The Development and Application of the Balanced Scorecard for the Irish Dairy Farm Manager

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Abstract

Agriculture’s primary role is that of producing food and fibre. However, in recent years its contribution to the viability of rural areas, food security, the cultural heritage and environmental benefits has increased dramatically. These additional functions of multi-functional agriculture make it imperative that farmers seek the best professional help and advice available and draw up a strategic plan for their future business at a time of major change in the agricultural industry.

Kaplan and Norton developed a Balanced Scorecard (BSC) at Harvard University in the 1990’s. The BSC is an interrelated set of financial and non-financial performance measures that reflect the multi-functional nature of an agricultural business. In this research the BSC model has been applied and modified through case study research and a Delphi study to the Irish dairy farm business and subsequently called the Dairy Farmer Scorecard.
Introduction

To say we are living in a period of rapid change in the Irish agricultural industry has become a cliché. The industry is under relentless pressure to adjust to changing external circumstances. The Common Agriculture Policy (CAP) reforms have reshaped the direction of European Union (EU) thinking in relation to agriculture, which in turn is a response to market, budget, trade – World Trade Organisation (WTO) and enlargement factors. As time passes, both at national and EU level, there is an increasing emphasis on the relationship between agriculture and the environment with environmental cross-compliance becoming the norm. At processing level, food safety, animal health, food traceability and assurance for the consumer have become major issues. The part-time farming family with up to two off-farm incomes is a crucial part of emerging rural life. A constantly changing structure in rural communities is providing farm operators with new opportunities e.g. cottage industries, rural tourism, farm relief, among others. Therefore, beyond its primary role of producing food and fibre, agriculture also contributes to the viability of rural areas, food security, the cultural heritage and environmental benefits such as the agricultural landscape, agro-biological diversity, land conservation and high standards of plant, animal and public health. These additional functions of the multi-functional agriculture make it imperative at this point of dramatic change in the industry that farmers would seek the best professional help and advice available and draw up a strategic plan for their future business.

Kaplan and Norton developed a Balanced Scorecard (BSC) at Harvard University in the 1990’s. The BSC is an interrelated set of financial and non-financial performance measures that reflect the multi-functional nature of an agricultural business. It gives Irish dairy farm managers important information from four different perspectives a) financial; b) internal business; c) customer and d) innovation and learning, which together offer a holistic view of the health of the farm business. It also allows managers to consider all of the important functions of the farm business simultaneously, enabling them to determine whether improvements in one perspective are achieved at the expense of the others.

Purpose of the Paper

This research acknowledges the multi-functional nature of Irish dairy farming and a Dairy Farmer Scorecard (an adaptation of the BSC for the Irish Dairy Farmer) is developed that will allow Irish dairy farmers simultaneous consideration of all of the important strategic measures of the farm business.

Methods and Data Sources

In conducting research to develop and apply the BSC to Irish dairy farming, six in-depth case studies with Irish dairy farmers were carried out in 2002 and a Delphi study with farm management experts was undertaken in 2003.

Case studies provide significant detailed information in a holistic investigation of a situation (Casey and Lury, 1982). Research carried out in New Zealand concluded that the application of the BSC could only be tested on case study farms where a formal farm strategy had been developed (Rawlings et al., 2000). Therefore, the farmer group selected to participate in this case study research were owner-operator dairy farmers who were members of the Kerry Programme for Profit organised by Teagasc (Agriculture and Food Development Authority, Ireland) and Kerry Agribusiness PLC (Bartlett, 2000). The
mission statement of the Kerry Programme for Profit states: “We will empower our client farmers with:

- The most up-to-date technical advice
- The financial expertise to set and achieve financial goals”.

As the objective of the research was to test and modify a quite advanced strategic management tool on these farms the principle researcher organised strategic planning process sessions with each of the farm participants. This involved identifying their vision for the family farm business based upon the individual value sets of each farmer and conducting a three-year business analysis. Subsequently the ‘strategic gaps’ that existed in each business between their visions and the current performance was identified. The goal mix that best addressed that gap was then established along with the measures for each goal (the outcome and lag measures and the drivers or lead measures). The farmers then identified the linkages between their goals and their vision.

The *Delphi technique* is a group facilitation technique that seeks to obtain consensus on the opinions of ‘experts’ (respondents) through a series of structured questionnaires (commonly referred to as rounds). The selection of the panel of ‘experts’ involved a non-probability sampling technique, namely purposive sampling. Purposive sampling is based on the assumption that a researcher’s knowledge about the population can be used to handpick the cases to be included in the sample (Polit et al., 2001). As with the classical Delphi technique Round 1 of this study, began with an open-ended set of questions that generated ideas and allowed participants complete freedom in their responses. The initial questionnaire also obtained a personal profile of the respondents as well as the respondent’s own rating of their ‘level of expertise’ in relation to the Dairy Farmer Scorecard. The Statistical Package for Social Sciences (SPSS) was employed to conduct statistical analysis regarding group collective opinion, which was ‘weighted’ using the respondent’s rating of their own ‘level of expertise’ in relation to the Dairy Farmer Scorecard. The results from this initial questionnaire helped in formulating the second questionnaire. This process continued until consensus was obtained. Traditionally the Delphi technique has been paper-based but in this study electronic communications were employed, as the panel possessed the necessary access and skills.

**Results**

**Case Study Research**

The exact format of the BSC is dependant upon the nature of the business and a large number of different formats have been developed. In this respect the BSC is a contingent rather than a generic formula. Observations made while carrying out the case study research required that the researcher adjust the original model by Kaplan and Norton in order to reflect the multifunctional nature of the Irish dairy farm business. The case study farm families found their BSC’s useful as it displayed their complex business plans in a succinct format. The key aspects of their business plans were highlighted and the identification of key performance indicators was simplified by understanding the cause and effect linkages embedded in their strategy. One of the most important aspects of developing a BSC for a farm business is that it allows farm businesses to identify the clear purpose behind their business development.

As one of the case study farmers had not developed an overall objective or mission statement for the farm business, this farmer struggled to identify goals and also had limited monitoring systems in place. This finding is consistent with literature (Dobson
and Starkey, 1994; Parker et al., 1997; Willyerd, 1997), which stated that without
direction or focus, goals cannot be identified. This couple demonstrated a short-term
focus only.

In conducting the case study research to apply the BSC to Irish dairy farm business the
following observations were made (Figure 1):

The research application of the BSC to Irish dairy farming showed that the Internal
Perspective focus on many of the case study farms was characterised by strong goals
which had a tactical and operational management focus. An operational and tactical
focus is essential for the immediate success of the business. However, the fact that
success at these levels is a prerequisite for farming is important to most farmers but the
ability to use those skills to manage strategic change is not as easily understood by the
same farmers. If there are not strategic changes required by a business, the strategic gap
is small. Therefore continuing to deliver at operational and tactical levels maybe all that
is required of management. The underlying assumption here is that the business will
continue to survive if day-to-day and seasonal management is carried out well. While
this may be understood by the case farmers the process of the research effort on these
farms showed that there is still a need to monitor some basic strategic measures to ensure
that the goals are achieved. Based on the nature of the family farm business this
perspective was renamed Productivity & Efficiency Perspective to reflect the production
focus of most farm businesses.

The Financial Perspective was relatively straightforward with goals and indicators being
readily identifiable. The farmer’s ability to identify financial measures appeared to
depend directly on the level of financial analysis they had undertaken. The measures
identified, generally, did not cover the whole business and the focus tended to be on the
operational measures related to production and operational profit.

The Customer Perspective varied in its prominence depending on the scale of the farming
enterprise. The research encouraged the case study farmers to include aspects relating to
the environment and to EU and government regulations under this perspective, as well as
customer issues. The dairy farmers generally did not consider themselves to have
customers or they viewed the dairy company as their customer. Consequently identifying
measures for the customer perspective proved difficult for farmers. Few considered it
important to have a good relationship with their suppliers, for example, fertiliser
suppliers, veterinarians and bankers. The case study farmers included issues relating to
the EU and government regulations under which they are forced to farm. Environmental,
safety and quota regulations were to the fore for most farmers. As a result of including
these issues under this perspective it was renamed the Environmental, Regulations &
Customer Perspective.

The Innovation and Learning Perspective in the BSC was broadened to include personal
goals such as time-off, family holidays, educating the children, decorating the house,
succession issues etc. to reflect the family nature of the farm business. To better reflect
the inclusion of these issues the perspective was renamed the Learning & Growth
Perspective. Under this perspective issues relating to further training were also covered,
such as attending discussion group meetings, visiting New Zealand to learn from the New
Zealand dairy farm experience etc. Areas identified for additional training often related
to issues off the farm such as off-farm investment or their own training in financial management techniques.

<table>
<thead>
<tr>
<th>Learning &amp; Growth</th>
<th>Goal</th>
<th>03 Farm YR Target</th>
<th>Actual</th>
</tr>
</thead>
<tbody>
<tr>
<td>Visit New Zealand</td>
<td>2004</td>
<td>Make 5 new contacts</td>
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<td>House Renovations</td>
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<td>complete</td>
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<tr>
<th>Financial Perspective</th>
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<th>Actual</th>
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<tr>
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<td>15%</td>
<td>12%</td>
<td></td>
</tr>
<tr>
<td>Calving Pattern (w)</td>
<td>8</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>Cash-flow Ratio</td>
<td>40%</td>
<td>42%</td>
<td></td>
</tr>
<tr>
<td>Our Values:</td>
<td>Days at grass</td>
<td>360</td>
<td>270</td>
</tr>
<tr>
<td>Common Costs (c/l)</td>
<td>11 c/l</td>
<td>13 c/l</td>
<td></td>
</tr>
<tr>
<td>* Quality family time</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Protein percentage</td>
<td>3.5%</td>
<td>3.45%</td>
<td></td>
</tr>
<tr>
<td>Set-up Ltd. Company</td>
<td>2003</td>
<td>complete</td>
<td></td>
</tr>
<tr>
<td>* Life long learning</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>* Building for the next growth</td>
<td></td>
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<tbody>
<tr>
<td>Quota per acre</td>
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<td></td>
</tr>
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<td>Complete</td>
<td></td>
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<td>Milk Quality: SCC</td>
<td>100k</td>
<td>150k</td>
<td></td>
</tr>
<tr>
<td>Protein</td>
<td>3.5%</td>
<td>3.45%</td>
<td></td>
</tr>
<tr>
<td>Butterfat</td>
<td>4.2%</td>
<td>4.0%</td>
<td></td>
</tr>
<tr>
<td>Nitrogen units per Ha</td>
<td>274</td>
<td>286</td>
<td></td>
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**Figure 1:** *A Balanced Scorecard layout for an Irish dairy farm*

**Delphi Study**

Forty-three experts were initially identified and contracted to participate in the Delphi study. Of these 19 responded and participated in the first round. To provide representative information some studies have employed over 60 participants (Alexander and Kropsi, 1990) while others have involved as few as 15 participants (Burns, 1998). The second round was targeted only at those who had participated in the first round. The response rate in the second round was 89%.

All respondents of the Delphi study were presented with a copy of Figure 1 and asked for their views in the following areas:

- Critical Success Factors (CSF’s) in making better dairy farm business decisions;
- Modifications to the BSC that would increase its utility among Irish dairy farmers, and;
- Training and support that Irish dairy farmers need to get maximum benefit from the BSC.
All three areas that were examined (CSF’s, modifications to the BSC and training & support) generated first round responses ranging from single words to extensive text. Analysis of the opinions expressed by the respondents in the three areas identified key themes, which were grouped under the four perspectives of the BSC. Based on responses from the 19 respondents’ who completed Round 2 of the Delphi study, the ranking statistics for each of the 88 concepts suggested in the study were computed using the Statistical Package for Social Sciences (SPSS). The rating used to indicate the importance of all suggestions to be included in the BSC was a six-point scale with: 6 equating to Very Important, 5 – Important, 4 – Somewhat Important, 3 – Not Important, 2 – Don’t Know and 1 – Not applicable. The non-parametric median and the inter-quartile range were used (rather than the mean and standard deviation) because an ordinal scale was used to rate the concepts. In Round 2 considerable consensus was evident with 88% of responses to the 88 items having overall levels of importance to the BSC of greater than 80%.

Critical Success Factors in making Better Business Decisions

Nearly all of the CSF’s identified in the Financial Perspective were measures of financial performance i.e. Return on Investment and Asset/Debt ratio (median ranged from 4.5 to 6.0). The range of financial performance measures identified could be used as an attachment ‘drop down list’ to the Dairy Farmer Scorecard from which Irish dairy farmers could choose measures of financial performance under the Financial Perspective based on their individual mission statement. This should lead to a focused monitoring of the financial performance of their farm business.

Under the Learning & Growth Perspective the CSF’s, which were identified can be categorised into three broad areas: coping with change (median =6), family issues (median = 5.0) and training (median ranging from 4.5 to 6.0).

Nearly all of the CSF’s included under the Productivity & Efficiency Perspective related to production issues such as grass budgeting (median = 5.0), days in milk (median =5.0) and milk quality – volume of protein, butterfat sold per cow (median = 6.0). The other main CSF’s that were suggested related to ‘monitoring the extent of improvement in key performance factors over the previous two years’ (median = 5.5) and ‘focused monitoring of physical performance’ (median = 6.0).

The CSF’s suggested under the Environment, Regulations & Customers Perspective included: quality of product sold – protein, butterfat, SCC (median = 5.5) - compliance with environment regulations and constraints (median = 5.0), maximise quality assurance and traceability (median = 5.0), complete a safety statement (median = 5.5) and increase the quota per acre (median = 6.0). Irish dairy farmers work in an environment that is governed by strict environmental and safety laws and EU regulations with regards to quota and food safety. These issues influence all decisions made on Irish dairy farms.

Modifications to the Dairy Farmer Scorecard to Increase its Use among Irish Dairy Farmers

The modifications identified for the Financial Perspective of the Dairy Farmer Scorecard were ‘setting goals for cost reduction’ (median =6) and ‘developing an annual cash-flow by month as part of the Dairy Farmer Scorecard’ (median=5.5). The BSC wasn’t developed as a replacement for financial measures but rather as a complement (Kaplan...
and Norton, 1996), and as such it could be very useful if Irish dairy farmers completed an annual cash-flow by month in conjunction with their Dairy Farmer Scorecard. Irish dairy farmers are facing a cost-price squeeze. Therefore, survival in the Irish dairy industry will be based on Irish dairy farmers reducing their costs of production (Brosnan, 2001). However, goals for cost reduction should only be set if the mission statement of the farm family is to reduce the costs of production for their farm business.

Under the Learning & Growth Perspective the modifications suggested to the Dairy Farmer Scorecard related to measuring managerial skills and abilities (median = 5.0). It is necessary in today’s competitive environment that farmers make continual improvements in their existing businesses and have the ability to adapt to changes in the farming industry. This allows farm managers to continue to look and move forward rather than standing still or moving backwards. By measuring their managerial skills and abilities they will be able to determine if they have the infrastructure whereby the financial, environment, regulation and customers, and productivity and efficiency goals might be achieved (Inman, 2000).

Under the Productivity & Efficiency Perspective the modifications suggested to the Dairy Farmer Scorecard to increase its use among Irish dairy farmers included ‘inserting production guidelines on achievable targets’ (median = 5.0) and ‘using specific targets for labour efficiencies’ (median = 5.0). Production guidelines could be attached to the Dairy Farmer Scorecard to allow Irish dairy farmers have access to up-to-date technical information on how to achieve their production targets. Maintaining and optimising the use of labour is one of the major challenges faced by Irish dairy farmers (O’Brien et al., 2001). Specific targets for labour efficiencies could be very useful to Irish dairy farmers, as labour can be a limiting factor for the development of some Irish farms (O’Donovan, 2002).

Under the Environment, Regulations & Customer Perspective the modification suggested to the Dairy Farmer Scorecard was that ‘the mission statement in the centre of the Dairy Farmer Scorecard should be replaced with this perspective as it affects activities in the other three perspectives’ (median = 5.5). Since 1984 milk production in Ireland has been controlled by EU milk quotas, which are expected to remain in place until 2014/15. This allows little opportunity for Irish dairy farmers to expand their dairy enterprise. Also Irish dairy farmers are working under the EU Nitrates Directive, which imposes strict environmental regulations on Irish dairy farmers. Other regulations which Irish dairy farmers must work within include farm safety, food assurance and traceability. Unlike the New Zealand and Australian situations in which the BSC is being developed, Irish farmers do not appear to have the same freedom to farm and must adhere to strict environmental regulations and production constraints.

*Training and Support that Irish farmers need to get maximum benefit from the Dairy Farmer Scorecard*

Under the Financial Perspective the respondents of the Delphi study suggested that Irish dairy farmers attend an ‘initial course of 30-40 hours in relation to farm record keeping, financial analysis, financial planning, goal setting, time management, change, customer/environmental needs, financial management, define the basic efficiency requirements’ (median = 6.0) before beginning to complete the Dairy Farmer Scorecard.
Under the **Learning & Growth Perspective** the Delphi respondents suggested that Irish dairy farmers wishing to adopt the scorecard attend a ‘one-to-one consultation with their advisor’ (median = 6.0). It is necessary that some of the training for the adoption of the Dairy Farmer Scorecard is on a one-to-one basis as each Irish dairy farmer has individual goals and objectives. It was also suggested that helping Irish dairy farmers to unlearn old habits and change their attitude towards farm financial management is an important factor in increasing the use of financial management techniques among Irish dairy farmers (median = 5.0).

Under the **Productivity & Efficiency Perspective** the Delphi respondents suggested that ‘Irish dairy farmers be trained to understand the important drivers of good production performance’ (median = 5.0).

**Dairy Farmer Scorecard**

*Mission Statement: To achieve financial success through the marketing of high quality milk and livestock*

### Learning & Growth

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<tr>
<td>REPS</td>
<td>Join scheme</td>
<td>Join by year end</td>
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### Financial Perspective

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### Productivity & Efficiency

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</tr>
<tr>
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<td>Get set-up</td>
</tr>
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</table>

*Figure 2: Dairy Farmer Scorecard Model*
The Delphi respondents made two suggestions for training and support that Irish dairy farmers need to get maximum benefit from the Dairy Farmer Scorecard under the Environment, Regulations & Customers Perspective. These included: training in environmental issues (median = 5.0) and training in safety issues (median = 5.0). As a result of the Delphi study the Dairy Farmer Scorecard model (Figure 2) has been adjusted to take account of the fact that Irish dairy farmers work in an environment that is restricted by quotas, premia, environmental regulations, safety and other issues etc.

**Discussion and Conclusions**

The term multi-functionality makes it possible to recognise the value of production, while insisting that these values must be weighted against and balanced with other, non-productivist values. The literature and observations reported demonstrated that success in farm management and farm business performance is not uni-dimensional and therefore has no single measurement. Success consists of several dimensions that may or may not be measured in quantifiable terms. This creates a need for interaction between knowledge management and the actions taken by farm decision-makers.

Business strategy is very important to small-to-medium family businesses, as many are both fragile and vulnerable. Strategy provides a solid foundation for survival. Studies have shown that those businesses that do engage in strategic management outperform those that do not so engage. Despite this knowledge the uptake of many aspects of strategic management by farmer businesses has been slow (Byrne et al., 2003). Although the development of business plans is now quite common practice there is often a disconnect between the monitoring that each farm carries out and its business strategy.

**Educational Importance and Implications**

The BSC is a well-established planning tool used in many business sectors. However, the use of financial management techniques and therefore strategic planning tools on Irish dairy farms is low (Byrne et al., 2003). Kaplan and Norton (1996) developed the BSC to integrate strategic plans and their execution through performance measurement and to assist organisational learning. The BSC comprises a mix of lag and lead indicators – in essence lead measures communicate ‘today’ how a farm is likely to perform ‘tomorrow’. An increasing emphasis in organisational learning has been advocated by Argyris (1991), Kreigal and Brandt (1996) and Porter (1997).

How effectively staff, learn new capabilities required to realise strategies is a lead indicator of future business performance. Without a knowledge and understanding of new technologies or better management practice it will be difficult for farmers to make continuous improvement or a transformational change (e.g. trebling herd size to improve profitability and enable succession to children). Even where the base system of milk production remains similar over time, there is a demand for learning with respect to food safety, milk quality, environmental sustainability and animal welfare. Learning should be targeted towards the demand for future growth. One possible way for Irish dairy farmers to ensure that they achieve their strategic goals is by completing a Dairy Farmer Scorecard.
Acknowledgements

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