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PORTUGAL UNIVERSITY INSTITUTES DEVELOPMENT PROJECT

(Contract AID/NE-C-1701)

REPORT ON
SHORT-TERM STAFF ASSIGNMENT

Submitted by
DR. TIMOTHY G. BAKER
Department of Agricultural Economics
Purdue University
West Lafayette, Indiana

June 17-30 and July 7-25, 1985

PORTUGAL UNIVERSITY INSTITUTES DEVELOPMENT PROJECT

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SHORT-TERM STAFF ASSIGNMENT

AT THE

UNIVERSIDADE DE EVORA (UE)

EVORA, PORTUGAL

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ACKNOWLEDGEMENTS

I would like to express my sincere appreciation to those people who made my visit to Portugal so enjoyable. I am especially grateful to Maria do Carmo and Pedro Silveira for their assistance and hospitality. Also, Dr. Ribeiro and Dr. Dordio and others in Evora were excellent hosts.

I am also greatly appreciative to Vivian Rider at Purdue for pleasantly and efficiently handling matters on the Purdue end of the project, including the typing of this final report.

DESCRIPTION OF WORK TO BE PERFORMED

Problem to be Addressed

The University of Evora is presently managing four farms and has a young Department of Management interested in specializing more in agricultural problems. With the farm data collection being undertaken by the Direccao Regional for the EEC - RICA project, substantial farm accounting information will be available for the first time on Alentejo farms. The Direccao Regional has expressed interest in working more with the University of Evora in this project. Moreover, the University of Evora would like to set up a small business center for agricultural firms facilitated by the new computer facilities, which will be available. A senior professor in farm accounting is desired to be able to work with the young professors on curriculum development and on taking advantage of the various new opportunities for obtaining data performing some applied data analysis.

Consultant's Contribution to AID Contract

Bring some experience in farm accounting systems and business analysis and assist in developing the implementation of an accounting system in the university farms. He will work with the faculty of the Department of Management regarding the matters and the teaching of agricultural economics, especially farm accounting.

Specific work to be performed includes:

- Help to develop farm accounting systems for the university farms;
- To continue the work already done in 1983 when Dr. Bache was here for the first time;
- Work with the faculty on research, planning and inter-agehcy cooperation;
- Give two seminars on relevant areas of investigation in the farm accounting/farm management areas;
- Make specific recommendations as to the required equipment skills or other requirements needed to enable a useful accounting system in the universi.' farms;
- Examine the research already done in this area and suggest means and methods that would improve overall results and increase accuracy obtained.

Outputs expected from the visit are:

- Specific suggestions in the area of investigation in farm accounting and farm management.
- Two seminars in the field of farm accounting.
- Report on the accomplished tasks.

Specific skills needed by consultant are:

- Senior Researcher-teacher with publications in the farm accounting area;
- Portuguese speaking ability preferred but not essential.

ITINERARY

June 17 - July 25, 1986

There were substantial differences in the actual daily activities from the preliminary program. Many of the changes were due to the time of year in which professors and students were quite busy with exams and many people begin their summer vacations. Additional changes were due to unforeseen factors and to a shift in emphasis of the work away from the accounting emphasis.

The specific daily itinerary was as follows:

June

17 Departed from West Lafayette.

18 Arrived Lisbon. Met at airport by Dr. Jose Ribeiro, returned to Evora. Met several Evora faculty members and met with Rector Ario Lobo Azevedo.

19 Met more of the management faculty, studied past trip reports of D. Bache and S. James and the final report of John Sanders. Also met with an English class.

20 Had discussions with Jose Ribeiro and Eduardo Couto regarding finance, accounting and computers. Stopped by the computing room, there was no one using the computer. I have the idea that this is common.

In the afternoon I had a meeting with Ribeiro, Couto, Gancho, and Dordio at which I discussed my research program. It is clear that everyone is pretty busy with exams.

21 Met with Conceicao to discuss her teaching program.

June (Cont.)

22-23 Weekend

24 Worked on seminar that I will give on the 26th.

25 Finished seminar notes, including a write-up that will be copied and distributed.

26 Helped with Alberto Rosa's English class again. Gave seminar in the afternoon; attendance was sparce. Met Prof. Antonio Pinheiro, head of the Management and Economics departments.

27 Read a paper by John Sanders on Portugal's entry into the EC. There seems to be surpisingly little research on the topic. Met with the English class again; they take an exam the 28th. Had a chance to talk with Pinheiro.

28 Trip to one of the experimental farms was canceled. I continued to read information available on Alentajo agriculture and tried to determine more specifically what the situation is with respect to accounting or farms in the region.

29-30 Weekend.

July

1-7 Vacation

8 Worked on a list of discussion questions regarding management and economics research. Set a time for next Monday (7/15) to meet with Management and Economics faculty. Worked on my seminar for Friday.

9 Worked on my "Farm Management" seminar, including writing the seminar notes out into text form for duplication. Continued my investigation into accounting on the University farms and farms in general. I have discovered a number of facts, but none seem to necessarily constitute a "problem" in the managerial or research sense.

10 Attended sessions of the "1st Management Meetings," hosted by the Management Department, University of Evora.

11 Attended "1st Management Meetings" and presented a seminar on "Farm Management" (see Appendix B).

July (Cont.)

12 Attended "1st Management Meetings."

13-14 Weekend.

15 Held a meeting with good attendance of Management and Economics faculty to discuss issues surrounding applied research (Appendix C).

16 Worked on seminar paper on new accounting concepts since the trip to the experimental farm was canceled.

17 There were only a very few people available (due to exams, vacations, and unforeseen circumstances) to attend the third seminar so we decided to defer it until the 18th when we will have an informal discussion about accounting.

18 Met with Dordio and Ribeiro. Discussed my seminar paper (Appendix D), farm accounting and possibilities of establishing a small business center for agricultural firms.

19 Edited typed version of my "Farm Management" seminar paper and made plans for next week. Was not able to meet with the Experimental Farms Committee.

20-21 Weekend.

22 Visited a farm supply and olive processing cooperative with Ribeiro and Couto. The cooperative has accounting problems. Also worked on my final report.

23 Visited three of the University experimental farms. Worked on final report.

24 Traveled to Lisbon to visit the AID Mission at the U.S. Embassy.

25 Depart Portugal from Lisbon and arrive back in Indianapolis, drove to W. Lafayette.

PORTUGUESE COUNTERPARTS

My meetings and discussions were almost entirely within the departments of Management and Economics, University of Evora. Dr. Jose Maria Ribeiro was my primary counterpart. I also had significant contact with Dr. Victor Dordio, Dr. Eduardo Couto, Dra. D. Conceicao Gancho, Dr. Jose Carlos D. Zorrinho, Prof. Antonio Pinheiro, and Engo. Pedro Cabral Duarte da Silveira.

ACCOMPLISHMENTS

The three primary accomplishments were as follows:

1) Numerous discussion sessions were held with faculty at the University of Evora regarding accounting programs for farmers and accounting for the University farms. A typical discussion outline is shown in Appendix E. Specific suggestions are contained in this report.

2) Numerous discussion sessions were held regarding the research needs of Portugal, for example see Appendix C. Specific suggestions are indicated later in this report.

3) Two seminar papers were presented and one seminar/discussion paper was circulated. See Appendices A, B, and D.

ANALYSIS OF PROBLEM AREAS

In this section I will discuss some of the general areas in which I feel that decisions or actions can be taken which might benefit agriculture in the Alentejo and further the objectives of the University.

Research Topics and Barriers

There appears to be a great need for applied agricultural economics research. The entry of Portugal into the EC and the resulting price changes (mostly lower farm prices) could have substantial effects in the Alentajo. For example, substantial areas of dryland farming on lower quality soils (which currently include wheat in the rotation) may become unprofitable to farm in this manner and may be converted to pasture.

While researchable problems are numerous and the faculty of Evora appear to be skilled at identifying these problems, the research output is not large. There are several areas to which attention might be given in the interest of increasing research productivity. Some of these are (1) general administrative procedures and financial support for research, (2) computing software and computer training, and (3) incentives for research productivity.

It is a general perception of the Evora faculty that there are a lot of roadblocks to doing research. Some of these involve a lack of financial support for data collection and other research activities. The existence of a constraining budget is not unlike the situation at

Purdue and many other universities. One response is to attempt to acquire funding from outside of the university for research projects. Such an approach might be taken at Evora, but it would be very difficult for individual faculty members, without many contacts or experience at fund acquisition, to take the lead.

It is also perceived that there are a number of road blocks involving day-to-day administrative procedures. The "red tape" at Evora does not appear to me to exceed that at Purdue. However, there may be a difference in predictability. At Purdue, I feel that I understand how and when decisions are made and can expect action on requests within a known (if not short) amount of time. The faculty at Evora appear to perceive greater uncertainty. This uncertainty can have a negative affect on the enthusiasm for research.

The second area that may currently be hindering research activity, and certainly will become constraining as more research gets underway, is computing support and training. Most economics research projects involve the use of computers. The two most important computer uses are to perform statistical analysis and to formulate and solve mathematical programming problems. In general, excellent commercial packages are available. Seldom is it advisory for users to create their own software for these purposes. A very high priority is to provide computing center support of commonly used software. The statistical package SAS and mathematical programming packages MPSX and MINOS are very good and heavily used in Agricultural Economics at Purdue.

A problem that is concurrent with availability of computer software is the computer skills and training of the faculty. If a researcher is familiar with the methodology he or she wants to use on the computer only modest skills are required. However, some minimal training would be quite beneficial.

The final area that might be related to less than desired research productivity is the incentive the faculty face. In essence, it is perceived that those who do a great deal of research will receive the same pay and teaching loads as those who do not.

In a typical economics research project it is likely that more than one-half of the total time spent on the work will be spent writing, revising, and rewriting. This requires a great deal of energy and persistance. Such effort should be rewarded as directly as possible. At a minimum, perhaps faculty who publish scholarly papers covering research, teaching or extension should be rewarded with lighter teaching loads.

As a final note, I perceived some reluctance on the part of the Evora faculty to tackle research questions because of the chance the project would fail. Perhaps this has a cultural bas . However, my own method of dealing with the risk of individual research projects falling through is to carry on many projects simultaneously. Thus the probability of one or more successes is greater than if I were to work on only one project at a time.

FUTURE REQUIREMENTS AND PROPOSED ACTIONS

The problems identified above present a challenge to the University. However, there are a number of steps currently being taken and others that can be considered to address the problems. These will be discussed below:

(1) Faculty Training: Carry out computer training using computer software on research the faculty members have underway.

(2) Incentives: Assign reduced teaching loads to faculty who have greater amounts of written work from research, teaching, or extension. Be liberal with respect to what publications count, but do not count unpublished manuscripts.

(3) Support: a) Improve the communication between decision-makers and faculty; b) provide greater availability of computer software used in Economics research. As soon as possible obtain SAS and MPSX (also possibly MINOS).

(4) Research topics: To provide topics that are more quickly publishable and that do not require sophisticated statistical or mathematical programming computer software. I recommend initially emphasizing descriptive topics. High on this list would be publishing input-output coefficients, enterprise budgets and other information that can be obtained from the records of the University farms.

(5) Farm Accounting: Follow through with the interest of numerous faculty in the area of developing a farm accounting program. Acquire a carefully chosen accounting software package, implement this package on one or more of the Universit farms who want to cooperate. Follow up with growth in the program from this small beginning.

APPENDIX A

Seminar Presented at University of Evora on
June 26, 1985

FINANCING AND MANAGING THE FARM FIRM UNDER INFLATIONARY CONDITIONS

by

Timothy G. Baker
Department of Agricultural Economics
Purdue University
W. Lafayette, IN 47907 USA

Seminar Presented at
University of Evora
Evora, Portugal
June 26, 1985

FINANCING AND MANAGING THE FARM FIRM UNDER INFLATIONARY CONDITIONS

Introduction

The seminar I am presenting has three major sections. The first is a discussion of how to avoid the money illusion of inflation. In the second section, we will discuss aspects of investments that have enhanced importance in a more inflationary environment; and in the third section, we will examine some of the considerations important when using debt financing.

Accurate Information--Avoiding Money Illusion

The essence of my message with respect to accuracy of information is to carefully distinguish the real component of price changes from the purely monetary or inflationary component. This applies to our interpretation of the past and to our thinking about the future. In this section, we will first define some of the important terms--real and nominal. Examples will then be used to illustrate the meaning of real and nominal.

I will be using the term real to describe data over different time periods (e.g., prices, interest rates, income or amounts of money) with the effect of changes in the general price level of the economy removed that is, with inflation removed. Nominal will refer to situations in which inflation has not been removed from the data.

In general, I would recommend that in the managerial decision process one separate the consideration of expected inflation rate from

examining the prospects for future real costs and returns. We have learned from economic theory that inflation should not cause changes in relative prices. This of course ignores rigidities, dynamics, government policies, and the like that may actually exist and cause real price changes. However, our thought process can be one of first considering real factors, then in turn consider any real effects that inflation might induce (e.g., we will examine a cash flow problem later in the seminar).

Examples

In 1970, Portuguese farmers paid an average interest rate of 5.17%. By 1978 the rate had risen by nearly four times to 20.16%. However, the real interest rate had actually fallen (Table 1).

Exactly what is a real interest rate? It is the percentage increase in real purchasing power required to repay a one-year loan including the principal and interest. If one has a loan of 5% interest and no inflation (the general price level remains constant), it will take 1$05 to repay a loan of 1$00, the interest rate is 5% both in nominal and in real terms. If the inflation rate is suddenly increased to 20% and the lender wanted to continue to increase his purchasing power at the rate of 5%, he would have to charge a lot more than 5% interest. He would need 20% more than 1$05 for each escudo to buy the same goods that he could have purchased when there was zero inflation. Thus, the nominal interest rate would be 26%.[1/] The real interest rate is the same at 26% nominal interest with 20% inflation as it is at 5% interest and zero inflation.

Examining the history of interest rates paid by Portuguese farmers

Table 1

Average Interest Rates Paid By Portuguese Farmers
1970 - 1983

Year	Nominal Interest Rate	Inflation Rate	Real Interest Rate
	- - - - - - - - - - - percent - - - - - - - - - - -		
1970	5.17	5.35	- .17
1971	7.06	10.18	- 2.8
1972	7.10	11.28	- 3.3
1973	8.50	13.70	- 4.6
1974	9.40	26.60	-13.6
1975	11.30	17.91	- 5.6
1976	11.85	19.08	- 6.1
1977	16.66	27.40	- 8.4
1978	20.16	22.00	- 1.5
1979	20.16	24.20	- 3.3
1980	20.16	16.60	3.1
1981	22.30	20.00	1.9
1982	24.30	22.40	1.6
1983	28.37	25.50	2.3

Source: Table provided by Victor M. C. Dordio

one can see that nominal interest rates are now at historical highs (Table 1). The real interest rate is also higher than it has been over most of the past 14 years. However, the real rate is low in comparison to many other countries. For example the real borrowing interest rate paid by many farmers in the U.S. is now 8 to 10%.

Prices of goods and money flows should also be adjusted for inflation--converted into real values. This is especially important when the inflation rate is high, as it is in Portugal, or when the data cover a long historical period or, are projected far into the future. I find that we cannot make easy intuitive adjustments. For example, Table 2 shows the amount of credit used by Portuguese farmers from 1970 through 1983. Note that the amount increased from 10123 million escudos in 1970 to 107113 escudos in 1983. Did the amount of credit increase over this period in the sense that the credit extended in 1983 will buy many times the amount of tractors, trucks, cattle, fertilizer, etc.? As it is shown in Table 2, the real purchasing power of the 1983 credit is only slightly greater in 1983 than in 1970. I am sure that many Portuguese have seen their nominal wages increase by many times over this period--but have not had increases in real purchasing power. However, one should not be quick to attribute real wage decline to inflation. Rather, one should look to real economic factors as the reasons for real wage declines.

Real prices and dollar flows always have a base or reference period. In Table 2 the right two columns are the same except one is in the 1970 level of general prices and the other is in the 1983 general price level.

Table 2

Total Credit Extended to Portuguese Farmers
1970 - 1983

Year	Nominal Amount of Credit	Real Amount of Credit in the 1970 General Price Level	Real Amount of Credit in the 1983 General Price Level
	- - - - - - - - - - - - 10^6 Esc. - - - - - - - - - - - - -		
1970	10,123	10,123	87,352
1971	11,166	10,598	91,451
1972	13,524	11,651	100,538
1973	17,305	13,397	115,604
1974	20,948	14,263	123,077
1975	22,487	12,094	104,360
1976	26,462	12,070	104,153
1977	31,601	12,107	104,473
1978	29,052	8,737	75,392
1979	46,786	11,532	99,511
1980	65,666	13,032	112,454
1981	77,337	13,163	113,585
1982	89,489	14,112	121,774
1983	107,113	12,413	107,113

Source: Table provided by Victor M. C. Dordio

The Bias of Accounting Profit

A popular belief among accountants, economists and financial analysts is that traditional historical cost accounting overstates profit when there is inflation. Their reasoning is that depreciation charges are too small because they do not reflect replacement cost, and that "inventory profits" should not count. The latter is based on the idea that the inventory must be replaced at a higher cost. However, in fact there is not a consistent overstatement of profit!! Offsetting the two factors mentioned is usually an increase in the value of assets, sometimes called capital gains. The relative effect of capital gains is greater the longer the lives of assets on the balance sheet.

Farmland, an asset with nearly perpetual life, is dominate among the assets of most U.S. farmers. Even with a relatively low inflation rate the effect has been to underestimate income to such a degree that major changes in accounting are occurring. Namely, market value accounts are being used in addition to historical cost accounts. Again, the motivation for the change is highly related to a brief stint of inflation that peaked at 10% and is now under 5%.

Investment Choice Under Inflation

Overall, inflation has little effect on ones choice of investment relative to traditional considerations such as profitability, risk and technical managerial considerations. However, one aspect merits mentioning. When possible one should choose investments whose products are sold in markets which allow adjustment as the general price level

changes. Fixities might occur due to government regulations, (price controls by contract, (such as fixed interest bonds) or due to the nature of the market dynamics (e.g., custom or tradition may result in slow change).

In general, it has not been proven that assets such as art, gold, or other so-called inflation hedges have any advantage over productive income producing assets. For the most part, investments that would be a good choice without inflation would be a good choice with inflation.

The Financing Decision Under Inflation

The financing decision of most noncorporate businesses comes down to the issues of how much should the business borrow (leverage) and which among the types of loans that are available should be chosen. The most important aspects of these decisions, risk and liquidity, will be discussed only indirectly as we focus on the effects of inflation.

The two major considerations we will discuss are the correlation of interest cost and returns to an investment, a risk consideration, and cash flow difficulties induced by inflation.

Interest Cost and Returns to Investments

One can draw on the basic concept of diversification to deduce that one might have lower risk by choosing loans such that if the nominal interest rate of the loan would be high, there would be a large probability of high nominal returns to investments. Inflation is a factor that would cause interest to be high and returns to grow.

Long-term (multiple year) fixed interest rate loans are not generally available to farmers in Portugal as they are in the U.S. Such loans have interest cost with a low correlation with investment returns. These loans are cheap, ex post, when unanticipated inflation occurs and are expensive when anticipated inflation does not occur. While there may be situations in which fixed interest rate loans would fit well, one would expect the types of loans available in Portugal to have less risk when combined with investment returns that are likely to increase with inflation.

Inflation and Cash Flow Difficulty

When the inflation rate is high, just meeting loan payments on debt financed investments can be difficult or impossible in the early years of an investment's life. This can be true even though the real interest rate may be low and the investment profitable. An example will illustrate the point below.

Assume that you can purchase an asset that you believe will provide net returns of 100,000$/yr. (in the 1985 general price level) and will last 10 years. Further, assume that you see no reason for inflation to increase or decrease the real returns. If you expect the nominal interest rate to be 28.37% and inflation to be 25.5% (the 1983 levels), this would give you a real interest rate of 2.3% and the present value of the returns would be about 884,000$. Let us assume that you can buy the asset for 800,000$ and that you borrow 800,000$ for the purchase. At this price, the investment is profitable and depending on the riskiness and your other investment opportunities you may want to purchase this asset. With no inflation the interest rate would be 2.3%, the

returns 100,000$/year and loan payments of 90,465$/year will pay interest and fully amortize the principal.

However, the inflation rate is 25.5% not 0%. Even though the inflation increases the first year's return to 125,500$, the interest in the first year is 226,960$! In Table 3 we can see what would happen over the life of the investment if we have a very patient banker who is willing to accept payments on the loan as money is available and add any cash short-fall to principal. As you can see, eventually the investment pays off the loan, but only after the principal balance has grown to 145% of the initial principal.

The cash flow problem is, in some sense, money illusion, although it is an illusion that is very real to farmers trying to meet interest payments. The shroud of money illusion can be removed by converting the remaining principal balance on the loan into constant or real escudos (Table 3, right hand column). In real money the principal continually declines even though the nominal principal grows.

The above example vastly overstates the cash flow problem because cash flow is a whole business concept. One should not look at the cash flow of just one investment, rather we should look at the cash flow for all investments collectively. The above example would apply to a whole business only if the business was financed with the same percentage of debt as the investment in the example. Clearly, 100% debt is far too much for a farm business which is subject to price and production uncertainties. However, an important question is, does the inflation induced cash flow stress significantly reduce the amount of money that farmers choose to borrow below that which is prudent based upon noninflation risks and liquidity considerations. I do not know

Table 3

Cash Flows and Principal Balances for Example Investments

Year	Nominal Returns	Interest at 28.37%	Net, After Interest	Principal Owed	Price Index	Real Principal Balance
0	-	-	-	800,000	1.000	800,000
1	125,500	226,960	-101,460	901,460	1.255	718,252
2	157,503	255,744	- 98,242	999,702	1.575	634,721
3	197,666	283,615	- 85,949	1,085,651	1.977	549,236
4	248,070	307,999	- 59,929	1,145,580	2.481	461,741
5	311,328	325,001	- 13,673	1,159,253	3.113	372,391
6	390,717	328,880	61,837	1,097,416	3.907	280,885
7	490,350	311,337	179,013	918,403	4.903	187,315
8	615,389	260,551	354,838	563,565	6.154	91,579
9	772,313	159,883	612,430	(48,865)	7.723	-
10	969,253	-	-	-	9.693	-

the answer to this question, but would like to hypothesize some situation in which it does.

One important situation is when one makes an investment that is large relative to the size of their portfolio. The lumpiness of investments may contribute heavily to these situations. This may occur more often on smaller farms making even modest sized capital investments or on bigger farms making large investments.[2/]

Reduced farmer borrowing due to cash flow stress may come in conflict with public policies intended to expand agricultural investment and production. Credit policies, such as reduced interest rates and special programs to make credit available to more farms, are often used in developed and developing countries. The effectiveness of these policies may be reduced under high inflation unless credit institutions accommodate the potential cash flow problems illustrated above.

Footnotes

1/ Calculated as 1.05 x 1.20 - 1.0 = 0.26

2/ And for university graduates buying automobiles or university professors buying housing.

APPENDIX B

Seminar Presented at the University of Evora on

"Farm Management"

FARM MANAGEMENT

by

Timothy G. Baker
Department of Agricultural Economics
Purdue University
W. Lafayette, IN 47907 USA

Seminar Presented in the
"First Management Meetings"
University of Evora
Evora, Portugal

FARM MANAGEMENT

Introduction

An important question that will allow us to get into a discussion of farm management is, "What is good farm management?". I propose that good farm management is effectiveness at executing the managerial process. Being effective at this process will result in getting the right thing done at the right time. Key ingredients here are rational choice, action, and timeliness.

In this seminar I would like to examine the managerial process and discuss the steps involved. Hopefully, this might provide a framework for thinking about things we can do to improve our management.

The Managerial Process

A breakdown of the steps in the managerial process is shown in Figure 1. The first step, problem identification, is of critical importance and will be discussed at length in the next section. Clearly, to initiate the process leading to a decision, the manager must perceive a problem or need for a decision. Very often problems take the form of a difference between a manager's concept of what is (or will be) and his concept of what ought or ought not to be.

A good deal of information about facts, values, and preferences is needed to identify many problems, but in most cases further observation, the second step, is needed. This step includes gathering relevant data. Observation does not need to be passive as our

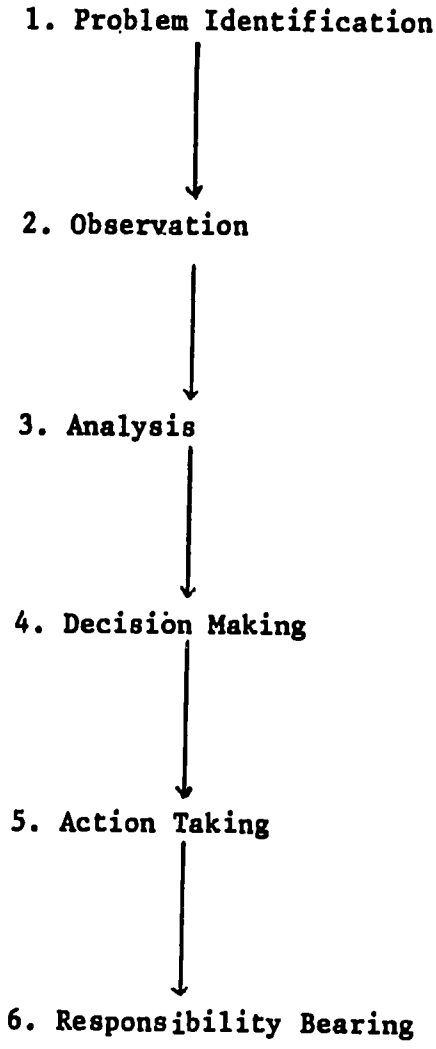

Figure 1

Steps in the Managerial Process

label might suggest. One of the differences among managers is the perceptiveness with which they observe what goes on around them and the persistence with which they pursue information. There is probably a good deal of refining and redefining of the problem as observation occurs.

The third step, analysis, is where management and economics courses spend a lot of time. Clearly, the intuitive and quantitative types of analysis are both important. Analysis of most problems requires the use of both inductive and deductive reasoning. With inductive reasoning one infers a proposition from experiences or observation--a new variety of wheat has a high yield for my neighbor, it probably is a good idea for me to try the new variety.

Deductive reasoning is reaching a conclusion from what is known to be true. For example, my cost of growing and harvesting olives exceeds the returns I get when the olives are sold, I prefer to have a smaller loss, therefore I probably should reduce or eliminate olive production.

Use of experience, observation, budgets (cost and return data), marginal analysis, and plans are all important in the managerial process. As in other steps, there is normally a good deal of interaction between analysis and observation.

Good managers know when to reach decisions, the fourth step in the decision process. Many people are not good at making decisions. They either continually analyse (the paralysis of analysis) or repeatedly iterate between analysis and decision-making, making the same decision over and over.

Decisions can be positive, a decision to take an action, or negative, a decision to not take an action. The ability to make both types of decisions is important. It is also important to know when it is time to make a decision. This will be discussed more in a later section called "Knowledge Situations."

After a decision is made a manager must have the conviction to take action, the fifth step in the process. While some poor managers have difficulty taking any action, some find it easier to take positive action than negative action. Inefficiencies often result when a negative action decision is implemented by doing nothing until it is too late. This type of management is particularly poor when it involves employees.

After taking action, someone must follow-up with responsibility for the actions to be effective. In most cases this means following up with evaluations such as financial evaluations. Examining past performance can help us refine and improve our managerial skill.

In the next two sections we will discuss two aspects of the decision process that I think are very interesting. These are problem definition and knowledge situations. Problem definition is one of the most intangible, elusive, and important parts of the process, and this merits our attention. The section on "Knowledge Situations" will attempt to help us organize our thoughts as to when decisions should be reached. A final section will be a discussion of some strategies for improving management.

Problem Identification

The identification of problems is probably the most important part of the managerial process. Interestingly, the better farm managers (as measured by degree of profitability) perceive themselves to have more problems than less profitable farmers. It is probably the case that the less profitable farmers simply are less aware of what is happening in their operation or less aware of what results they could achieve.

As indicated early, the major class of problems can best be described as situations in which an existing or eminent situation is not what the manager thinks it ought to be. This may come about in a major way--e.g., the farm is losing money or a loan cannot be repaid. Or, it may come about as simply an idea for a possible improvement. Such ideas may be sparked by seeing or hearing about something new or by an event such as weather, a new government policy, or an accident.

One way in which many managers assist the problem identification process is to have well spelled out goals. Failure to achieve these goals may indicate a problem.

Two other classes of problems are related to the first type. One may have unreliable knowledge of the present state of affairs and one usually needs to formulate beliefs about the future state of affairs if various alternative actions are or are not carried out. Thus, one needs good and reliable knowledge of the present, and projections of the consequences of actions.

Clearly, one needs a good set of farm records of all important and easily quantifiable results. Things not so easily quantified are also important! However, this is no justification for failure to keep

accurate records of the easily quantified outcomes. Further, planning and budgeting can be an important part of the solution to the problem of identifying the potential consequences of actions.

Heavy reliance on tradition and the lack of continual and vigorous pursuit of knowledge regarding new technologies and new price relationships may be areas of poor problem identification among Portuguese farmers. Tradition can play an important role in many decisions. However, technology moves very fast. The last to adopt new technology usually do so not just because it is more profitable but because they must to survive. Furthermore, prices of products and inputs sometimes change significantly and dictate changes in the farm operation. Good managers quickly, if not happily, adapt to the new price relationship.

Knowledge Situations

As one proceeds through the managerial process, there are different situations that one can be in with respect to the degree of knowledge. We have categorized these into two major categories. The first is when the decision-making step is being delayed, and the second is when decisions are made. These each have three categories which are detailed below.

I. Delayed Decision

   a) Learning Situation: There is insufficient knowledge to take the risk involved with a decision and the value of added information is expected to exceed the cost of acquiring additional information. Thus, one rationally chooses to continue learning.

   b) Inaction: There is insufficient knowledge to take the risk of action and the cost of information exceeds the perceived value of the information. Thus, one has inaction.

c) Involuntary learning: An outside force causes learning to occur in a situation that would otherwise be in another category.

II. Decisions Made

a) Certainty: Perfect knowledge of the situation exists and a decision is made. The decision can be positive or negative. This knowledge situation seldom occurs.

b) Risk Action: Sufficient information has been acquired to take the risk of a decision. The decision may be negative or positive.

c) Forced Action: Something outside forces a decision when you would otherwise be in some other knowledge situation.

The knowledge situations described above recognize that learning can take place and occur sequentially. Furthermore, information has a cost and is not always worthwhile. Finally, risk is inherent in decision making. Our goal is to acquire sufficient information such that we can make a decision (positive or negative) considering the risks involved.

Efficiency in acquiring information (i.e., low cost) may be a key difference among managers. One aspect of the cost of information coincides with the passage of time. One can sometimes acquire information by waiting. However, this often has a high cost in terms of opportunities that are lost. Managers who can acquire information that substitutes for the passage of time often are the more profitable early adoptors of new ideas.

Strategies to Improve Management

The following is a listing of some practical ways in which one can take actions to improve your efficiency in the managerial process.

1. Keep better records. This is not always more records, it may be different data or simply better record summaries.
2. Explicitly define and write down goals. This can help one focus their management time on problems most directly related to what they feel is important--their goals. Goals should include both financial and nonfinancial items.
3. Continually seek education and new and better knowledge of what can be accomplished. This should include experimenting, trying new things on a small scale.
4. Peer group evaluation or comparative analysis of record data. One method of having a point of reference (of what can be) is to see what others accomplish. This can be done by comparing your records to records of similar farms/businesses.
5. Take time away from day-to-day, minute-to-minute action to contemplate the big picture. This may involve getting completely away from the business location.
6. Give explicit and conscious thought to being a manager. Motivate yourself to give your best efforts to management.
7. Do projections, forward planning, and compare actual results to the projections. Early problem identification can save money. One of the few tools for early detection is financial projections and comparisons. Deviations do not always indicate a problem--in fact they may only occasionally indicate a problem. However, this is often sufficient to make the effort profitable.

Summary

My goal has been to provide a framework for thinking about management and to provide some food for thought. I hope I have been succesful.

APPENDIX C

Discussion Questions Regarding Applied Agricultural Economics Research in the Departments of Management and Economics, University of Evora

July 15, 1985

DISCUSSION QUESTIONS REGARDING APPLIED AGRICULTURAL ECONOMICS RESEARCH IN THE DEPARTMENT OF MANAGEMENT AND ECONOMICS UNIVERSITY OF EVORA

Timothy G. Baker

July 15, 1985

1. What problems (researchable questions) are most important to Alentejo agriculture?

   - We might note that there are probably research questions related to firm level cost efficiency, enterprise selection, and profitable investment as well as policy issues related to the lack of growth in total agricultural production.

2. What is the intersection of research problems with the skills and time availability of the researchers?

   - See table on types of applied research.

   - Are there one or two areas you can build a reputation around?

3. What are the highest priority self-improvement areas with, respect to research skills, for the Management Department faculty?

   - Computer Usage

     High Priority: Statistics and data base management
     Spread sheet usage

     Medium Priority: Linear programming
     Word processing

     Lower Priority: Programming Language (e.g. BASIC)

4. (a) What are sources of funds for research?

   (b) What are the incentives and rewards for research?

5. How does one best handle the risk of failure?

6. What is the situation with respect to data for Economic Research?

   Primary data collection is expensive
   Secondary data are in short supply and not real accurate
   Farm record data?
   Experimental data on new technology?

7. Applied research is often interdisciplinary!!

8. How does one compensate for, or maybe take advantage of, the lack of a farm background?

9. There is a need for individuals to view the collection of their teaching and research as a focused and integrated program!!

10. What are the most effective methods of communicating applied research results?

    Can you foster and create demand from farmers for farm management/accounting/finance/marketing information?

TYPES OF APPLIED RESEARCH

Category	Nature of Objectives	Research Methods Commonly Used	Examples
I. Generally or Purely Descriptive	Usually have objectives related to informing an audience about existing circumstances, situations, outcomes, or opinions.	Arithmetic calculations (Means, % changes) Trends Surveys Statistics (esp. for sample surveys) Budgets Discounted cash flows	"Agricultural credit in Portugal: It's Use and Management." Dordio and Zorrinho. John Sanders paper on Portugal entry into the EC.
II. Descriptive but with a specific hypothesis	Objectives can usually be stated in the form of fairly specific questions such as what factors caused _____ to happen? Or what are the important factors . . . . .? Or what is the effect of . . . . . ?	-Normally require a fairly specific theoretical model and quantitative analysis. -Econometric Models Sometimes it's dead largely with estimated coef. Sometimes S & D eqns. in a simulation model. Computer factual simulations Forecasts or projections "What if?" simulations -Math programming -Other types of system simulation models	I believe I have seen reference to LP work by Maria Gabriela Silva
III. Prescriptive Studies	Primary objective is usually a fairly explicit question regarding the best action or policy for a given audience with respect to a problem faced by that audience.	-Very specific theoretical model combined with optimization. -In firm level analysis usually a mathematical programming model of some type. -Some prescriptive models are developed for use by farmers.	-Least Cost Feed Rations -Optimal Machinery Selection -Optimal Enterprise Selection

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APPENDIX D

Seminar Presented at the University of Evora on

"Developing New Accounting Concepts for
Farm and Agribusiness Firms"

July 17, 1985

DEVELOPING NEW ACCOUNTING CONCEPTS FOR FARM AND AGRIBUSINESS FIRMS

by

Timothy G. Baker
Department of Agricultural Economics
Purdue University
W. Lafayette, IN 47907 USA

Prepared for Presentation
July 17, 1985
University of Evora
Evora, Portugal

DEVELOPING NEW ACCOUNTING CONCEPTS FOR FARM AND AGRIBUSINESS FIRMS

Introduction

In this seminar I will present a brief discussion of accounting theory which will provide a framework for discussing market value acccounting. This will be a very limited discussion of new accounting concepts and very definitely will not cover areas such as new computer software. However, I feel this topic is of potential importance due to the high rate of inflation in Portugal.

Accounting Theory

I believe that new concepts in a discipline should be introduced as adjustments to the conventional theoretical framework whenever this is possible. Accounting theory is not well specified in the sense of being logically deduced from axioms. However, the following assumptions and general principles capture the essence of accounting theory. A brief explanation is provided with each assumption and principle.

A. Basic Assumptions

1. Economic Entity: The activities of a "unit" can be kept separate from other activities of the owners and from other businesses. In many cases of sole proprietorships this means that the identifiable entity might have to include some nonfarm and family activities of the owners.

2. Going Concern: The accounting entity is treated as if it will always continue in operation. Some accounting conventions, such as depreciation, are more justifiable under this assumption.

3. Monitary Unit: The monitary unit must remain reasonably stable. It is my view that even modest inflation rates of 5 to 10 percent violate this assumption sufficiently to justify the modifications to traditional accounting explored below.

4. Periodicity: It is assumed that the full functional life of a business's investments will have to be divided into artificial time periods to provide useful information.

B. Basic Principles

1. Historical Cost: The advantage of cost over other valuations is that it is definite and determinable. In many instances this is true. In many others, e.g., allocation of fixed costs for the purpose of determining the cost of goods in process or inventories (stored grain, growing wheat), this is far from true.

2. Revenue Realization: Earnings are not recorded until the earnings process is complete and an exchange transaction has occured. In the modifications proposed below, it is suggested that unrealized earnings be recorded--earnings for which the process is not complete or no transaction has yet occured--but be identified separately from realized earnings.

3. Matching: Costs are matched with the revenue generated by the cost.

4. Consistency: Treat similar events the same from period to period.
5. Full Disclosure: This includes disclosure of items that may not appear as assets or liabilities on the Balance Sheet.
6. Objectivity (verifiability): The ideal of the objectivity is that accountants with similar information would report similar financial accounts.

Discussion

The assumption of periodicity, while an essential aspect of practical accounting, is what prevents a more rigorous theoretical framework. I believe that net present value, or other time-value-of-money based models is an appropriate theory upon which to consider changes in accounting method. With a constant monitary unit, historical cost accounting is a reasonable approximation of an annualized net present model. I will demonstrate below that with high inflation it is not. Accounts can show negative earnings, when in truth a profitable operation is underway.

We will first examine accounting for an asset with infinite life, such as land. Then we will examine an asset with a shorter life.

Assets with Infinite Lives

Assume an asset with an infinite life and real returns that are constant at $\$A_o$/yr. If we allow for inflation at rate I, then the nominal returns in year t will be:

$$A_t = A_o (1 + I)^t \qquad (1)$$

If we assume a real discount rate of r*, the nominal interest rate (r) will be:

$$1 + r = (1 + r^*)(1 + I) \tag{2}$$

The present value of this asset at time zero (P_o) is:

$$P_o = \sum_{t=1}^{\infty} A_t(1 + r)^{-t} = \sum_{t=1}^{\infty} A_o(1 + I)^t (1 + r)^{-t} =$$

$$\frac{A_o}{r^*} \tag{3}$$

At time 1 the value of the asset is:

$$P_1 = \sum_{t=1}^{\infty} A_1(1 + I)^t (1 + r)^{-t} = \sum_{t=1}^{\infty} A_o(1 + I)(1 + I)^t(1 + r)^{-t}$$

$$= \frac{A_o(1 + I)}{r^*} = P_o (1 + I) \tag{4}$$

After t periods the value is:

$$P_t = P_o (1 + I)^t \tag{5}$$

Now, our accounting problem with this asset is one of wanting to know how profit is coming along without waiting for the infinite period to expire to see how things work out. We can use the above results which describe the asset's value--which we will assume to be the asset's price--and what should happen to the asset in terms of value and returns over its life.

As accountants, we would like to record the realized income, A_t, as it accrues and if borrowed capital is used, we will want to deduct this as an expense. If borrowed capital is not used, or actually, to the degree it is not used, we will examine the rate of return on

equity to judge our degree of profitability.

We can annualize the NPV model of equation (3) to get the following equation for net profit in year t (N_t).

$$N_t = A_t + P_o(1+I)^{t-1} * I - P_o(1+I)^{t-1} * r, \quad t=1,\ldots,\infty \qquad (6)$$

Where $\sum_{t=1}^{\infty} N_t (1+r)^{-t} = P_o$

It is interesting to study the three terms on the right side of equation (6). The first term, A_t, is simply the realized net earnings before interest. The second term is the value of the asset at the beginning of the year times the rate of increase in the asset's value. Thus, the second term is the (unrealized) capital gain during the year. The final term is minus the interest rate times value of the asset at the beginning of the year.

Conventional accounting works fine with I equal to zero. The middle term drops out, and the nominal and real interest rates are the same. Interest is charged on the whole amount (P_o) in the equation, whereas, in accounting only the debt financed portion is deducted. This causes no harm since the profit from accounting will probably be divided by the net worth of the firm and compared to r.

When inflation is nonzero, large distortions can result. If inflation is 10%, and real interest 3%, the nominal interest rate is 13.3%. When t = 1, what is accounting profit, assuming the asset is purchased for P_o and was 100% debt financed? In other words what is the size of A, relative to $r*P_o$. From equations (1) and (3) we can see that $A_o = r^* P_o$ and that $A_1 = A_o(1 + I)$. In our example A_1 is

1.1 x .03 P_o, or .033 P_o. The term r P_o is .133 P_o. Thus, the accounts will show that we have lost money in an amount equal to 10% of the asset's purchase price. However, the correct profit, equation (6), indicates that we should add in the capital gains, of 10% in this case. Thus, an accurate accounting might report a realized loss of 10% and an unrealized gain of 10%.

An Asset with a Finite Life

Results similar to those above can be demonstrated with an asset with a finite life. Let us use the asset from my first seminar on "Inflation Considerations in Farm Financing and Management."

First, we will need to determine a reasonable basis for the example asset's market value over its 10 year life. In Table 1, we have the year t discounted values of the asset's remaining income stream, multiplied by 90.5 percent. The 90.5 percent reflects the discount from the present value of the income stream that we initially assumed that the asset could be purchased for.

Using data from the earlier seminar and Table 1, we can examine the results of cost basis accounts and compare these with the market value accounts that I am suggesting.

The initial balance sheets would look like the following:

BALANCE SHEET AT TIME 0

Assets			Financing		
Item	Cost	Market	Item	Cost	Market
Asset	800,000	800,000	Debt	800,000	800,000
			Net Worth	0	0

Table 1

EXAMPLE ASSET REMAINING VALUES

Year	Value*
0	$ 800,000
1	913,559
2	1,030,405
3	1,144,080
4	1,244,424
5	1,316,030
6	1,336,145
7	1,271,836
8	1,189,582
9	754,949
10	0

*Remaining returns after year t discounted to year t, multiplied by .905.

In the initial year the income would be as follows:

INCOME STATEMENT FOR YEAR 1

Earnings before interest and depreciation	125,500$
Interest	-226,960$
Depreciation*	- 80,000$
Net Income	(181,460)$

*10 year life, straight-line with 0 salvage value.

The income statement shows a hefty loss. Let us prepare the end of period balance sheet.

BALANCE SHEET AT TIME 1

Assets			Financing		
Item	Cost	Market	Item	Cost	Market
Asset	720,000	913,559	Debt	901,460	901,460
			Net Worth	(181,460)	12,099

As you can see, the cost basis accounts show a large decline in net worth--negative retained earnings, while the market value balance shows an increase in net worth.

We suggest the following additional statement of income.

CHANGE IN UNREALIZED INCOME DURING YEAR 1

Unrealized income at end of Year 1		193,555$
Market value of assets	913,555	
Less cost basis of assets	-720,000	
	+193,555	
Unrealized income at the beginning of Year 1		0
Market value of assets	900,000	
Cost basis of assets	900,000	
	0	
Change in unrealized income		193,555$

This additional income statement indicates that although there was a realized loss of 181,460, there was an increase in unrealized gains of 193,555. Thus, we can reconcile the change in market value net worth.

CHANGE IN MARKET VALUE NET WORTH

Retained earnings (change in cost basis net worth)	(181,460)$
Change in unrealized income	193,550 $
Change in market value net worth	+12,099$

In the true, net present value, sense of profit, this investment was profitable. The cost basis accounts alone did not reflect this. Both sets of accounts are needed for a complete and unbiased estimate of profit.

APPENDIX E

Accounting Issues -- Farm Record Issues

APPENDIX E

Accounting Issues -- Farm Record Issues

I. Notes for discussing farm accounting with Dr. Dordio and Dr. Ribeiro

A. Initial data recording is an issue--forms, codes, etc,
   1. Transactions
   2. Stocks
      Inventories of physical assets (and their value) and financial assets

B. Exactly what data to record
   Primarily a question of what kind of reports are going to be generated, which should depend upon what reports will be valuable to the farmers

C. Processing of transactions data
   1. How much is done by farmers
      Who does the rest of the data processing
   2. What kind of processing system will be used
      a) computer program
      b) other
   3. Will the system conform to the official accounting plan
      Will it be single or double entry

D. Exactly what reports will the farmers receive (prepare)
   1. Monthly--annual
   2. Financial reports
      a) profit (Inc. st)
      b) balance sheet
      c) etc.
   3. Enterprise analysis
   4. Comparative analysis

E. What assistance and from whom will the farmers receive in collecting and using their data
   - fieldmen
   - University
   - Others

F. Can the system be organized into a set of logically progressive steps so that farmers can start at a basic level and advance without completly changing their accounting system?

G. Can something be implemented that incorporates the gross margin idea?
   1. It seems to me like the gross margins are quite similar to enterprise accounts without allocation of fixed costs
   2. I have some concern about using the cost accounts that I have seen for managerial use
      i. charges for capital
         corn grown on rented land costs more than owned land
      ii. exchanges between enterprises
   3. Definitions of "activities" is not going to be easy

H. How should the system begin in order to get some of the problems ironed out
   - University farms
   - Other farmers
   - RICA
   - Other

I. What role should the University of Evora take?

II. Issues related to the current record keeping systems on the University farms.

A. A number of facts seem to surface but none appear to constitute a problem that is not well within the capabilities of University of Evora people to solve.

B. It appears that the financial data are not 100% complete, therefore financial reports are not complete. This is a problem only if decisions or publications need complete financial data. Much useful farm management data can be produced from incomplete records data. Also, solutions to the incomplete data problem are well known, only implementation is lacking.

C. It is surprising to me that the farm managers and overseeing boards do not insist on having audited financial records. This would leave no risk of later having questions raised about the financial aspects of the farms.

D. Clearly there is a great deal of useful information in the records of the University farms waiting for publication in sources available to farmers.

E. There are some inconsistencies in records across the University farms. This prevents some types of analyses using the various farms as cross-sectional data. The value of questions that could be addressed with consistent data should be weighed against the cost of changing the systems. Perhaps this will not have a high Benefit-Cost ration until the Evora faculty are publishing studies using the data that are available.

F. The current reports may not be refined sufficiently to be useful to managers. The solution to this problem would be best resolved by involving the managers in the process of selecting and implementing new accounting systems so that they could see the potential use of the more refined accounting system.