

EMPIRICAL CREDIT RISK MANAGEMENT (ECM)

MAY 2004

Empirical Credit Risk Management (ECM) is an exciting new methodology and software product developed by the banking consultancy, Finalysis Ltd, designed to *locate, measure and manage* credit risk in Instalment Finance.

Traditionally, loss forecasting in instalment finance has been more of an art and less of an exact science. Correct provisioning has, in consequence, been difficult for banks to achieve – certainly to the satisfaction of either bank auditors or Revenue.

ECM is a mathematically constructed, actuarially certified system for tracking: default and loan losses, the ages, maturities and compositions of loan portfolios and arrear movements – and then developing a macro loss forecast and provisioning requirement. In table 1, below, we illustrate the conventional approach and follow, in table 2, with the alternative *ECM approach*.

Table 1:

CONVENTIONAL AUTOMATED LOSS FORECASTING FOR INSTALMENT CREDIT RISK			
<i>Months in Arrears</i>	<i>At Risk Balances €</i>	<i>Loss Forecast Rate %</i>	<i>Loss Forecast €</i>
1	50,000	10	5,000
2	50,000	20	10,000
3	50,000	30	15,000
4	50,000	40	20,000
5	50,000	50	25,000
6	50,000	60	37,500
Total	300,000	37.5	112,500

Note: While the percentage risks attached to aged arrear categories may vary between banks, this table illustrates the normal automated approach to loss forecasting and to loan provisioning.

The ECM Approach

In the following, alternative **ECM** approach, the variability of risk over time is recognised, also the presence of risk in *non delinquent* accounts.

Table 2

ALTERNATIVE DYNAMIC ECM LOSS FORECASTING

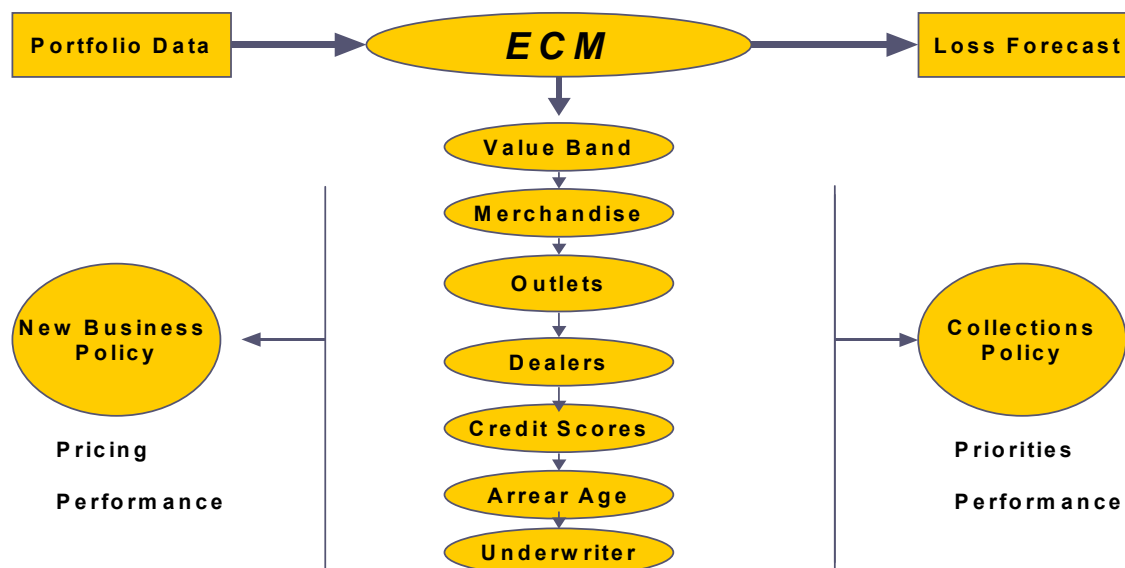
<i>Months in Arrears</i>	<i>At Risk Balances €</i>	<i>Jan %</i>	<i>Feb %</i>	<i>Mar %</i>	<i>Apr %</i>
0	10,000,000	0.9	0.8	0.8	0.8
1	50,000	7.5	6.5	6.0	5.0
2	50,000	15.0	13.0	14.0	12.0
3	50,000	27.0	25.0	24.0	22.0
4	50,000	35.0	34.0	36.0	38.0
5	50,000	49.0	50.0	51.0	52.5
6	50,000	61.0	62.0	64.0	65.0
Total	10,300,000	1.8	1.8	1.8	1.8

Note: In this illustration, the changes in the *Value at Risk* percentages reflect the experiences of the lending institution, varying over time and between seasons. The loss probability is measured also for the *Up To Date* accounts.

1. Subsidiary Level Risk Analysis

The first requirement for correct *subsidiary* analysis has to be correct calculation at the *Macro* level, as ECM does. Using data mining techniques, and *characteristic* analysis, this macro loss forecast is then distributed, via ‘risk coefficients’ across relevant loan characteristics – eg Dealer Sources, Merchandise Types, Credit Score Bands, Loan Maturities, etc, producing the subsidiary risk analysis also required for Basel II compliance – we illustrate.

SUBSIDIARY ANALYSIS - ECM SOFTWARE DYNAMICS



Comment: This analysis allows ECM to calculate ‘risk coefficients’ for all above loan characteristics.

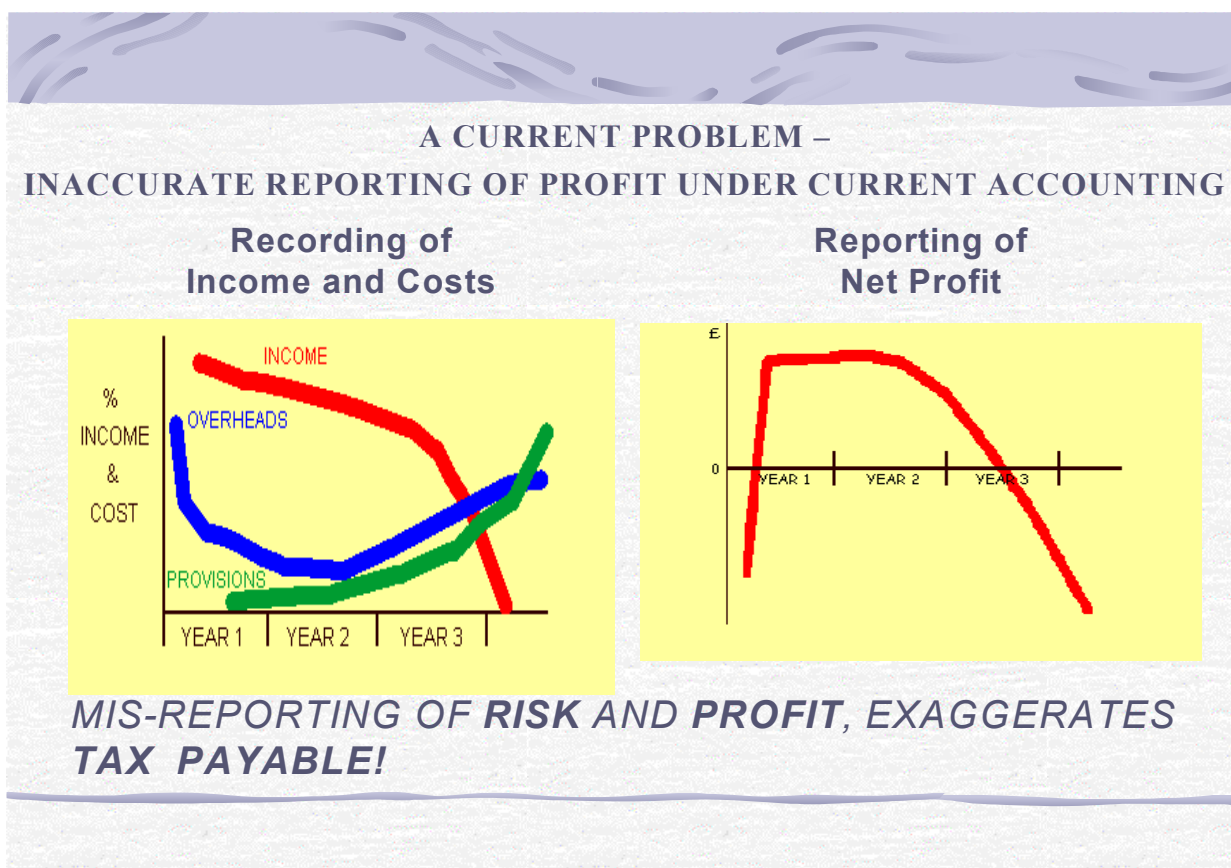
2. Finally - Loss Forecasting by Account

Further cross referencing and weighting of relevant characteristic *risk coefficients* makes it possible to distribute this subsidiary risk measurement *across the individual loans*, providing loss forecasts *and specific provisions* at the level of individual loans, again including the *non delinquent* accounts.

ECM Delivers Tax Benefits

ECM based risk calculations and specific provisions are recognised by Revenue, on the basis that they synchronise *risk* recognition with *income* recognition, as measured under the Rule of 78.

Under the traditional approach to loss forecasting and provisioning, *risk* recognition has seriously lagged the recognition of *income*, thereby creating a front-end ‘profit illusion’, also resulting in the premature payment of tax, as illustrated below.



Comment: As illustrated above, under the conventional approach to the recognition of risk, profit is heavily and erroneously credited to years 1 and 2 – ahead of the actual realisation of profit, with seriously adverse tax implications.

Below, we illustrate the potential benefit of being able, through the use of ECM, to convert former *general* provisions, into *specific* provisions.

ACCELERATION OF TAX BENEFITS FROM THE REDESIGNATION OF 'GENERAL' PROVISIONS AS SPECIFIC, USING ECM					
	Specific Provisions		General Provisions		Total
'BEFORE' <i>Conventionally</i>	€2 m	+	€8 m	=	€10 m
'AFTER' <i>Using ECM</i>	€8 m	+	€2 m	=	€10 m
PERMANENT TAX BENEFIT	€6 m (€8 m - €6 m)	@	* 12.5 % Or (in UK) 33 %	=	€0.75 m Stg £2 m

* Rate of Irish Corporation Tax.

The Current Status of ECM

ECM has achieved actuarial and academic recognition (a PhD in Risk Management for its developer). It has been validated by bank auditors and has been submitted for review by two bank regulators. The **ECM** methodology has been successfully deployed by five leading Irish banks and the software is now being installed in two banks.

Benefits available under ECM include:

- Reduced default, via an ‘early alert’ on high-risk accounts.
- Improved New Business quality, through identification of risk sources.
- Improved Collections, through the precise ranking of *at risk* balances.
- Strategic pricing opportunities for high and lower risk business.
- *Basel II* compliance, through subsidiary risk analysis.
- Substantial tax benefits, through precise identification of individual specific provisions.
- Development of League Tables and Performance Management for Dealers, Underwriters, Collection Managers, Merchandise Types etc (under ECM *Collections*, becomes a Profit Centre).

ECM Software

The **ECM** software has been designed to interface easily with most Instalment Finance databases, where static and dynamic data recorded by banks are broadly uniform. In its simplest form, **ECM** can be used simply to calculate the loss forecast and the specific provisions appropriate at any point in time (and, indeed, over time). **ECM** can, secondly, be used to develop *risk coefficients* for all loan characteristics, especially for Basel II purposes. Finally, the product may be used to develop *specific provisions* for all loans and to develop League and Performance Tables for all loan types and loan characteristics – important management information.

The **ECM** methodology and software, which have been in development for some years, carry two patents. The product is now being marketed to banks in the UK and in the US.