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Book Reviews

Books for review are to be sent to the Book Review Editor Arne Sandström, Statistical Research Unit, Statistics Sweden, S–115 81 Stockholm, Sweden.

Bloomfield, P. and Steiger, W. L., Least Absolute Deviations: Theory, Applications and Algorithms. Progress in Probability and Statistics, Vol. 6, Birkhäuser Boston, Inc., Boston, 1983, ISBN 0-8176-3157-7, xiv + 349 pp., $24.95.

This book is a monograph on least absolute deviations (LAD) in linear models. The presentation is mainly intended for researchers in statistics and numerical analysis, but could also be valuable for researchers in economics and operations research. It is assumed that the reader has a good knowledge of modern mathematics and statistics. As the title suggests the book is divided into three parts: Part 1 deals with the theory, including Monte Carlo experiments, Part 2 deals with applications, and Part 3 deals with algorithmic considerations.

LAD is the L_1-norm analogue to least squares (LS). To clarify let us look at the following example.

Given n points $(x_i, y_i) \in R_2$ to which we try to fit a straight line $y = b_0 + b_1 x$, the general L_p-norm solution is found by minimizing the distance function

$$f_p(b_0, b_1) = \sum_{i=1}^{n} |y_i - b_0 - b_1 x_i|^p .$$

If $p = 1$ we get the LAD solution, for $p = 2$ we get the ordinary LS solution and in the limit, as p goes to infinity, the distance function becomes

$$f_\infty(b_0, b_1) = \sup_{1<i\leq n} |y_i - b_0 - b_1 x_i| .$$

As we can see from the distance function LAD is less sensitive to extreme deviations than LS. This is the main reason for using LAD instead of LS in situations where we want to avoid giving too much influence to a few extreme deviations. It is also known that if the errors follow a double exponential law, LAD will give the maximum likelihood solution.

Chapter 1 gives a brief historical survey of the subject. It also contains a mathematical background which among other topics deals with uniqueness and optimality. The next chapter deals with LAD in linear regression. Statistical properties like strong consistency and limiting normal law are established for LAD estimators. The chapter also discusses robustness of LAD in terms of the breakdown point and the influence function. Finally, there is a small Monte Carlo experiment that elucidates some of the sampling properties, especially as compared to those of other familiar estimators including LS. Chapter 3 is the analogue of Chapter 2, but deals with stationary autoregressive processes.

Chapter 4 is devoted to one- and two-way layouts. The statistical properties established in Chapter 2 are also valid here. The chapter ends with a discussion accompanied by examples on the relationship between LAD and median polish in two-way tables.

Chapter 5 deals with the use of LAD in fitting spline functions. Two examples, one on real data and the other on simulated data, are included in the chapter.

Chapter 6 discusses linear programming (LP) problems and their connection with LAD fitting. It is shown that any LAD curve-fit may be expressed as an equivalent bounded, feasible LP problem, and vice versa. This provides the means of expression for statements about LAD. For example, Khachian's famous finding that the LP problem is polynomial is also valid for LAD. Chapter 7 describes and compares three special purpose LAD algorithms. The three algorithms were compared over a variety of problems. Some of the problems were deterministic and some were random; in the latter case the coefficient of a regression model was estimated. In my opinion the most promising of the three algorithms for LAD fitting seems to be Bloomfield-Steiger's. It is unfortunate that no program codes for the algorithms are supplied.

Each chapter concludes with a discussion of possible future work and a section of Notes. The Notes include material somewhat marginal to that covered in the chapter. The Bibliography contains about 150 titles and is up to date. I agree with the authors that there is a need for a standardized treatment of LAD techniques as they apply to various areas in several domains. The present book both satisfies this need and gives a comprehensive bibliography of the research in this area. A shortcoming is that some of the Monte Carlo experiments use too few replicates, especially in Chapter 3, making the small sample results rather unreliable. Another shortcoming is that more examples, based on real data, are needed.

Despite its shortcomings, the book is of great value to researchers in statistics who are interested in alternatives to least squares in linear models and researchers in operations research working on linear programming.

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Cox, D. R. and Oakes, D., Analysis of Survival Data. Chapman and Hall, London, 1984, ISBN 0-412-24490-x, viii + 201 pp., $30.95.

Ever since the well-received paper by Cox (1972), there has been accelerated activity in the field of survival analysis. Around 1980 the first textbooks appeared, e.g., Kalbfleisch and Prentice (1980), Miller (1981) and Lawless (1982), but it is with great excitement one reads the present book by Cox and Oakes. According to the preface, the book is written for both the applied statistician and a wider statistical audience that wants an introduction to the field. The book does not deal with special methods associated with the fitting of a particular distribution. Martingale and counting process theory is omitted, as is the theory of point processes.

Chapter 1, "The Scope of Survival Analysis," outlines the preliminaries in a nice way. Three important requirements for determining failure time are stressed: the time origin, the proper scale for measuring time, and the clear definition of failure time. The concepts of right censoring and left truncation are introduced. The importance of allowing censoring is obvious for those who are familiar with survival analysis, while the need for left truncation perhaps demands an explanation. For example, in a study of the effects on mortality of occupational exposure to agents such as asbestos, the natural measure of time is age, since this is a strong determinant of mortality. However, observations on each individual commence only when he starts working with asbestos.

A comparison with other methods of analysis is made, for instance binary response models and discriminant analysis, and the disadvantages of these methods are pointed out. A brief review of existing computer program packages containing methods for analyzing survival data brings the first chapter to an end.

Chapter 2, "Distributions of Failure Time," contains a review of the most commonly used failure time distributions. The concept of hazard is introduced, and its usefulness is justified. A chapter like this can be found in almost all of the recent books on the subject, but the authors go a step further and try to give some guidelines in the difficult task of choosing between specific parametric models. The question of under- or overdispersion relative

to the exponential distribution is given special attention. The important problem of non-measurable heterogeneity is touched upon.

Chapter 3, "Parametric Statistical Analysis: Single Sample," deals with estimation and testing based on the likelihood function. Some exact results are known to exist for the exponential distribution, but asymptotic theory is the most commonly used method. Three methods of testing are introduced: likelihood ratio tests, direct use of the MLE and its asymptotic normal distribution, and score tests, i.e., the use of the gradient vector of the log-likelihood function. The authors recommend the likelihood ratio test, mainly because it is invariant under reparametrization. However, they do not discuss the problem of "optimal parametrization" as a device for making normal approximations more accurate and iterative solutions more reliable. Specific methods concerning the exponential and the Weibull distributions are treated to some extent, and an improvement of chi-squared statistics, via a so-called Bartlett correction factor, is mentioned.

Chapter 4, "Single-Sample Nonparametric Methods," treats standard topics, such as the product-limit, or the Kaplan-Meier estimator of the survival function and its grouped data analogue, the actuarial estimator. Variance estimates, via Greenwood's formula, are given and graphical tests for goodness of fit are discussed, for instance, the Nelson plot, which is the natural way of estimating the cumulative hazard function. The Bayesian approach, with the Dirichlet distribution, as a prior, is mentioned.

Chapter 5, "Dependence on Explanatory Variables: Model Formulation," is an introduction to regression models in various forms. Some examples with explanatory variables, constant or time-dependent, are given before the two most commonly used models, the accelerated life and the proportional hazards, are introduced and discussed in detail. Some special topics are briefly mentioned, e.g. several types of failure, non-multiplicative hazard-based model, transferred origin model, accelerated onset model, and models including treatments with a transient effect, i.e. applying only for small values of time. Although it is refreshing to see other models than the commonly used proportional hazards model, the treatment here is more or less to be seen as hints for further reading or research.

Chapter 6, "Fully Parametric Analysis of Dependency," treats fully parametric regression models, i.e., it is assumed that the baseline hazard has a known form but may contain unknown parameters. Exact results are derived for the special case of an exponential distribution and no censoring, while other cases are solved with asymptotic methods. Efficiency of the least squares method in the case of an accelerated life model is discussed. The most interesting part of the chapter deals with the important problem of sensitivity analysis, model fitting and construction of residuals; how to construct reasonable parametric models, and how to examine the adequacy of a given model.

In Chapter 7, "Proportional Hazards Model," the modeling of the baseline hazard is relaxed, and it is assumed that background variables do not vary with time. The semi-parametric approach, due to Cox (1972), is introduced, and various extensions are considered. A careful reading of this chapter gives a good understanding of the philosophy underlying the ingenious, yet simple idea of Cox.

In Chapter 8, more complex models are introduced via the use of time-dependent covariates. The partial likelihood estimation is discussed and its efficiency is compared with a fully parametric analysis. Two-sample tests are derived. Then the authors give a method, consisting of sampling in the risk set, which reduces the computational burden for fitting the log-linear proportional hazards model. As an example of how the analysis with time-dependent covariates works, the Stanford heart transplant data are studied in detail. This data set is, incidentally, used as an illustration in many textbooks on survival analysis.

In Chapter 9, "Several Types of Failure," the classical problem of competing risks, going back to Daniel Bernoulli's (1760) study of the potential consequences of eliminating smallpox as a death cause, is given a precise treatment, and certain extensions, such as to "marked failures," are introduced. A test for proportional hazards versus a time trend is also given in the case of two failure types. The generalization of the test to more than two failure types is given as an exercise.

Chapter 10 is devoted to bivariate survivor functions. Whereas the competing risk problem can be described as if there were two or more failure times and we can only observe

the smallest of the two, it is now assumed that each unit has two survival times which both can be observed (apart from possible censoring). Further, both the survival times are regarded as responses, so the problem is that of correlation rather than of regression. Two bivariate survival function models are considered, and tests of independence and of equality of marginal distributions are given.

The self-consistency and EM concepts, attributed to Efron (1967) and Dempster et al. (1977), are applied to survival data in Chapter 11. The merits of the EM algorithm relative to its main competitor, direct maximization of the log-likelihood function by the Newton-Raphson procedure, are summarized as follows: "The latter method requires calculation and inversion of the matrix of second derivatives, a time consuming procedure if the parameter vector has large dimension. Divergence is much more frequent, as a full Newton-Raphson step will not necessarily increase the log-likelihood. As against this, the Newton-Raphson method usually converges rapidly when it does converge, in particular when the log-likelihood is well approximated by a quadratic function, and the inverse of the matrix of second derivatives is often needed for the estimation of standard errors." This citation is quite representative of the style of the entire book. The authors explain difficult problems in a clear and readable manner. However, occasionally the reader is left without much support, and some effort is then necessary to fully appreciate the authors' intentions.

Each chapter ends with a collection of exercises. They are well chosen and give the reader deeper insight into the theory. However, no solutions are given, which one regrets in some instances.

To summarize, the book is an excellent introduction to survival analysis and more, an inspiring source for further research. It is more devoted to explaining ideas and less to specific techniques, compared to other books in the field. Many questions are left more or less open or as exercises, which is a challenge for the ambitious reader. A reader interested in merely an introduction to survival analysis can just pass by the more demanding parts without fear of losing sight into the main line of the book.

References

Bernoulli, D. (1760): Essay d'une nouvelle analyse de la mortalité causée par la petite Vérole, et des avantages de l'Inoculation pour la prévenir. Mém. de l'Acad. R. Sci., pp. 1–45.

Cox, D. R. (1972): Regression Models and Life-Tables (with discussion). Journal of the Royal Statistical Society, Series B, Vol. 34, pp. 187–220.

Dempster, A. P., Laird, N. M., and Rubin, D. B. (1977): Maximum Likelihood from Incomplete Data via the EM Algorithm (with discussion). Journal of the Royal Statistical Society, Series B, Vol. 39, pp. 1–38.

Efron, B. (1967): The Two Sample Problem with Censored Data. Proceedings of the 5th Berkeley Symposium, Vol. 4, pp. 831–853.

Kalbfleisch, J. D. and Prentice, R. L. (1980): The Statistical Analysis of Failure Time Data. Wiley, New York.

Lawless, J. F. (1982): Statistical Models and Methods for Lifetime Data. Wiley, New York.

Miller, R. G. (1981): Survival Analysis. Wiley, New York.

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Chambers, J. M., Cleveland, W. S., Kleiner, B., and Tukey, P. A., Graphical Methods for Data Analysis. Wadsworth International Group, Belmont, CA and Duxbury Press, Boston, 1983, ISBN 0-534-98052-X, xiv + 395 pp, $24.95.

This is a book about modern graphical data analysis. Some methods are new, some are old, some require a computer, and others only paper and pencil. There is little discussion on communication graphics, such as pie charts. Instead the methodology in this book is aimed towards analyzing a set of data and learning more about its structure.

The book presents a number of recent graphical methods useful to explore data thoroughly, to look for patterns and relationships, to confirm or disprove the expected, and to discover new phenomena. As is said in

the introductory chapter: "There is no single statistical tool that is as powerful as a well-chosen graph."

All the authors are statisticians at Bell Laboratories. Their own experience in data analysis has shaped the viewpoints in the book. According to the authors, the methods presented in the book have proved useful in their work at Bell Laboratories.

The book is written for anyone who either analyzes data or expects to do so in the future, including students, statisticians, scientists, engineers, managers, doctors, and teachers, according to the authors.

The book is suitable for individual studies as well as for classroom use. The detailed examples, the large number of exercises, and the appendix containing 33 data sets, taken from a variety of fields, and used in the examples and exercises, all make it easy to experiment with the graphical methods described in the book. The way the book is written encourages active reading.

The first half of the book assumes only a knowledge of elementary statistics. The second half requires some knowledge of probability distributions and assumes that the reader is familiar with the basics of regression methodology.

The text is organized into eight chapters entitled:

1. Introduction,
2. Portraying the Distribution of a Set of Data,
3. Comparing Data Distributions,
4. Studying Two-Dimensional Data,
5. Plotting Multivariate Data,
6. Assessing Distributional Assumptions About Data,
7. Developing and Assessing Regression Models,
8. General Principles and Techniques.

In addition, there is a nice bibliography with over 100 recent references to work in the area of graphical data analysis and the earlier mentioned appendix with 33 data sets. Each chapter is rounded off in an excellent way with a section entitled "Summary and Discussion" followed by a section called "Further Reading."

Chapters 2, 3, and 4 successively build a solid foundation for the rest of the book. In Chapter 5, "Plotting Multivariate Data," three basic approaches for looking at data in three dimensions are first studied, all of which involve twodimensional scatter-plots in special ways. These basic methods are then extended for plotting data in four or more dimensions, leading to, e.g., generalized draftsman's display, symbolic star plot, symbolic profile plot, tree symbol plot, and multiwindow display.

Chapter 6, "Assessing Distributional Assumptions About Data," dealing mainly with quantile-quantile plots, is treated in a clear way. Here questions like "How straight is straight?," when judging quantile-quantile plots, are dealt with as well as censored and grouped data.

In Chapter 7, "Developing and Assessing Regression Models," a working knowledge of the basic concepts and techniques of regression analysis is assumed. No attempt to teach regression is made. Instead, the emphasis is on what variables are plotted and what information regarding the regression model is conveyed by the plots. The chapter is organized into three parts dealing with graphs for exploring the raw data before any serious regression analysis is done, graphs for use during the analysis, and graphs to be employed after the model has been fit. This chapter ought to be read by everyone using regression analysis.

On the whole, the book is clearly written. The methods are applied on examples from a variety of fields, making the treatment lively and easy to read. This is a book that should be available for everyone dealing with the analysis of data. I also believe it to be a suitable textbook for a course in graphical data analysis. I have not tried it as a course book yet, but after reading the book I am planning to do so in a course designed for specialists in fields other than statistics.

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Hollander, M. and Proschan, F., The Statistical Exorcist: Dispelling Statistics Anxiety. Popular Statistics Series, Vol. 3, Marcel Dekker, Inc., New York, 1984, ISBN 0-8247-7225-3, 264 pp., $21.50.

The authors start from the premise that a great many students who should understand statistics but don't are prevented from doing so by

the fact that practically every statistics text in existence uses the language of algebra. The intention of the present text is "to narrate in plain English words how statistics is used (and sometimes misused) in everyday life." To do so, the authors have written 26 vignettes "to illustrate real life applications of statistics without the use of algebraic symbols." Each vignette has a summary, a number of problems, and a list of references. Some of the vignettes are accompanied by cartoons, presumably to lighten the reader's progress.

The 26 vignettes are arranged rather loosely under four headings: (i) making decisions, (ii) sampling, (iii) learning from data, (iv) estimating probabilities. Examples of titles are:
(i) monitoring a nuclear reactor, predicting the reliability of a complex system;
(ii) capture-recapture, negotiating a contract in the absence of competitive bids;
(iii) do people agree? do overweight men tend to have high blood pressure?
(iv) reliability growth, the birthday problem.

The reviewer agrees that a great many present-day statistics texts overemphasize the mathematical side of statistics and that this emphasis on mathematics has discouraged a great many students and prevented them from appreciating the importance of statistics in everyday life. Yet, the reviewer doubts that the present text will have any more success in trying to convince today's students that the ability to think quantitatively is nearly as important as the ability to read and write. At best, the present text is going to convey some vague impressions of what statistics and probability try to do without providing any real understanding.

Reflecting the interests of one of the authors, there is an inordinate emphasis on industrial applications, particularly of the reliability type. While the authors studiously avoid using mathematical notation, a need to think mathematically is always in the background. Nonmathematically minded readers are still going to have a hard time and mathematically minded readers are going to feel frustrated by the lack of formal statements. The book may be most useful as supplementary reading. However, as the principal text for a course, it lacks cohesiveness and substance.

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Schuman, H. and Presser, S., Questions and Answers in Attitude Surveys: Experiments on Question Form, Wording and Context. Academic Press, New York, 1981, ISBN 0-12-631350-4, 392 pp., $29.50.

This book is a volume in the series *Quantitative Studies in Social Relations* (Ed. Peter H. Rossi); a series of books that holds interest for the survey methodologist and practitioner. Both authors work at the Survey Research Center at the University of Michigan and are wellknown experienced researchers in the field of survey methodology.

The book focuses on the effects of different question characteristics on the responses in attitude surveys. The approach is heavily quantitative and the data come from over 200 experiments in more than 30 different surveys. The design has mainly been the split-ballot experiment, but panel data have also been used. This book does not only deal with the construction of survey questions; it focuses on how the different aspects of question construction affect the results obtained in surveys. Naturally, many of the reported findings are also relevant to the construction of survey questions and such guidelines are also given.

The book includes chapters on question order and response order, open vs closed questions, the assessment of no opinion/middle position, balance and imbalance in questions, acquiescence, attitude strength, tone of wording, and implications for research on surveys. Appendices are included that give detailed information on research procedures etc.

It should be noted that the authors are interested in the effects of question-form parameters not only for marginal frequencies, but also for relationships between variables. Many of their findings with regard to the latter area are quite novel and highly interesting. It is particularly praiseworthy that they take the replication problem seriously and include several replication studies in their research program. This greatly enhances the importance of their findings.

Building on their empirical results, the authors provide lucid discussions of, among other things, the following subjects:
(1) the definition and measurement of attitude strength and its relation to random and sys-

tematic effects in measurement;
(2) the study of the acquiescence phenomena;
(3) the definition and measurement of 'floaters' (i.e., people who say "don't know" when this response category is offered, but otherwise express an attitude).

Their approach to these topics is grounded in common sense and confined, theoretically, to the survey methodology field; they have not made use of elaborated theoretical frameworks available in sociology, psychology and linguistics. They frankly state that they have not found such frameworks to be of much use in their context (p. 313). There may be good reasons for their position on this matter and the results of their view certainly are highly interesting and lucid, and commendably close to the empirical evidence. Due perhaps to my perspective as a psychometrician I believe that a systematic use of theories and concepts from differential psychology could further add to the understanding of why response effects occur. Such effects exhibit interindividual differences that merit further investigation. The promise of this approach is demonstrated by the authors in their study of floaters.

From a Swedish point of view, it is a pity that the book does not include a study of mail questionnaires. Due to various reasons this form of data collection is more viable in Sweden than in the U.S., and methodological studies have been performed at Statistics Sweden where mail questionnaires have been compared to other data collection methods in various respects (mainly by the unit concerned with measurement techniques lead by Bo Wärneryd; see Bergman and Wärneryd (1982)).

In summing up, *Questions and Answers in Attitude Surveys* is a very useful book on the effects of question form on the answers in attitude surveys. It does not cover in great detail content effects, which are covered in e.g., Sudman and Bradburn (1974) or the interviewee's perception and cognition in the data collection process which are covered by Belson (1981). However, within its realm, Schuman and Presser's book is, to the best of my knowledge, the only book presenting most of the empirical evidence available, and this is done lucidly and with great expertise. The book is virtually a treasure chest for the survey methodologist and the survey practitioner.

References

Belson, W. A. (1981): The Design and Understanding of Survey Questions. Gower, Aldershot.

Bergman, L. R. and Wärneryd, B. (1982): Om datainsamling i surveyundersökningar (On Data Collection in Survey Research). Liber, Stockholm. (In Swedish.)

Sudman, S. and Bradburn, N. (1974): Response Effects in Surveys. Aldine, Chicago.

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Sterben die Schweizer aus? Die Bevölkerung der Schweiz: Probleme, Perspektiven, Politik. Herausgegeben von der Kommission Bevölkerungspolitik. – Also available in a French edition. Paul Haupt, Berne and Stuttgart, 1985, ISBN 3-258-03470-2, SFR 38.–.

During the postwar period, much has been said about the serious consequences of rapid population growth in the Third World. In most countries with a European population, the problem is the opposite; fertility is so low that the population does not reproduce itself. Since it is not possible to transfer any sizable number of people from one culture to another, it is important to consider the long term consequences of a fertility rate considerably below what is required for replacement.

The present volume deals with the question "Are the Swiss dying out?" The book has been planned and written by a nine member commission on population policy elected by the Swiss Society for Statistics and Economics. Its authorship gives it a quasi-official character.

After a brief introduction, Chapter 2 is devoted to a detailed presentation of the Swiss population. Many types of statistical data are utilized, including those of a historical character. In the following chapter, the population projections published by the Swiss Central Bureau of Statistics are presented. Chapter 4 is devoted to an analysis of the economic and social consequences of the current and the expected future population

changes. The fifth and last chapter discusses population policy measures.

Each section is signed by its author. However, the book does not consist of a collection of separate papers. A considerable amount of work must have been devoted to making it a homogeneous entity.

A study of the data presented in the book confirms the impression that Switzerland is a country that has been subject to less pronounced social change than other parts of Europe. Thus, although the divorce rate has gone up, the increase is much smaller than in other countries. Furthermore, illegitimate children are quite few, and non-married cohabitation is more or less unknown, at least among couples with children. We can also note that in 1960, not more than about 40 per cent of the female population between the ages 30 and 40 were in the labor force. In 1980, the figure had risen to 50 per cent (native Swiss population only). Every second woman in the childbearing years is still a full-time housewife.

Economic activity among married women is usually considered an important factor in explaining the post-war decline in fertility in Europe. Given that relatively few Swiss women are active in the labor market, one might not expect Switzerland to have such a low fertility rate. However, total fertility in Switzerland from 1977 through 1982 varied between 1.50 and 1.55; it was nearly as low as in West Germany and far below the level required for reproduction (2.15). The net replacement rate (NRR) in 1982 was 0.73.

The projections presented imply three alternatives with regard to fertility. The low variant is based on the assumption that fertility will remain at the present level. The medium variant assumes that fertility will grow so that the NRR will reach 0.88 at the end of the century. The third variant assumes that the NRR will reach 1.03 by the end of the century.

Alternative 1 gives a rapid population decline. The present population of 6.4 million will decline to about 4.9 million by 2040. Alternative 2 also predicts a decline, although a slower decline.

In the long run, alternative 3 will give a constant population but according to this alternative, there will be a period of a certain decline from 2025 to 2060.

Alternative 1 predicts a considerable aging of the population. In this connection, a mistake on page 210 may be mentioned. The authors maintain that the aging process continues forever in a stable regressive population. This is not the case. When the stable state has been attained, its relative age composition remains constant.

The discussion about the reasons for the decline in fertility does not end with any firm opinion. However, the fact that the authors have accepted the three alternative projections mentioned above imply that they believe that fertility will increase. The medium alternative implies that fertility in the year 2000 will be about 20 per cent higher than it is today. It would seem that a continued decline in fertility to a level even lower than the present one is a possibility that merits more discussion. There are parts of Italy and West Germany that today have a fertility rate that is considerably lower than the current Swiss rate.

The discussion in Chapter 4 about the economic and social problems arising as a consequence of population changes would have benefited from further discussion explaining that opinion in this field is divided. The final chapter, which discusses possible population policy measures, seems to be a bit too compromised, probably the result of conflicting positions among the authors.

The authors conclude that the country's population target should be a population that is stationary in the long run. Solutions that entail any substantial immigration from other countries have been rejected in several Swiss referendums, and mortality is already so low in the age groups responsible for reproduction that further improvements are not possible. To achieve a stationary population, fertility must be increased considerably. The authors point out that in Switzerland, not less than 34 per cent of all women remain unmarried and childless at the age of 50. If this percentage remains unchanged, 60 per cent of the married women must have on the average four children if a total fertility rate of 2.15 shall be attained. If the proportion unmarried women is reduced to half, or 17 per cent, 62 per cent of the families must have three children. This means that the three child family would be the norm. Today, the norm is the two child family. The data make it clear that substantial changes

must occur if replacement and a stationary population shall be attained in Switzerland.

Various policy measures are discussed by the authors; the main stress is placed on child allowances, taxation reforms, housing measures, and the introduction of sickness insurance. In a society like Switzerland, where the childless and pensioners have traditionally played a dominating role in politics and economics, it will not be popular to start a policy that entails the transfer of considerable resources from the childless to families with children. The mere fact that the population will soon start to decrease will hardly be sufficient to encourage the majority of the population that a policy favouring families with children is necessary. It is to be expected that it will take a long time before it is generally accepted that a population policy is essential.

The book is ambitious and except for the above comments, covers the field well. What is obviously lacking are female points of view. After all, childbirth and child raising cannot be left to men only. Of the nine authors, eight are men; that number nine is a woman does not seem to alter the character of the book in any substantial way.

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