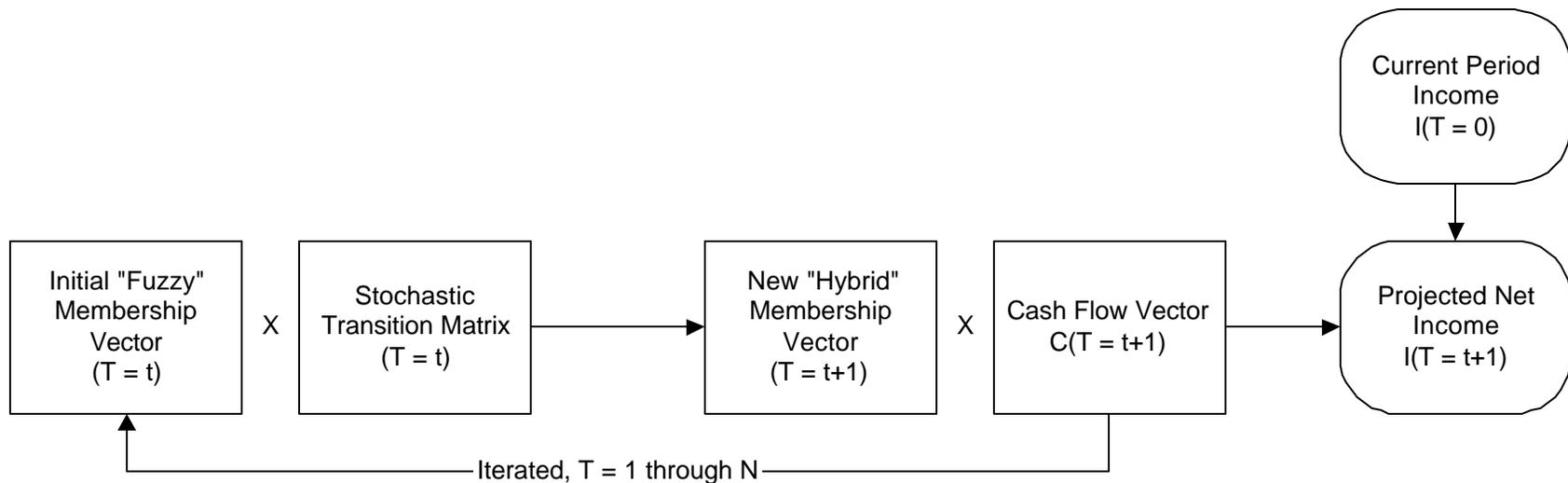
**By using transition matrices, we capture the likelihood that an account exhibiting a particular behavior pattern will exhibit a particular behavior pattern in subsequent quarters**

**Transition matrices provide sufficient flexibility to isolate and test factors that impact the likelihood that behavior will change.**

**We create unique transition matrices for each product, age group and program and capture the probability that behavior will change in the future, as well as any impact on the cash flows associated with a change in behavior**

## 4. Quantify the financial implications

Each customer has a current period cash flow and an initial membership vector. Monte-Carlo Markovian Chain (MCMC) based simulations are used to project future behavior and cash flows



## 4. Quantify the financial implications

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Using the initial membership vector of each customer, the transition matrices, and the cash flows, we calculate a net present value for each individual account. In essence, the lifetime value of a customer is the sum of the expected NPV of each migration path multiplied

Let,,

$r$  be the discount-rate

$I_t$  be the projected income at time  $T=t$

Then,

$$NPV = I_0 + I_1 / (1 + r) + I_2 / (1 + r^2) + \dots + I_N / (1 + r^N)$$

**Tested Benefits and Impact of LTV**

# **LTV is a unique, actionable and high-impact customer management tool**

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**By using LTV, issuers have uncovered valuable account-level information resulting in real-time performance improvement. LTV enables an issuer to:**

- Use customized behavioral, profitability and pricing data
- Rank order and prioritize customers
- Project and optimize future account-level profitability
- Determine account value, as well as short- and long-term trade-offs, under various marketing scenarios
- Promote campaign coordination and sequencing

Tested Benefits and Impact of LTV

# LTV provides a robust estimate and rank ordering of actual NPV and key P&L components

12 month pure forecast based on one-year historic performance of a sample portfolio within a bank:

Twentile	Score Range	NPV			P&L Elements (average)					
		Average	Cumulative Average	Total	Interest	Interchange	Fees	Cost of Funds	LLP	Other Expense
1	159 - 356	\$245.32	\$245.32	\$8,675,738	\$782.47	\$9.22	\$74.40	\$193.27	\$215.52	\$43.96
2	114 - 158	\$144.34	\$194.83	\$5,104,623	\$539.00	\$11.02	\$69.15	\$144.81	\$190.32	\$44.55
3	87 - 113	\$106.37	\$165.34	\$3,761,645	\$418.58	\$12.52	\$63.66	\$123.05	\$152.35	\$44.41
4	69 - 86	\$81.50	\$144.38	\$2,882,353	\$317.61	\$15.04	\$52.03	\$99.72	\$106.93	\$44.42
5	54 - 68	\$64.47	\$128.40	\$2,279,853	\$266.37	\$18.26	\$50.59	\$90.20	\$94.73	\$45.12
6	39 - 53	\$50.29	\$115.38	\$1,778,537	\$216.87	\$23.58	\$44.53	\$78.90	\$80.31	\$44.77
7	27 - 38	\$36.13	\$104.06	\$1,277,607	\$168.25	\$23.59	\$35.83	\$66.05	\$59.33	\$44.51
8	17 - 26	\$23.18	\$93.95	\$819,801	\$125.47	\$25.62	\$32.87	\$50.79	\$52.56	\$44.45
9	11 - 16	\$15.93	\$85.28	\$563,269	\$85.18	\$21.90	\$26.43	\$34.87	\$29.82	\$44.32
10	6 - 10	\$5.65	\$77.32	\$199,686	\$61.35	\$19.02	\$24.20	\$25.18	\$26.19	\$46.17
11	1 - 5	\$1.04	\$70.38	\$36,919	\$35.74	\$16.71	\$19.21	\$15.83	\$12.11	\$44.17
12	-3 - 0	-\$0.30	\$64.49	-\$10,570	\$22.58	\$13.61	\$12.51	\$11.34	\$7.50	\$31.81
13	-4 - 4	-\$8.14	\$58.91	-\$287,733	\$15.33	\$12.19	\$9.28	\$8.62	\$5.63	\$38.07
14	-8 - -5	-\$8.99	\$54.06	-\$318,020	\$24.82	\$12.86	\$10.78	\$12.42	\$8.96	\$44.43
15	-12 - -9	-\$11.96	\$49.65	-\$423,084	\$10.66	\$4.37	\$4.73	\$4.24	\$5.94	\$31.27
16	-13 - -13	-\$11.26	\$45.85	-\$398,054	\$7.05	\$3.79	\$3.10	\$3.53	\$4.07	\$26.47
17	-13 - -13	-\$18.25	\$42.08	-\$645,535	\$7.95	\$5.93	\$3.28	\$4.77	\$4.40	\$40.97
18	-14 - -14	-\$14.19	\$38.95	-\$501,809	\$9.44	\$5.69	\$4.11	\$5.21	\$5.38	\$34.40
19	-15 - -15	-\$8.49	\$36.45	-\$300,192	\$6.53	\$3.94	\$2.40	\$3.54	\$3.62	\$21.07
20	-20 - -16	-\$16.79	\$33.79	-\$593,866	\$9.66	\$6.16	\$3.00	\$5.28	\$5.11	\$38.92
		<b>\$33.79</b>		<b>\$23,901,169</b>						

Tested Benefits and Impact of LTV

# LTV Estimates Provide a Lift Over Other Scores

The LTV score is not only effective on its own, but it has also provided a substantial lift to other frequently used scores, such as FICO and internal behavior scores.

In the LTV Decile vs. FICO Score matrix below, the twelve-month LTV forecast is based on '99 data forecasting full-year 2000 NPV. The LTV forecast effectively characterizes future profit across accounts of all risk levels.

Lifetime-Value*		FICO																	
		1-640		640-660		660-680		680-700		700-720		720-740		740-760		760-780		780+	
Min	Max	N	NPV	N	NPV	N	NPV	N	NPV	N	NPV	N	NPV	N	NPV	N	NPV	N	NPV
\$137	\$3,008	1.0%	\$204	1.1%	\$255	1.6%	\$282	1.9%	\$297	1.7%	\$305	1.3%	\$302	0.8%	\$283	0.4%	\$275	0.1%	\$229
\$81	\$137	1.8%	\$120	1.0%	\$139	1.2%	\$132	1.4%	\$126	1.4%	\$120	1.2%	\$116	0.9%	\$109	0.6%	\$109	0.3%	\$110
\$49	\$81	1.5%	\$72	0.7%	\$78	0.9%	\$72	1.2%	\$70	1.5%	\$68	1.5%	\$65	1.3%	\$57	0.9%	\$55	0.6%	\$49
\$30	\$49	0.8%	\$44	0.4%	\$50	0.7%	\$49	1.1%	\$42	1.5%	\$42	1.7%	\$42	1.7%	\$36	1.3%	\$32	0.9%	\$26
\$13	\$30	0.7%	\$32	0.4%	\$40	0.6%	\$31	1.0%	\$31	1.3%	\$26	1.5%	\$23	1.6%	\$17	1.4%	\$12	1.4%	\$6
\$1	\$13	0.5%	\$22	0.3%	\$17	0.5%	\$17	0.8%	\$13	1.1%	\$8	1.4%	\$4	1.6%	\$0	1.6%	-\$3	2.0%	-\$6
-\$5	\$1	0.4%	\$12	0.3%	\$5	0.5%	-\$1	0.8%	-\$5	1.2%	-\$7	1.6%	-\$9	1.8%	-\$11	1.7%	-\$11	1.8%	-\$14
-\$8	-\$5	0.2%	\$1	0.2%	-\$5	0.4%	-\$4	0.6%	-\$8	0.9%	-\$8	1.2%	-\$10	2.0%	-\$13	2.3%	-\$15	2.2%	-\$15
-\$10	-\$8	0.2%	\$4	0.1%	-\$6	0.3%	-\$7	0.7%	-\$11	1.4%	-\$12	2.2%	-\$13	2.2%	-\$13	1.6%	-\$13	1.3%	-\$14
-\$2,623	-\$10	4.9%	-\$277	0.8%	-\$77	0.9%	-\$46	0.9%	-\$22	0.8%	-\$15	0.6%	-\$10	0.4%	-\$11	0.4%	-\$9	0.3%	-\$15
-\$2,623	\$3,008	11.9%	-\$62	5.2%	\$88	7.5%	\$92	10.4%	\$85	12.8%	\$67	14.1%	\$48	14.2%	\$28	12.2%	\$17	10.9%	\$3

## Key Features

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- Base line profit prediction expressed in logical and 'monetary' form
- Transparent, logical, yet unique methodology (patent pending)
- Ability to determine profit impact based upon key portfolio actions
  - Pricing change
  - Credit line change
- Ability to update simulated values at the account level
- Ability to update account-level actions based upon 'Profitability Management' Server
- Ability to sequence account-level actions to optimize profitability

Next Steps

**If you have any questions, or would like to pursue these topics further, please do not hesitate to contact us directly**

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# Who is Argus?

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- Started with the cooperation of MasterCard, services provided to 10 of the top 15 credit card issuers and over 30 leading financial institutions
- Based in White Plains, NY, extensive experience in:
  - Retail banking, with a particular focus on distribution, payments and credit cards
  - Database marketing, including design, management and implementation
  - Segmentation analysis and implementation
- Services include syndicated research, information-based tools, and advisory services