S.D. modelling in support of Winery Management Accounting System

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ABSTRACT

DAMAS (DAshboard MAnager System) is a large European Commission-financed research project involving four European development - consultancy organisations (HELP S.p.A. as the project co-ordinator and System Dynamics module developer, HVR Consulting Services Ltd. as System Dynamics module developer, K-Net S.A. as Business Object Architecture module developer and CEFRIEL as User Interface and task assistance module developer). and two Wineries (Casa Vinicola di Duca di Salaparuta - CORVO and John Boutari & Son S.A.) as user partners over which the project results are being experimented.

Although the project has a very larger objectives, the paper will mainly point out results obtained in using DAMAS specifically for CORVO Management Accounting area.

It will be discussed the development of the Economic and Finance model of the Wine company, through the Management Accounting area view taking in to account interactions with all main variables of other firm business areas (production, distribution, marketing etc.). The modelling approach is developed with the aim of defining a priori a number of "business tasks" from which the accounting manager can select and run the one in which he/she is mainly interested.

The model is not yet deployed and presently is under validation phase, nevertheless its development has already supplied the following results:

- *Understanding the dynamics of winery accounting area,*
- *Changing the manager's single business area view to "systemic" approach,*
- *Learning about other company business areas (production, marketing, etc.),*
- *Supporting the accounting manager in company budget definition.*

In conclusion the paper will present preliminary use of the model with some task oriented what-if analysis.

MODEL OVERVIEW

The accounting model represents the corporate company economic and financial process in order to assist medium-top manager to work out effective policies able both to keep the financial structure in equilibrium and to run efficiently corporate treasury having under control all main variables of the other organisation key business areas.
The model has the aim to study the financial dynamics of all corporate costs and revenue variables. Hence the first step of the economic and financial analysis consist

in the monetary quantification of physical quantities, derived from other business areas, giving origin to costs and revenues.

In order to achieve this goal there have been faced two problems:

1) the difficulty to share some variables because of the different models time units;
2) the difficulty to implement a consistent and up to date exchange process between different business area models.

With reference to the first one, we observed that in order to calculate for example the grapes purchasing costs , *"Monthly cost of grapes"*, from the amount of grapes, it's necessary to define an extra variable, "G*rapes delivery volume"* as monthly variables (see Figure 1):

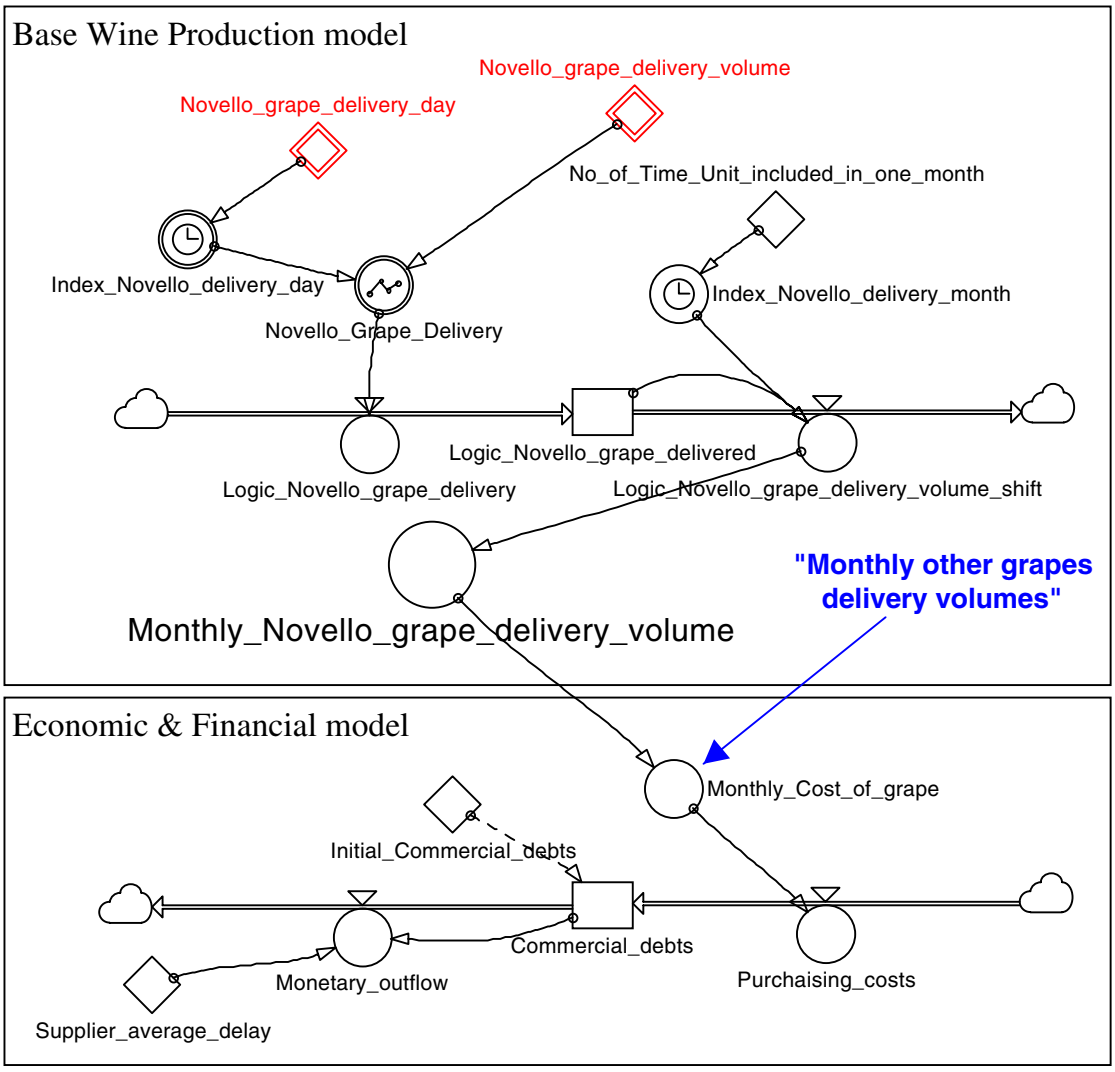


Figure 1 - Interaction between base wine production and accounting model

The second problem can be solved through the creation of a "common variable base" repository in which each specific model can place input or/and calculated common data variables and these can be accessed and used by other business area models. The

repository can be referenced each time there is the necessity of exchanging data between models (Figure 2).

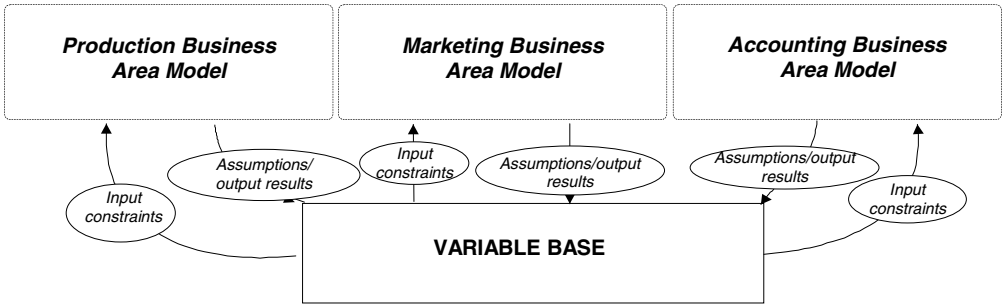


Figure 2 – The use of variable base repository to exchange consistent data between different business are models

The overall accounting model itself is divided into seven sections:

1) Credit Management;
2) Financial Sources Management;
3) Treasury Management;
4) Financial Assets Management;
5) Equipments (plants) & Depreciation;
6) Economic Results;
7) Ratios.

Figure 3 shows a general view of the overall model including the main interactions between different sections.

Now, synthetically, we will describe each section of the model.

CREDIT MANAGEMENT

The section represents the corporate commercial credit management process.
The model developed allows both the analysis of the natural maturity process of corporate commercial credits and the disinvestiment of these before their expiration, having recourse to a factoring company. The factoring organisation will discount corporate commercial credits and will pay back the net value.
The model also analyses the unpaid credit management. The difference between the inflow, deriving from the cashing of the commercial credits, and the outflow, deriving from the commercial debts payment, represents the *"Commercial cash flow"*.

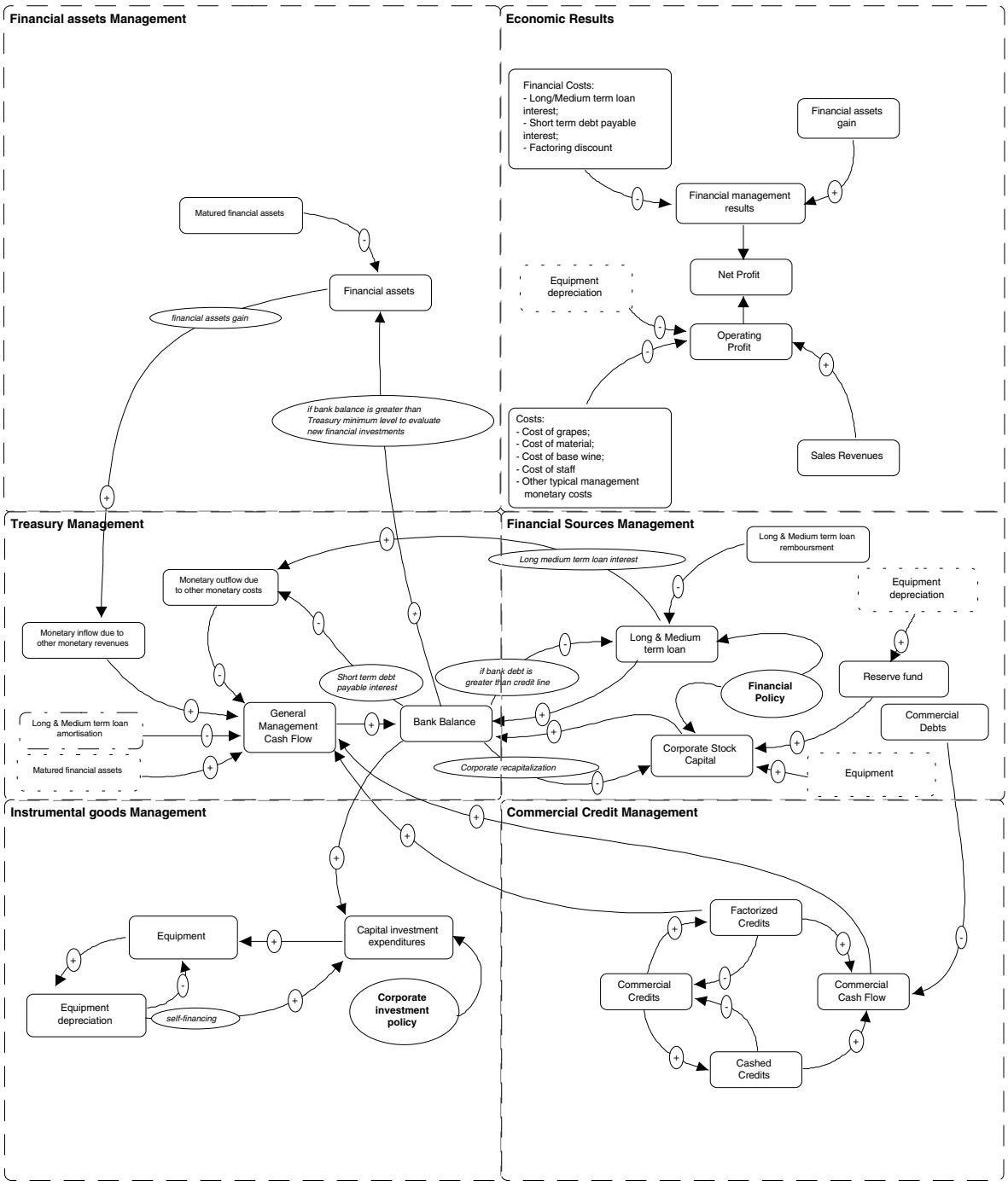


Figure 3 – Overall accounting model structure

FINANCIAL SOURCES MANAGEMENT

This section describes the financial sources management. The model analyses the following financial sources:

- own stock capital;
- debt capital:
  - *Short term debts;*
  - *Long and Medium term debts.*

If current financial requirements exceed available financial resources (short term credit line + bank balance), user will be able to face up to the financial requirements by means of three possible policies:

- increasing long/medium debts;
- increasing corporate stock capital;
- a combination of above policies.

The model also analyses the repayment process of debts, distinguishing between capital share (which reduces the debt nominal value) and interest share (calculated on the residual debt value).

TREASURY MANAGEMENT

The treasury management process section goal is to assure that corporate treasury to be as much as possible equal to the desired level one (i.e. the level at which financial requirements can be economically satisfied day by day).
In case the corporate treasury exceeds the desired level one, the surplus will be deposit to the bank, otherwise (corporate treasury less than the desired level one) the financial requirement will be satisfied by means of the bank borrowing (without exceeding the short term credit line).

FINANCIAL ASSETS MANAGEMENT

Financial assets management section describes the investment process of financial surplus in financial assets.
Indeed if monetary availability (cash + bank balance) exceeds the minimum threshold to make new financial investments (m*inimum value for financial investment*), the surplus will be invested in new financial assets in order to gain interest.
The model allows to evaluate possible financial asset disinvestiment before the maturity time, once treasury state needs financial resources.

EQUIPMENT & DEPRECIATION

The section represents both the equipment buying and selling process and the depreciation of them.
This section also determines the financial requirements deriving from new investments.

ECONOMIC RESULTS

This section shows the main mean economic results:

- Operating profit
  It calculates the economic result deriving from the typical corporate management process. It depends mainly on the difference between the total general management revenues and the total general management costs
- Net profit
  It calculates the corporate general economic result deriving both from typical corporate management process and from other management process (such as financial management). It depends on the sum of the operating profit and of the result of the financial management .

RATIOS

The ratio section shows the main economic and financial indicators. In particular the model includes the following ratios:

- Current ratio: it express the corporate solvency degree;
- Quick ratio: it express the corporate liquidity degree;
- Leverage: it express the percentage of stock capital compared to the debt capital;
- Return on Sales: it express the percentage of operating profit due to the revenue sales;
- Return on Investment (ROI): it express the rendering of the stock capital invested in the typical corporate activity;
- Return on Equity (ROE): it express the general rendering of stock capital.

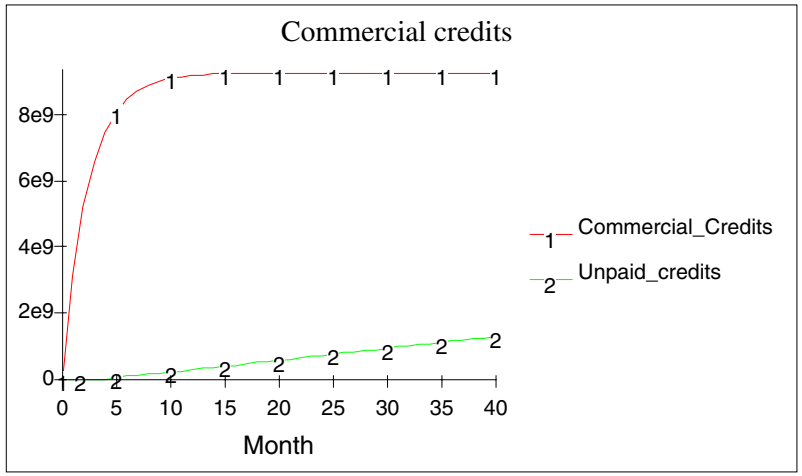
RESULTS

A typical situation which should be approached by accounting manager, with the use of model, is when for example due to unfavourable weather forecast a bad grape harvest is foresee. This presumes to deal with a decreasing sales volume for the year coming and hence one of the manager tasks is to calibrate the corporate treasury level in order to best manage the decreasing volume of incomes from wine selling.

Base condition

In Figure 4 it is presented the main economic and financial output when the model works under normal input values. Let us focus only on the input variable that will be changed in the following “what if analysis”.

- Monthly sales rate = 450.000 bottles;
- Treasury minimum level to evaluate new financial investments = 20.000.000 currency.



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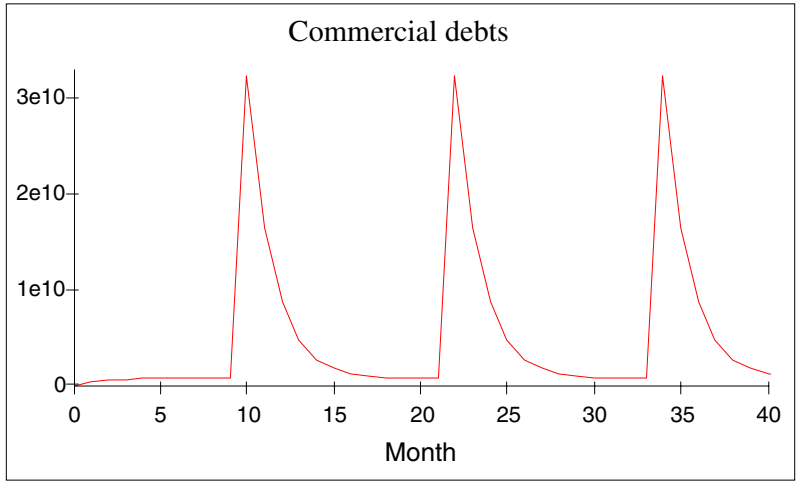

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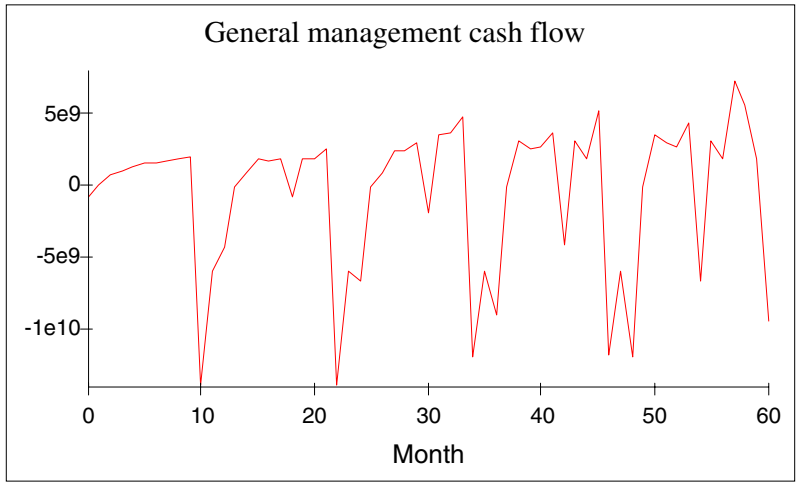

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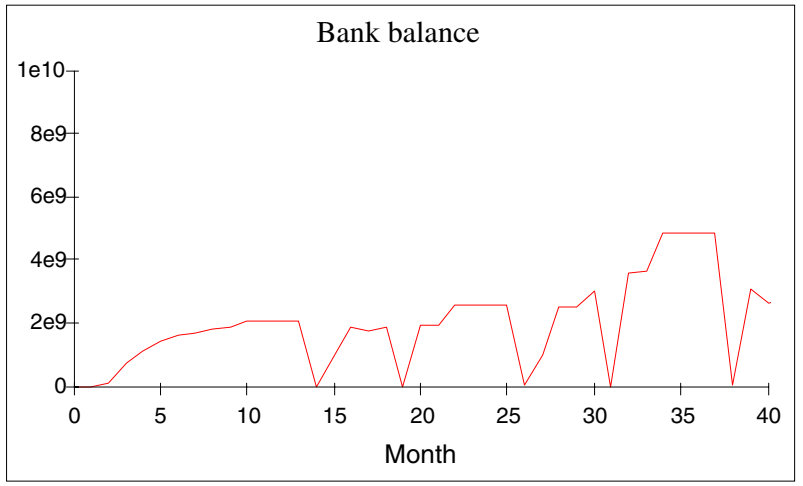

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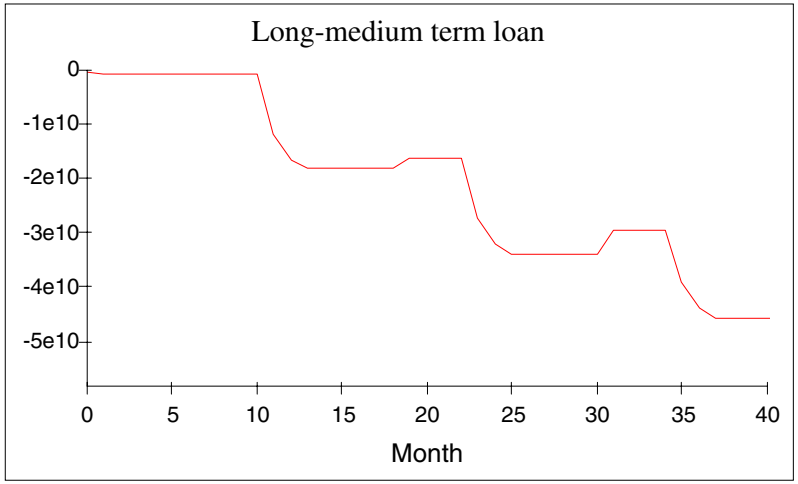
Figure 4.1 Model results under base condition



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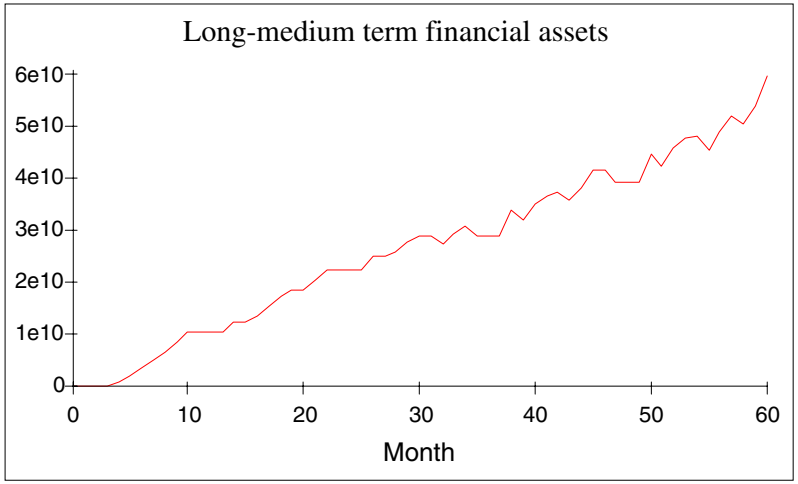

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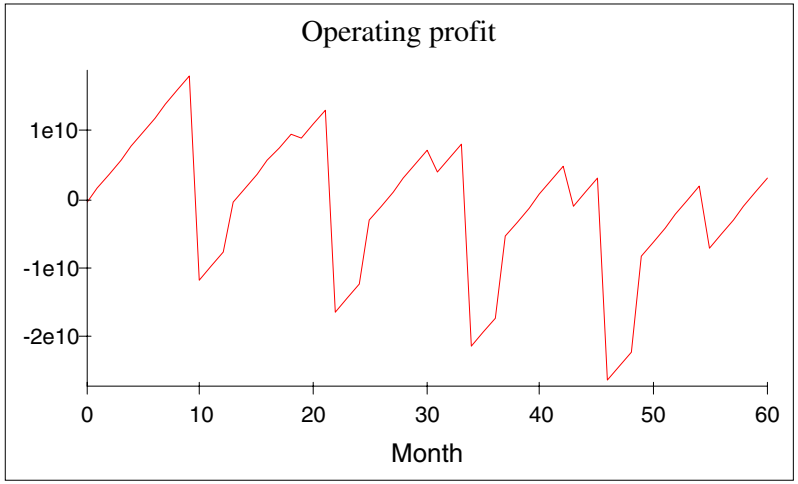

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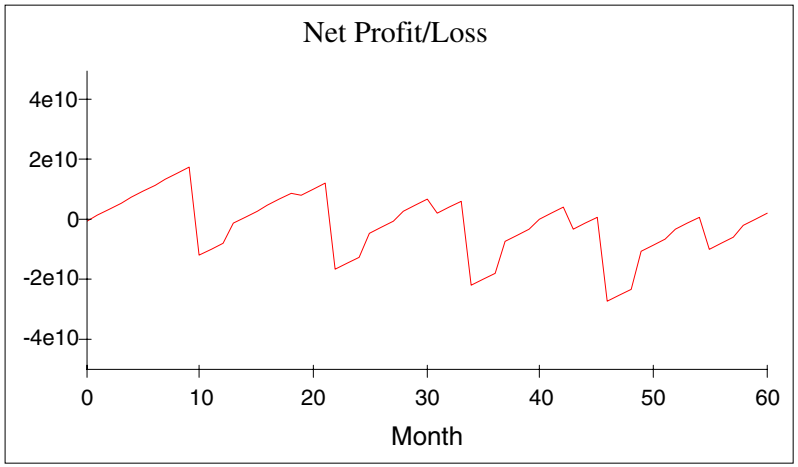

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Figure 4.2 Model results under base condition

Reduced wine volume selling condition

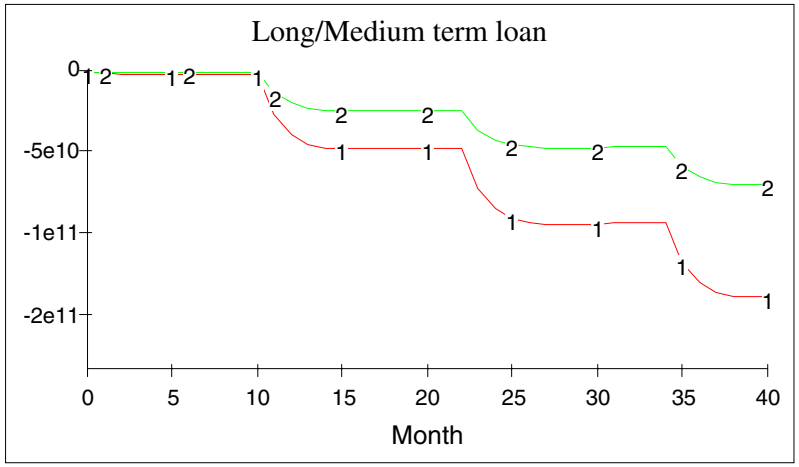
Now let us take into account a typical accounting manager decisional "task": what should be the corporate 'cash on hand' once the sales forecast is decreasing ?

- Monthly sales rate = 220.000 bottles (this sales volume isn't able to keep an economic equilibrium);
- Treasury minimum level to evaluate new financial investments:
  case 1) = 20.000.000 currency;
  case 2) = 100.000.000 currency.

In the first case the accounting manager prefer to held a little treasury level to face up to unforeseen financial requirements and to invest, as described in "Financial Assets Management" section, the monetary surplus in financial assets. In the second case, instead, the accounting manager is less inclined to risk and decides to held a higher corporate financial treasury level, missing the financial gain deriving from potential new investments.
In figure 5 the comparison of the following key variables, deriving from the two different cases above, is presented:

- Long/Medium term loan;
- Long/Medium term financial assets;
- Net profit/Loss.

In contrary to what, at first glance, one can imagine the case 2 hypothesis is preferable to case 1 because a low treasury level (case 1) aggravates the corporate economic performance. This occurs because the financial requirements due to a sales decrease, induce a growing borrowing in order to face up to daily payment, worsening the economic results.
On the other hand a higher treasury level (case 2) allows to face up to the financial requirements with company own financial resources, reducing the borrowing increase.



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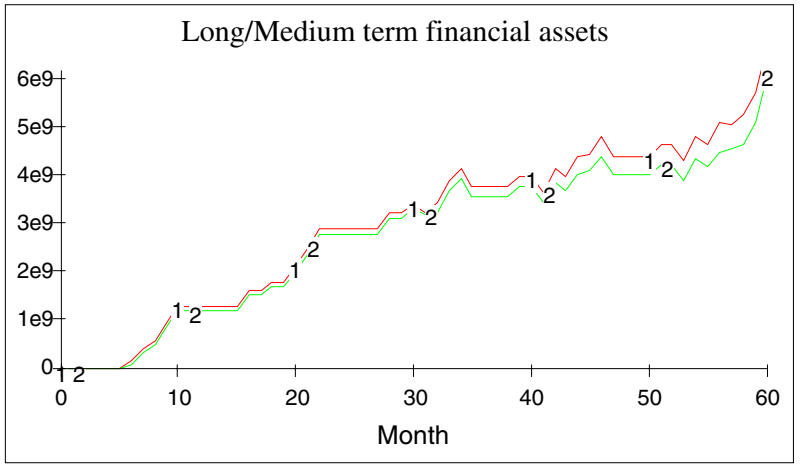

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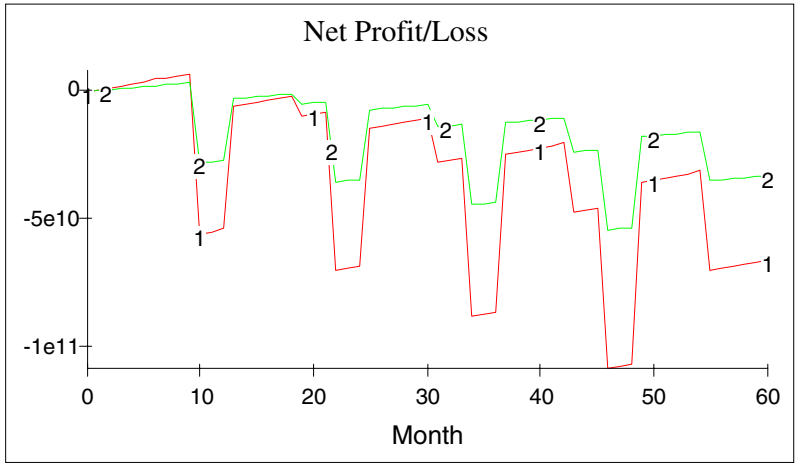

c)

Figure 5 Model results under reduced wine volume selling condition

References

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