

MATCHING COMMERCIAL WITH FINANCIAL AND EQUITY MANAGEMENT POLICIES IN SMALL ENTREPRENEURIAL FIRMS.

THE SMALL BUSINESS GROWTH MANAGEMENT FLIGHT SIMULATOR

CARMINE BIANCHI

Associate Professor of
Business Management
University of Bari and Palermo (Italy)
C.U.S.A. - System Dynamics Group
Palermo (Italy)

<http://www.unipa.it/~bianchi>
bianchi@unipa.it

ENZO BIVONA

Master Phil. in
System Dynamics Candidate
University of Bergen (Norway)
C.U.S.A. - System Dynamics
Group Palermo (Italy)

<http://www.unipa.it/~bianchi>
enzob@futuralink.it

Abstract

An Interactive Learning Environment (ILE) has been built in order to reproduce the budgeting process of a small family-owned entrepreneurial firm, to capture how current decisions impact on business growth on a longer time horizon. The ILE matches the accounting-related perspective through which spreadsheet-based budgets are drawn up, with the system dynamics view. Such a goal has been pursued through a connection of traditional Excel ® spreadsheets with Powersim™ SD models.

Playing The Small Business Growth MFS allows one to learn how:

- *to draw up a budget based on a system dynamics perspective;*
 - *long term goals may be affected by current decisions;*
 - *business/family survival and growth are strongly influenced by current policies;*
- linking short to medium-long term policies and commercial to financial and equity management issues is critical to business growth.*

1. Introduction

Very often entrepreneurs, either explicitly or implicitly, feel *growth* as a goal to be pursued through their own management decisions. Both operational (e.g. sales revenues) and structural (e.g. net assets) growth are seen as a means to let the business evolve from an early to a more advanced stage. However, growth may also reveal itself as a crisis factor; in fact, a too fast, high or unintended growth rate is often a primary cause of decline in financial and economic company performance. This paper tries to demonstrate how matching system dynamics (SD) with accounting models into computer-based, interactive learning environments (ILEs) may support entrepreneurs and other small business 'key-actors' in understanding processes originated by operational growth strategies, in order to foster analysis, diagnosis and policy making.

2. Small firms as a field of research

The subject of small business and entrepreneurship has been much discussed in the management literature. Although an analysis of different concepts of small business goes beyond the scope of this work, it is possible to distinguish two main different points of view according to which small firms have been differentiated from larger ones, i.e. the *quantitative* and *qualitative* perspective. For example, Bolton report (1971) suggests that small firms are those that have: relatively small market shares; a high degree of personalised owner-management; independence in that they do not

form part of a larger enterprise and that the owner-managers should be free from outside control in taking their principal decisions. A *qualitative* approach is adopted by those who suggest that quantitative parameters (e.g. employees, sales turnover) do not allow one to define to what extent a firm ought to be considered small or larger (Curran and Burrows, 1989; Goffee and Scase, 1980). Based on a qualitative approach, the concept of small business intended in this paper is that of a *family-owned* firm, where usually the owner-entrepreneur:

- both *co-ordinates* management operations and is involved in *current activities*;
- is not supported by *professional management*;
- involves other members of the equity-owning *family* in business operations;
- is seldom supported by *formal organisation structures* and *planning & control* systems;
- is not prone to *delegate* decision power;
- often makes *intuitive decisions*, particularly concerning on-going operations, based on experience and a “flair for business”;
- lacks of *time* available to rationalise strategies, due to his/her emotional involvement in current business management;
- has to balance both *business* and *family* requirements.

In spite of SMEs relevance to economic growth and stability, many entrepreneurs often seem not to be well supported by the wide range of business actors (e.g., banks, professional accountants and other external advisors, University researchers, etc.) with whom they currently interact. This phenomenon could be explained by a number of factors, such as lack of information, business culture and time available due to entrepreneurs’ high involvement in current activities. Regardless the causes, a recurring circumstance is entrepreneurs’ loneliness in facing difficulties hidden by small business growth (Gumpert and Boyd, 1985), which is very often a primary cause of failure.

3. Main factors of failure related to small business growth: the need of a holistic and learning-oriented approach

The scientific debate on the causes of small business failure has been fruitful, particularly in the last decade. *Financial problems* (e.g., undercapitalization, cash flow management, ability to control costs) have been indicated by some scholars (Festervand and Forrest, 1991) as the first cause of small business failure. Although financial analysis and net working capital management is considered as a very important issue by small business entrepreneurs, a significant percentage of firms do not use any of these concepts (Nix and McFetridge, 1987). A survey (Hutchinson, Ray, 1986) also showed that in a 33 firms experiencing a “supergrowth”, 18 suffered for a long period of time from a negative net working capital (Schulze and Dino, 1998; Merikas *et al*, 1993; Peel and Wilson, 1996). *Management problems* have been indicated as the second leading cause of crisis. Entrepreneurial *inexperience* and *incompetence* have been identified by several authors as a primary cause of small business crisis (Ault and Miller, 1985; Olivera and Martin, 1993). Another significant weakness has been indicated in the lack of qualified personnel and ineffective assignment of rules and tasks to family members and in the ability of entrepreneurs to adjust to the fast paced environment (Bradley, 1997). Conversely, from a survey conducted on a sample of unsuccessful small businesses, it has been remarked that it is not uncommon for entrepreneurs to blame external factors for their failure rather than themselves. (Lussier and Corman, 1995, p.5). In fact, *undercapitalization*, *recession* and *creditor problems* have been indicated by the interviewed entrepreneurs

as the major causes for their failure, while *poor management*, *lack of planning*, *recordkeeping* and *financial control* are not adequately taken into account (O'Neil and Duker, 1986). Some other scholars (Moran, 1997; Aitchison, *et al*, 1994;) have been focusing their research on small business entrepreneurs personal characteristics in order to find some relationships with possible constraints to pursuit of the firm's growth. However, from the above mentioned literature what does not emerge is another important factor of small business failure, related to low entrepreneurial *awareness of the relevant business system structure*. In fact, quite often the relevant business system does not coincide with the internal boundaries of the firm. It also embodies a wider range of variables belonging to other external sub-systems, related to the competitive, social and equity-owning family environment. Such a misperception often leads small business entrepreneurs to take their decisions according to a bounded point of view, both in terms of time horizon and causal relationships between internal and external relevant variables. Entrepreneurs need not only to acquire managerial concepts, technical capabilities, or qualified professional management; they also, and particularly, need *to learn* (Cressy, 1996). Learning may allow entrepreneurs to understand and manage business complexity, whose characteristics are peculiar in the small firms context.

4. Managing small business growth in complex and unpredictable systems: implications for strategic control

Complexity and unpredictability usually have a specific and different shape in small firms than in bigger ones. Figure 1 depicts three main interrelated complexity factors which often lead to small business failure, i.e.: a) *internal*; b) *external* and *family-related* factors ¹. *Internal factors* are those which are related to variables located inside the firm. Among them, the most influential may concern: entrepreneurial managerial attitudes, “debts/equity” ratio, planning & control methodologies and tools, human resources, innovation management. *External factors* are mainly related to competitors, customers, financial institutions and other actors which interact with the firm from the outside. Perceptions about external factors are a key linking mechanism between internal and external factors. Lack of understanding industry “rules of the game” and difficulty to provide financial or human resources to sustain growth are among main external factors of small business failure. *Family-related factors* refer to the overlap (Landsberg, 1983) between the firm and equity-owning family. Such overlap often leads to two problems: 1) bias in profit and cash flows expectations leading to uncontrolled liquidity withdrawals from company bank accounts to satisfy family needs; 2) uncertainty in the definition of roles played by family members into the firm.

Owing to their particular tendency to be subject to environmental unpredictability, much more than bigger firms, in small businesses the *boundary between ‘short’ and ‘long’ term* is usually particularly blurred. Small business entrepreneurs are almost always completely involved in current activities for three main reasons: 1) usually they are not prone to delegate; 2) they usually do not dispose of any prompt and selective information support which allows them to anticipate future events; and, 3) the weak relative weight of the firm in the relevant environment often forces them to adopt a reactive and emotional decision making. Managing small firms is often a matter of a continuous striving aimed at escaping from unexpected external or internal events. It is a kind of *muddling through* (Limbloom, 1959) which very often does not

¹ It is worth remarking that such a schema does not pretend to drastically split three aspects this issue, as they are inter-related. We only want to depict a systematic picture of the investigated phenomena.

allow a formal or conscious definition and planning of strategies to be pursued. From these considerations the conclusion does not emerge, however, that small firms do not have any strategic information need and do not need to plan for their future. On the contrary, particularly in small firms, qualitative and quantitative growth depends on the extent to which the entrepreneur is able to discern relationships between current decisions (or short-term objectives) and long-term wider goals. Being aware of dynamic relationships between current and future events is an important outcome of the *learning process* (Bianchi *et al*, 1998). In order to understand the strategic impact of current decisions on a longer time horizon, a higher selectivity of business control systems is needed. In fact, current management takes places on an on-going basis, but not all current decisions have the same level of strategic importance. Detecting weak signals of strategic change hidden in current activities implies a level of complexity that is different from longer run decisions related to capital investments. Even though, in the first case, the structure of the system to be managed (relevant variables, connections between them, delays, etc.) can be more easily defined than in the second one, monitoring strategic relevance of current events implies a major difficulty in detecting in advance *weak signals of change* as they are usually hidden in a wider range of daily occurrences in which the entrepreneur is fully involved. Particularly in the last two decades, literature on *strategic control* has been proposing several theories on how to include a ‘strategic’ view into business control systems. However, poor results have generally been attained in practice. In fact, strategic control has been applied only with reference to some large companies and very often even the most careful and straightforward strategic control system design has not been followed by a real implementation (Goold and Quinn, 1990). This sharp mismatch between theory and practice seems to be caused by the use of a *project* approach in business control systems design (Brunetti, 1985; Bergamin Barbato, 1991; Bianchi, 1996). In fact, a sharp distinction between *strategic* and *management* control system is done, based on the following implicit hypotheses, i.e.: 1) it is possible to separate *short* and *long term goals/planning* and implementation (Asch, 1992); 2) strategic control mechanisms have to support strategic planning in setting clear and precise objectives in order to *reduce complexity*; 3) *responsibility units* devoted to strategic planning and control *are different* from those oriented to strategy implementation (Lorange and Chakrawarthy, 1991); 4) *tools* supporting strategic planning and control *are different* from those supporting management control.

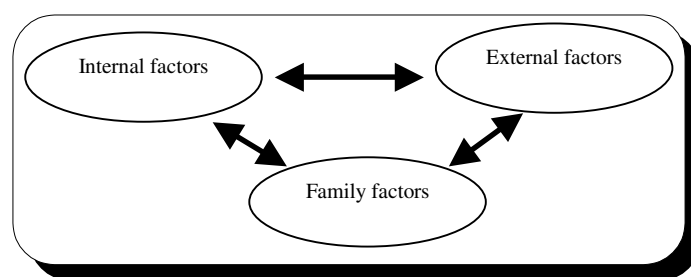


Figure 1 - Three categories of the causes of small business failure.

This approach has produced an increasing bureaucratisation and a lack of communication between the headquarters and planning staff and the operational divisions, even in many large companies characterised by an articulated organisation structure using sophisticated control tools. This situation often led divisional management to depart from policies and goals officially declared in strategic plans (*exposed theory*), in order to make other decisions (*theory-in-use*) (Argyris, 1985)

which were seen as more coherent with the characteristics of the systems to be managed. In order to include a strategic perspective into business control systems, particularly when management systems complexity and environmental unpredictability are significant, it is necessary to use a different approach. *Rather than focusing on systems design, it is much more important to affect people's mindset.* This shift from a *project* to a *behavioural* approach in control systems design is not a trivial one. *The project approach implies that people fit into the structure and its focus is on information; the behavioural approach is focused on learning.* According to this perspective, the difference between strategic and management control tends to become more blurred, as the control system (as a whole) is oriented to achieve a common goal: *strategic organisational learning*. In other words, such an approach implies that strategic control may allow people to *deal with uncertainty*, to better frame systems in which they are involved, in order to understand management complexity and unpredictability. Such a goal may be attained only if strategic management is seen as a *continuous* (rather than *discrete*) process, according to which also current actions may disclose significant strategic outcomes.

Which models and tools can support a small business entrepreneur in managing growth in a *learning-oriented* approach? Matching SD and accounting models may allow one to feed *double loop learning* (Sterman J. 1994), which supports mental models' improvement through an "intelligent" analysis of business phenomena, which are observed according to the feedback view (Morecroft J. 1994) Such an approach, at the same time, is likely to exploit, to make explicit and improve what are probably the most important strategic assets in a small firm: entrepreneurial *experience*, *perceptions* and *tacit knowledge*.

5. Exploring dynamic interrelationships between commercial, financial and equity subsystems in a small firm: a case study

An ILE illustrating how one can support policy making in a small firm through the analysis and diagnosis of feedback loops affecting operational growth, liquidity and profitability will be provided in the second section of the paper. It will be shown how exploring dynamic interrelationships between different internal and external subsystems may allow decision makers to pursue a sustainable growth, in compliance with both business and the equity-owning family available resources.

The *Small Business Growth Management Flight Simulator* has been based on the *Spinnato and Sons* case-study, that will be summarised here below.

5.1 Drawing up a budget in a learning-oriented approach

Spinnato & Sons is a family-owned business which distributes to manufacturing firms a brand of wood-cutting machines. Mr. Spinnato is the owner/entrepreneur. He makes intuitive decisions, mainly based on his knowledge and "flair for business". In the wider business *arena*, four main forces interact with the firm: competitors, customers, banks and the Spinnato family. A fragmented offer and strong competition characterise the industry. Spinnato's customers are very sensitive to price discounts, changes in terms of payment and lead (delivery) time policies. Banks grant a maximum credit on current loans. This allows the firm to finance its current monetary needs by increasing negative bank accounts. Each month a minimum withdrawal from company bank accounts is done by the equity-owning family to feed its current expenses. The family is also used to require an extra level of withdrawals, when it perceives that the company is growing. Mr. Spinnato (i.e. the player) is now drawing

up an operating budget. How decision making related to the budgeting process can be supported by accounting and SD models?

The ILE based on *Spinnato & Sons* case-study has been conceived as the core of a three days course, mainly oriented to small business entrepreneurs and their direct collaborators. The programme is also oriented to those who wish to start a new firm and to post-graduate students in business administration.

The *first day-course* is devoted to deliver participants, through a Powerpoint ® slide package, basic concepts of financial and small business growth management.

The *second day* is oriented to introduce the SD methodology as an approach to understand dynamic interdependencies between variables affected by small business growth. Participants are also asked to discuss the *Spinnato & Sons* case-study with the aim to make explicit their mental models on the issues covered in the ILE.

In the *third day* the Small Business Growth Flight Simulator is played.

5.2 General briefing

A *general briefing* is initially done in order to introduce how to run the ILE. Such a briefing consists of three parts: 1) *main sub-systems* of the ILE (i.e. the company, customers, competitors, banks and Spinnato family); 2) the *users' task* (i.e. setting policy levers to improve performance, in terms of *profitability*, *liquidity* and *family satisfaction* in a four years time horizon); 3) *budgeting* planning. Decisions on sales price, terms of payment allowed to customers, lead time, safety inventory coverage, withdrawals to family assets, investments from family assets, and allowed extra current family expenses are made quarterly. Users start to draw up the budget for the first year through an Excel® spreadsheet interface ² (figure 2). According to adopted policies, they have also to assess future sales quantities. After setting policies for the first year, users may check from Excel® windows the related *economic* (Profit & Loss and Break-even analysis) and *financial* (Financial and Flow of Funds Statements) *budgeted results*, that are automatically portrayed in a spreadsheet model, based on linear relationships and computations, regardless delays between causes and related effects. On the basis of spreadsheet results, they are able to adjust their policies in order to achieve desired goals, e.g., in terms of sales revenues, market share, current income, cash flow, debts-to-equity ratio, etc. Then, they are ready to simulate their budget decisions through an SD model built in a Powersim™ environment. After a Powersim™ simulation has been done, results are automatically transferred to the Excel® file. Although, both the spreadsheet and the SD model share a same database, the latter follows a different approach. In fact, it takes into account feedback loops, delays, non-linearities and *soft* variables that is very hard to include in a spreadsheet model. Once users have formulated a set of hypotheses explaining the causes of variances related to the first year, they may modify the original budget and repeat the simulation, in order to verify their assumptions. Then, they can move to draw up the budget for the first 6 months of the second year. The above commented iterative *planning-and-simulation* process will be extended, with a six months step, over the all 4 years budget period. Then, participants are asked to move to Powersim™, in order to experience decision making process in a different environment. In fact, the Powersim™ environment provides a wider range of financial and *soft* variables (such as those related to the family “quality of life”) and simulation functions, which allow users to reinforce the learning process.

² The spreadsheet interface portrayed in figure 2 has been built in order to provide a friendly environment to which participants are accustomed.

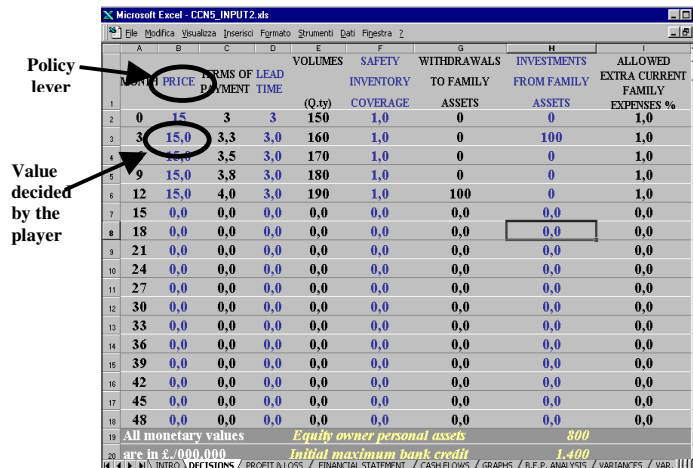


Figure 2 – Spreadsheet budget input shell

As it is possible to observe from figure 3, a Powersim™ input shell may either accept budget decisions from the Excel® model or from the slider-bars displayed in the left-hand side of the window. In a further step, budgeting decisions will be made through Powersim™ slider-bars (by setting the “Input from Powersim” option) in order to assume, and then verify, competitors’ reactions to commercial policies (*Strategic Mode*). *Strategic Mode Simulation* allows users to test different behaviours related to market reactions to company commercial policies before decisions are accepted. After a strategic simulation, users may decide to repeat it by either keeping the past trial values or setting new decisions. This enables them to evaluate the consequences of their assumptions, i.e., to explore how the system structure responds to their hypotheses. During the simulation, learners may also check both business and family performances through the Powersim™ windows, i.e., business or family graphs and reports. Figure 4 depicts the above commented budgeting process, based on a learning-oriented spreadsheet and SD model environment.

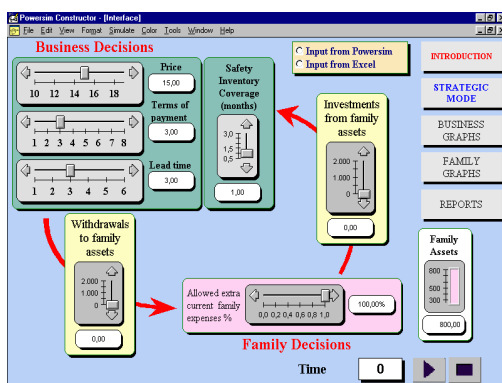


Figure 3 - Powersim™ input shell

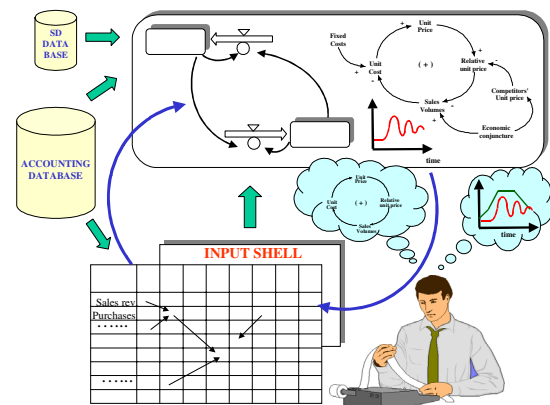


Figure 4 - Budgeting learning-oriented process

5.3 Detailed briefing and Base run

In the *detailed briefing*, the Spinnato case-study is reviewed in order to give users an insight of the picture in which they will be involved. They take the role of Mr. Spinnato, they are in charge to manage his family firm, they have the same problems he faced, they have to pursue company growth taking into account both family and company requests. Some *base runs* are then displayed and commented on by learners.

The base run allows one to become familiar with Powersim™ interface and to be aware of Spinnato's business environment. After several simulation runs, users will be able to manage *The Small Business Growth Management Flight Simulator*.

5.4 Simulation

Combining Excel® and Powersim™ simulation into the ILE allows participants to close the *learning process* loop. In fact, the *traditional budgeting process* is based on a *single loop approach* which implies a comparison of actual with standard values and *ex post* variance analysis, that may feed back to modify the initial budget hypotheses (figure 5). However, according to such an approach decision makers' mental models may not be questioned by them when actual and budgeted data are compared. In fact, quite often people are more used to focusing their attention on the computation of such variances and their division in *sub-variances*, rather than on the analysis and interpretation of their real causes. Variances analysis is related to: sales volumes, inventories, accounts receivable, current income, bank accounts, cash flows, investments from personal assets and sales revenues.

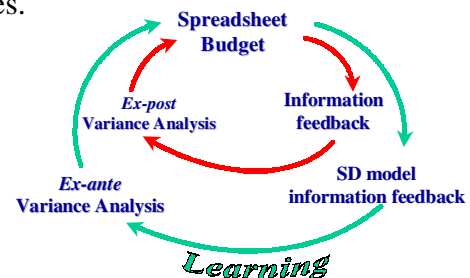
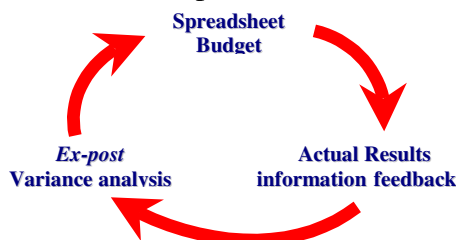


Figure 5 – Traditional single loop budgeting approach Figure 6 – Double loop learning in the budgeting process

Matching the SD with traditional budgeting approach allows decision makers to *ex ante* reformulate the budget, according to a more careful analysis of the inter-related forces which drive business performance. Such an approach is oriented to capture feedback loops between relevant (internal and external) variables, delays and non-linear relationships, in order to improve key-actors' mental models (figure 6). Such an approach is likely to foster *double loop learning*.

5.5 De-briefing

The last step in the suggested learning process is *de-briefing*. It activates double loop learning as it opens the participants' mind to shift from a fragmented and static approach to a *holistic* and dynamic perspective. Participants are asked to comment on their decisions and to give an explanation of system behaviour. Some of the issues which are usually raised in the discussion include: competitors' reactions, demand elasticity, limits to market growth, relationships between sales growth and net working capital, shortages in allowed bank credit, trends in family climate and, more generally, time delays and non-linear relationships. The outcome of this process is twofold: a) feedback loops are identified, and b) system boundaries are focused.

These learning targets are also pursued by showing information on *market reactions* to decision makers' policies. These pieces of information were not previously available in the interface used to draw up the budget. Such a constraint to user's information is due to the need to replicate real conditions under which decisions are usually made, particularly in small firms. The portrayed behaviours support participants in raising more focused and relevant questions in order to understand the deep causes underlying their decisions. In order to give the reader a more concrete

insight of possible outcomes emerging from the de-briefing process, two scenarios are discussed here below.

5.5.1 Fast growth, profitability and liquidity failure caused by emotional commercial policies in response to liquidity shortages

A first scenario gives an example of irrational and emotional company policies, based on a mismatch between commercial and financial sub-systems (figure 6).

In order to increase market share and sales revenues, the entrepreneur progressively rises the terms of payment during the first year and decreases prices in the second year.

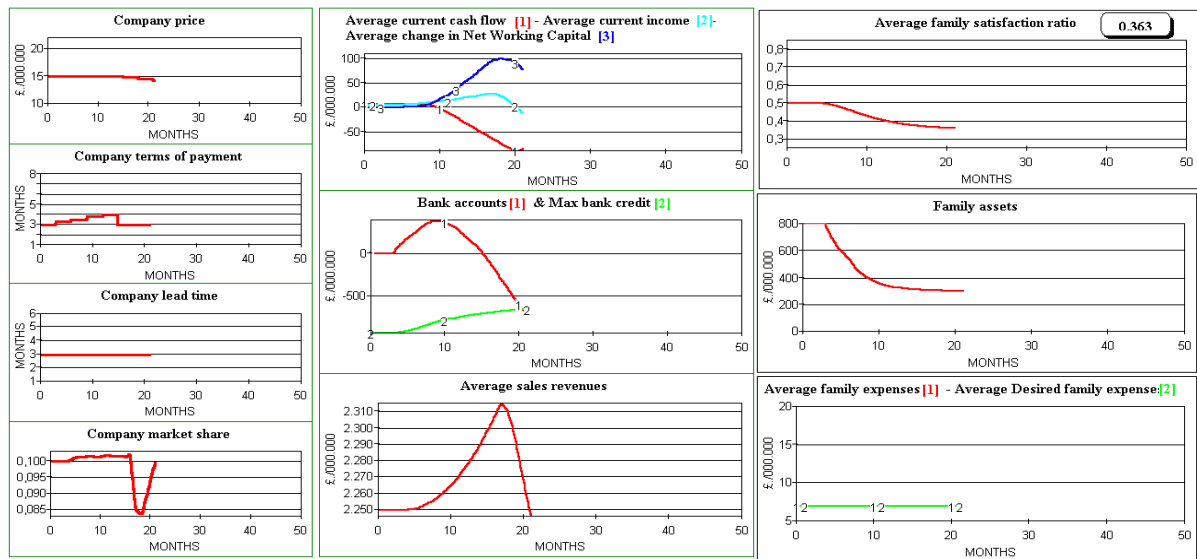


Figure 6 – Business and Family graphs

It is possible to identify four main consequences related to this scenario: 1) market share and sales revenues gradually increase, due to a slow rise in terms of payment; 2) in spite of higher sales revenues, the current income slightly increases and reaches a limit to growth earlier than sales revenues³; 3) net working capital shows a pattern of behaviour that mirrors current income, leading to a negative cash flow⁴ which fully absorbs equity-owner's initial investments; 4) investments from personal assets progressively decrease average family satisfaction ratio.

Around the 15th month, the entrepreneur realises that the business' financial structure does not allow the above strategy to sustain; another limit to the market share increase is also found into competitors' reactions to terms of payment increases. In order to overcome the above limits to market share growth, the entrepreneur decides to shift from a *terms of payment* to a *price based* commercial policy. In the entrepreneur's mind, resetting terms of payment to their initial value would have allowed the firm to immediately restore both the net working capital and liquidity. At the same time, such a strategy was intended to foster an increase in both market share and sales revenues. However, the expected outcomes are sharply different from the actually achieved results. In fact, as figure 6 portrays, from around the 15th month, both market share and sales revenues dramatically fall, leading to a negative current income and still to a negative cash flow. Such behaviour originates from: 1) a delayed competitors'

³ This behaviour is due to both a decrease in unit sale price and a rise in interest costs on negative bank accounts

⁴ Current cash flow = Current internal flow of funds - Δ Current net working capital.

reaction to the decrease in company's terms of payment, leading to a lower market appeal of the firm; 2) a delayed customers' perception of company price decrease; and 3) a delayed market share increase which does not compensate the decrease in price.

The result of this scenario is failure, that is mainly caused by the exploitation of allowed maximum bank credit. It is worthwhile to observe that maximum bank credit shows a decreasing pattern over time (in absolute value), because of a family assets decrease and a "debts-to-equity" ratio increase. From the above scenario one can learn that *resetting a policy lever to its initial value does not necessarily imply that the system is restored to its initial state*. In fact, current policies contribute to change the *structure* of the environment in which the firm operates. In other words, it is not only the internal environment that determines business performance: in fact, the way the firm interacts with a wider range of "actors" (clients, competitors, banks, etc.) operating *from outside* must be taken into consideration in order to understand business dynamics as a condition for policy setting (Forrester J., 1994, 1973; 1975; 1968).

5.5.2 Fast growth and liquidity failure caused by uncontrolled family withdrawals and lack of invested capital

A second scenario shows how company failure may be caused by a growth policy that is not sustainable because of excessive bank withdrawals aimed at increasing the family "quality of life", both in terms of current expenses and personal assets. Such phenomenon is mainly caused by bias in profit and cash flows expectations and related distorted information, combined with entrepreneur's emotional involvement in coping with the business/family overlap. As portrayed in figure 7, the firm pursues a growth policy based on both a decrease in lead time and an increase in terms of payment. In order to finance such an aggressive policy, the entrepreneur decides to progressively increase sale price and to reduce safety inventory coverage⁵. In the 3rd month, terms of payment are increased to 4 months. As a consequence of such policy, on the one hand both company market share and sales revenues increase. On the other hand, net working capital decreases (in spite of higher sales volumes and terms of payment) because of lower inventories caused by the reduction in safety inventory coverage. The combined effect of higher income and lower net working capital leads to an increase in net cash flow. At around the 6th month, the entrepreneur increases average sale price: in his mind, such an increase is justified by a better product appeal perceived by clients, because of higher terms of payment and lower lead time. The initial effect of such a policy is an increase in both the current income and liquidity, due to higher sales revenues and sales unit contribution margin. However, market share decreases for two main reasons: 1) customers are more sensitive to lower prices than higher terms of payment, and 2) the competitive advantage of the firm in "terms of payment" and "lead time" has been progressively reduced because of competitors' reactions to company's aggressive commercial policies. Such an analysis suggests again that decision makers need to *understand market dynamics* before setting their policies. In order to counterbalance such a decreasing pattern in market share, at around the 9th month, the entrepreneur decides to support the "high price – high terms of payment" strategy with a lower lead time. At the same time, expectations of further growth in both profits and cash flows lead him to divest accumulated monetary

⁵ Safety inventory coverage is the number of months of sales kept on stock. A reduction in safety inventory coverage leads to a decrease in inventory financial needs. On the other hand, particularly when the firm pursues aggressive commercial policies aimed to increase sales volumes, a too high reduction in such a parameter rises actual lead time (i.e. delivery delay).

resources, in order to increase family assets (e.g., buying property) and “quality of life”. Also average family current expenses are increased from 7 to about 8.5 millions £ per month. As a consequence of the above decisions, on the one hand the level of family satisfaction grows (see “family satisfaction ratio”, portrayed in figure 7). Nevertheless, on the other hand, both business profitability and liquidity dramatically worsen. In fact, the lower lead time strategy is only able to generate a delayed and transient increase in both sales volumes and revenues. Such a behaviour is once again explained by competitors’ reactions, associated to their high sensitivity to lead time, which limit business sales revenues and current income growth. In particular, from around the 15th month, when it is more difficult to further operate on commercial policy levers, the company liquidity begins to erode for three main reasons: 1) the higher financial needs associated with increased net working capital resulting from higher accounts receivable from the rise in terms of payment; 2) the decreasing sales revenues resulting from price increase and competitors’ reactions to the business’ aggressive commercial policy; and 3) the too high “debts-to-equity” ratio, if compared to the low available bank credit and the rising financial needs associated with the pursued growth rate of the firm. At around the 18th month, in order to overcome such financial stress and the experienced limits to market share growth, the entrepreneur reduces lead time again. As a consequence of this policy, both market share and sales revenues grow again. However, they also imply a further increase in net working capital and, hence, higher financial shortages. The above said financial difficulties develop into a crisis and eventually into a failure (Lyneis J., 1980: p. 359). In this scenario, *profitability* is not compatible with *liquidity*.

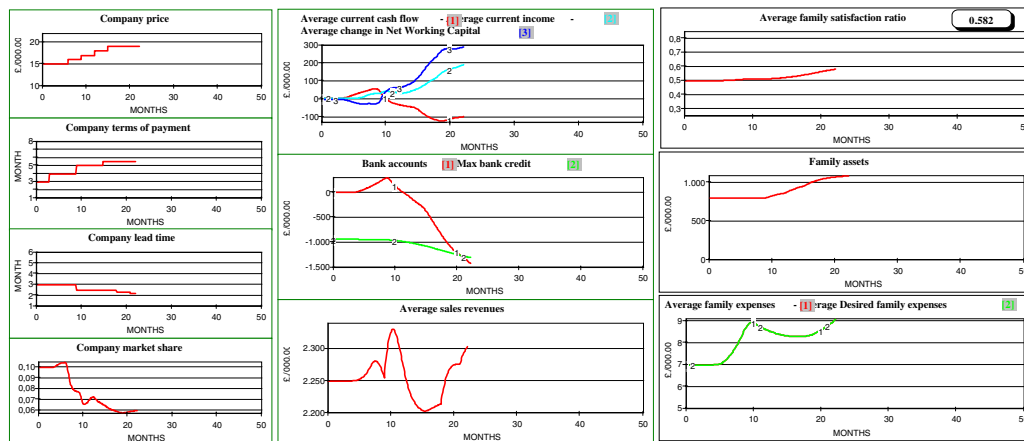


Figure 7 – Business and Family graphs

5.6 Feedback analysis

The two scenarios commented above depict some of the most common behaviours that participants are expected to experience in running the *Small Business Growth MFS*. As previously remarked, during the budgeting process, participants compare expected⁶ with SD model behaviours related to their policies. Such a comparison leads them: 1) to figure out and sketch causal relationships among relevant variables, and 2) to fine-tune their policies according to detected variances. Such an analysis is done by groups (each of them including no more than three participants) during the

⁶ Expected behaviours are originated by participants’ mental models. They are depicted through the Excel ® interface and, then, compared with the SD simulation results.

simulation process. After the simulation phase, in a plenary session a facilitator asks participants to describe their experience and helps them in identifying main relevant sub-systems and related feedback loops (figure 8). The learning process enhanced by the use of the *Small Business Growth MFS* implies that *SD model information* feeds back to the previous steps in order to allow users to review under a different perspective the investigated issues. *Double loop learning* is reinforced by the debriefing process, which opens up the learners' mind in order to better understand the real causes underlying family business growth dynamics. The most significant feedback loops originated by decision makers' behavioural analysis are portrayed here below. A first positive loop emerges from the effects generated by terms of payment increase. After a delay, such an increase gives rise – *ceteris paribus* – to an increase in customers, which determines higher sales revenues and current income. A higher current income implies a growth in the cash flows (given an unchanged net working capital), which increases bank balance and available bank credit. An increase in perceived available bank credit allows the entrepreneur to rise terms of payment again (figure 9). However, growth in sales revenues, income and cash flows, based on a terms of payment policy may be counterbalanced, sooner or later, by liquidity shortages caused by a net working capital increase. Such an increase is due to the higher sales revenues and higher average terms of payment allowed to customers. When the increase in accounts receivable and average inventory is not offset by an increase in accounts payable (due to terms of payment negotiated with suppliers), the change in net working capital will decrease cash flows. That will reduce available bank credit.

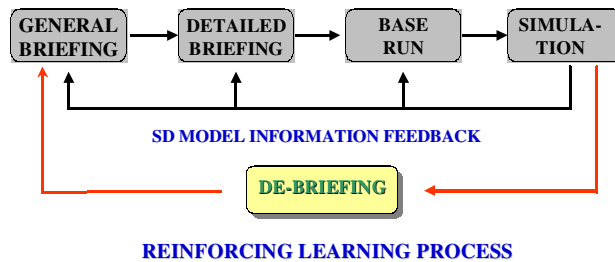


Figure 8 – The learning process overview

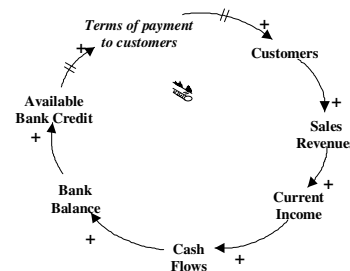


Figure 9 – Positive terms of payment loop

If the entrepreneur realises that a liquidity shortage might slow down growth, he will soon either stop increasing terms of payment allowed to customers or will increase equity, through investments from family assets. The entrepreneur could also restore the debts-to-equity ratio and reduce terms of payment growth rate. It is a matter of finding a *fine tuning* between the average level of terms of payment and the level of equity invested in order to tackle the dominance of the negative feedback loop originating from the net working capital (figure 10). Whereas financial shortages are not promptly perceived and corrective policies are not adopted, further increases in terms of payment will give rise to a higher net working capital which will worsen liquidity even more. Eventually, negative bank accounts will produce interest costs that will progressively increase bank debts (positive loop), on a side, and will reduce the current income, cash flows and bank accounts (positive loop), on another side. The effects generated by terms of payment (and, more generally, commercial) policies are not limited to the internal business system. In fact, such policies will cause competitors' reactions, aimed at filling the gap in terms of payment. Adjustments in competitors' policies will reduce the increase in the customer base that the firm will be able to obtain as a consequence of its commercial policies (negative feedback loop

of figure 11). On the other hand, competitors' aggressive commercial responses will increase the potential market. This will increase – *ceteris paribus* – the number of customers that the firm will be able to get from the market (positive feedback loop of figure 11). Figure 12 provides a wider insight into the main feedback loops associated with commercial policy levers operated by the entrepreneur. It shows how a low price strategy may lead to an increase in the customer base and (if the volume increase offsets the decrease in contribution margin) sales revenues, that could suggest decision makers to further decrease prices (positive loop). Likewise, a lower lead time could lead to a larger customer base and a higher sales revenues that could induce decision makers to further decrease lead time (positive loop). However, lead time strategy finds two internal limits two growth, associated with negative feedback loops. The first one is related to the increase in net working capital, due to higher inventories caused by increased sales volumes and safety stocks. The second one is associated with higher delivery costs that would be sustained to achieve a faster dispatching of goods. Likewise terms of payment, also growth strategies based on price and lead time can be counterbalanced by competitors' reactions that would decrease the gain in customer base associated with an aggressive use of the above policy levers (negative feedback). On the other hand, the same reactions could also increase the potential market, thereby also rising the gain of new customers that the firm would be able to get from its commercial policies.

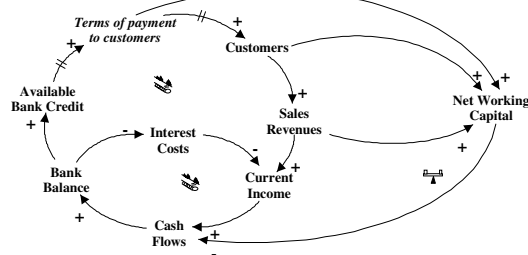


Figure 10 – Limits to growth and risks of failure from net working capital dynamics

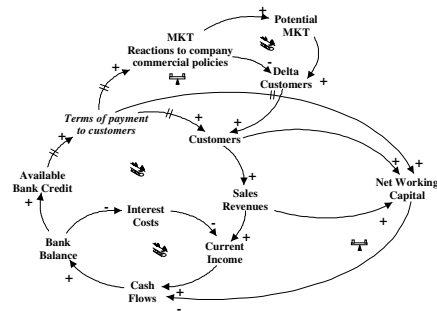


Figure 11 – Competitors and customers' reactions to company commercial policies

Other relevant feedback loops are related to the *business-family overlap* (figure 13). The more the company grows and perceived current income and cash flows increase, the higher number of family members' withdrawals requests will result. A positive loop characterises the relationship between family requests and bank withdrawals allowed by entrepreneur. In fact, an increase in family current withdrawals is likely to stiffen family requests on a higher level. However, the spiral “withdrawal requests for current expenses ⇒ withdrawals actually operated on business bank balances ⇒ withdrawal requests for current expenses” can be counterbalanced – sooner or later – if the entrepreneur perceives two emerging negative feedback loops associated to escalating withdrawals. In fact, on the one hand the increasing liquidity withdrawals give rise to lower bank balances. On the other hand, being such withdrawals an interim dividend on perceived profits, they would cause a decrease in business equity (net worth), leading to a higher “debts-to-equity” ratio that would determine a lower liquidity, because of a weaker business perceived solvency, resulting in a lower available bank credit. As shown by the second scenario previously commented, misperception of inter-relationships between commercial, financial and family subsystems may lead to company failure. In order to avoid such risks, decision makers may invest new resources from family assets into the firm (negative feedback loop “investments ⇒ bank balance ⇒ available bank credit ⇒ investments”).

Nevertheless, the above investments may cause a lower family satisfaction, which could also lead to a business crisis⁷. The entrepreneur may overcome such threat through withdrawals of liquidity from bank accounts to increase family properties (negative feedback loop)⁸.

Balancing withdrawals and investments to achieve an adequate family satisfaction ratio that is compatible with business liquidity, and matching commercial policies with financial structure are the key to survival and growth of both the business and the family. Three main *key performance indicators* resulting from the above analysis are: current income, available bank credit and family satisfaction ratio.

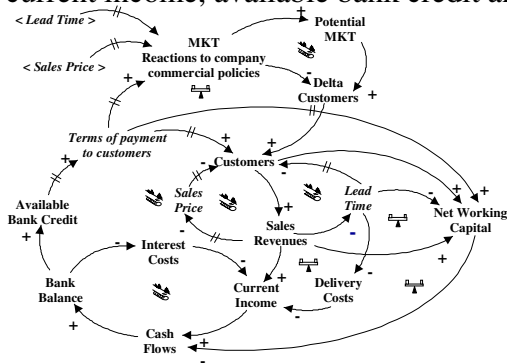


Figure 12 – Main feedback loops related to company commercial policies

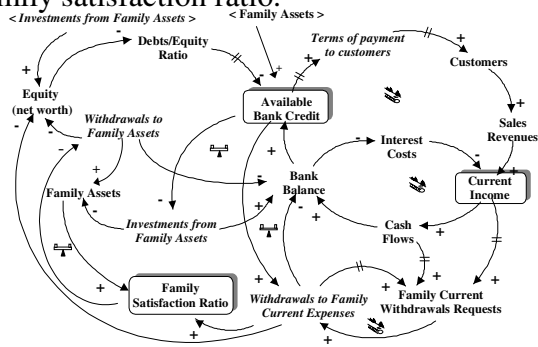


Figure 13 – Main feedback loops related to business-family relationships

5.7. What one can learn

To summarise, the *Small Business Growth MFS* supports participants in understanding: a) effects of current commercial policies on the financial structure in the medium-long term; b) limits to sales growth generated by the financial structure; c) limits to sales growth generated by competitors’ policies and potential market; d) perils from symptomatic solutions to liquidity shortages; e) perils from escalating aggressive commercial policies in response to competitors’ reactions; and f) perils from irrational liquidity withdrawals due to bias in profit and cash flow expectations, to increase the equity-owning family “quality of life”.

It is possible to refer some of the most significant issues covered by the above analysis to three main archetypes (figure 14): 1) limits to growth; 2) shifting the burden; and 3) escalation. The inner section of figure 14 portrays *limits to business growth*, caused by the net working capital dynamics. The upper section shows how the *shifting the burden* archetype may describe the unintended effects of undercapitalization on both liquidity and profitability. The bottom section illustrates the risks of *escalation* related to a war on *price* (or other commercial levers) between the firm and its competitors. Another important message which emerges from the above remarks is that decision makers ought to set their policies not only on the basis of their internal environment, but also based on the dynamic relationships between the firm and external actors (competitors, customers, suppliers, banks, etc.) with whom it interacts. Exploring relevant system boundaries is not a matter of building huge

⁷ In fact, a lower family satisfaction ratio may give rise to contrasts among family members, that would reduce the confidence towards the entrepreneur and involve him in making emotional and reactive business decisions.

⁸ It is worth remarking that both withdrawals and investments also produce their effects on business equity.

models, but instead of selectively understanding how external sub-systems interact with the firm.

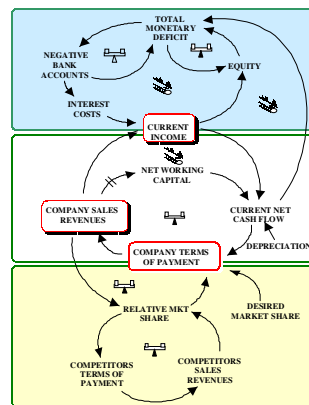


Figure 14 – Systems archetypes underlying small business growth dynamics

References

- Aitchison G. and Van Auken H. and Komacara M. (1994), An Analysis of Operational Problems Faced by Small Family Firms Versus Nonfamily Firms, *Proceedings of the Small Business Institute Director's Association Conference*.
- Argyris C. (1985), *Strategy, Change and Defensive Routines*, Pitman, Boston.
- Asch D. (1992), Strategic Control: A Problem Looking for a Solution, *Long Range Planning*, vol. 25, No. 2.
- Ault, T. and Miller, M. (1985), Eliminate Small Business Failures: Twelve Basic Rules, *Proceedings of the Small Business Institute Director's Association Conference*.
- Bergamin Barbato M. (1991), *Programmazione e Controllo in un'Ottica Strategica*, Utet, Torino.
- Bianchi C. (1996), *Modelli Contabili e Modelli Dinamici per il Controllo di Gestione in un'Ottica Strategica*, Milano, Giuffrè.
- Bianchi C. and Winch G. and Grey C. (1998), The Business Plan as a Learning-Oriented Tool for Small/Medium Enterprises: a Business Simulation Approach, *Proceedings of the International System Dynamics Conference*, Quebec.
- Bolton J.E. (1971), *Small Firms: Report of the Commission of Inquiry on Small Firms*, London.
- Bradley III D. (1997), The "Why" of Small Business Bankruptcy, *Proceedings of the Small Business Institute Director's Association Conference*, Orlando, Feb. 5-8.
- Brunetti G. (1985), *Il Controllo di Gestione in Condizioni Ambientali Perturbate*, Milano, Franco Angeli.
- Cressy R. (1996). Small Business Failure: Failure to Fund or Failure to Learn by Doing? *Proceedings of the International Council on Small Business Conference*, Stockholm, June 16-19
- Curran J. and Burrows R. (1989), Shifting the Focus: Problems and Approaches to Studying the Small Enterprise in the Service Sector, *Proceedings of the Twelve National Small Firms Policy and Research Conference*, London.
- Forrester J. (1968), Market Growth as Influenced by Capital Investment, *IMR*, MIT, Vol 9, No. 2.
- Forrester J. (1973), Counterintuitive Behavior of Social Systems, *Technology Review*, n.3

- Forrester J. (1975), The impact of Feedback Control Concepts on the Management Sciences, *Collected Papers of Jay Forrester*, Productivity Press, Portland, Oregon.
- Forrester J. (1994), Policies, Decisions, and Information Sources for Modeling, *Modeling for Learning Organizations* (edited by Morecroft J., Sterman J.), Portland, Productivity Press.
- Goffee R. and Scase R. (1980), Problems of Managing Men, *Small Business Guardian*.
- Gumpert D. and Boyd D. P. (1985), The Loneliness of the Small-Business Owner, *Harvard Business Review*.
- Festervand T. A. and Forrest J. (1991), Small Business Failures: A Framework for Analysis, *Proceedings of the Small Business Institute Director's Association Conference*, Orlando.
- Goold M. and Quinn J. (1990), The Paradox of Strategic Controls, *Strategic Management Journal*, vol. 11.
- Hutchinson P. and Ray G. (1986), Surviving the Financial Stress of Small Enterprise Growth, in Curran J & Stanworth J & Watkins D. (editors) *The Survival of the Small Firm*, Vol.1, Gower, Brookfield
- Landsberg I. (1983), Human Resources in Family Firms: The Problem of Institutional Overlap, *Organizational Dynamics*, n. 12 (1).
- Limbloom C. (1959). The Science of Muddling Trough, *Public Administration Review*, Spring.
- Lorange P. and Chakrawarthy B. (1991), *Managing The Strategy Process*, Prentice Hall, Englewood Cliffs.
- Lussier, R. & Corman, J. (1995), There are Few Differences Between Successful and Failed Small Business, *Proceedings of the Small Business Institute Director's Association Conference*.
- Merikas A. and Bruton G. and Vozikis G. (1993), The Theoretical Relationship Between the Strategic Objective of Sales Growth and the Financial Policy of the Entrepreneurial Firm, *International Small Business Journal*, 11,3.
- Moran P. (1997), Profiling the Small Business Owner-Manager: Identifying Personal Characteristics Linked to "Growth-Orientation", *Proceedings of the International Council for Small Business Conference*, S. Francisco, June.
- Morecroft J. (1994), Executive Knowledge, Models and Learning, in Morecroft J & Sterman J. *Modeling for Learning Organizations*, Productivity Press, Portland, Oregon.
- Nix P and McFetridge M. (1987), The Importance of Working Capital in the Financing of Current Assets, *Proceedings of the Small Business Institute Director's Association Conference*.
- Olivera H. and Martin C. (1993), Accounting Problems Encountered in Small Business Failures, *Proceedings of the Southwest Small Business Institute Association, Annual Conference*, New Orleans, March
- O' Neil H. and Duker J. (1986), Survival and Failure in Small Business, *Journal of Small Business Management*, vol. 21, n.1.
- Peel M. and Wilson N. (1996), Working Capital and Financial Management Practices in the Small Firm Sector, *International Small Business Journal*, 14, 2.
- Schulze W. and Dino R. (1998). The Impact of Distribution of Ownership on the Use of Financial Leverage in Family Firms, *Proceedings of the U.S. Association for Small Business & Entrepreneurship Conference*, Clearwater, January.
- Sterman J. (1994). Learning in and about Complex Systems, *System Dynamics Review*, n. 10.