Measuring more or less: Estimating product period penetrations from incomplete panel data
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Acknowledgements

In my experience commercial research projects are rich sources of ideas for scientific research. But at the same time these projects leave little time to do so. This was exactly the case during my job as a statistician at Stichting Telepanel (STP) in Amsterdam. One of STP's projects was to report household consumption of meat products to the Productschap van Vee en Vlees (PVV). The project, run by Edwin van den Oort and Corine Tiebosch, demanded weekly collection of purchase data. Each week the respondents of the telepanel were to fill out a questionnaire on consumption of meat products using computers provided by STP. The project was not a very popular one, as one could conclude from the respondents reactions, sometimes being 'Ik heb schoon genoeg van die vragenlijsten over vlees. Kom de hele handel maar ophalen!'. At that time Willem Saris, scientific director of STP, asked me to look for arguments to reduce the number of measurements. Dirk Sikkel provided a statistical framework to study the problem. The idea was that the loss of precision of the estimators from the reduction of measurements would be – at least partially – compensated by the benefits from a lower drop out. This request resulted in an internal paper titled 'Meer weten met minder meten' that resulted into chapter 2 of this thesis.

A reduction of the number of measurement makes panel data incomplete, and thereby creates the need of a method for product period penetration estimation using incomplete panel data. At that time I was AIO (Assistent In Opleiding), allowing me to spend time for academic research on this topic. Here Dirk Sikkel's expertise on renewal processes was very helpful, and a first approach to tackle the problem resulted into chapter 3 of this thesis. Although the research was originally motivated from a wish to reduce the number of measurements, it was actually used to overcome some other problem. Although we intended to measure the consumption of meat products every week, in fact we did not, since respondent sometimes go for a holiday, or sometimes they are ill or simply do not feel like filling out a questionnaire. Thus the method was actually implemented in the process to create the consumption reports for PVV to overcome wave nonresponse. Everything went well. When the reports of the second quarter of 1994 were published, it came as a big surprise to all of us that the method turned out to inconsistent penetration estimations. PVV discovered that our report stated that in the first half year of 1994 a higher percentage of consumers bought a knakborrelworst than in the first quarter of 1994! Here the advantages of being an AIO and not being responsible for the reports became clear. One could also observe a difference in solving the problem between me and Edwin. Edwin solved the problem in five minutes by adapting the estimation procedure by use a function that selects the maximum of two values. I spend three more years studying bivariate Poisson processes (chapter 4) and variance component models (chapter 5, 6 and 7).

Doing scientific research is an emotional process. During these years my state of mind varied from extreme joy to (sometimes) deep bitterness. I have good memories of the lively discussions with Dirk, creating new ideas of which only one percent could be tried. The
best moments were those that lasted about three seconds after I had discovered something new – or at least I thought I had – and the mathematical elegance of it touched my heart. Are nine seconds enough to compensate all the bad times? The worst moments were those when an estimation procedure ran on a computer and refused to converge – although I was sure that I fixed the last error – and when the interruption of the computer meant that the complete program was gone. Especially in those moments it was good to have colleagues that institutionalised the *staandaardprocedure* in the nearest possible pub. Thanks to their support I can answer ‘Yes!’.

I’d like to thank Dirk Sikkel for being an inspiring promotor. I hope that he is not too disappointed that the cover of this thesis does not show a picture of a steak. I’d like to thank Willem Saris for initialising the project and for his support during the preparation of chapter 2. I’d like to thank Anna Espinal from Manresa - Barcelona (don’t ever say she is from Spain!) and Hans Jansen for their support during the preparation of chapter 3. I’d like to thank Mariline Feron for checking parts of the text. I’d like to thank my colleagues Peter Fontein, Benedict Dellaert, Rob Alessie, Klaas de Vos, Marcel Das, Jan Nelissen and Hans Bloemen for their offer to have this thesis as the first official CentER Applied Research publication after we decided to change the name EIT. I’d like to thank Maarten Schuerhoff, Dirk Sikkel and Paul Janssen for finding assignments or for helping me in some other way to run the *eemanszaak ‘Estics’* and add money to the AIO salary. I’d like to thank my friends for their friendship, especially Gerda Schorreels, Bart Spaargaren (I’d like to dedicate page 49 to him), Schoppenboer (my *maatje* Nelly Kalfs, but also our opponents Annelies Daalder and Coen van Rij), 232 (I expect that Jan Kleijn will be the next PhD in this group), Siski (I wonder what question Leon Vermeulen will ask me in the future) and Casa Prats (I apologise that I ever suggested that ‘Prats’ is spelled with a ‘z’). *Graag wil ik mijn beide ouders en mijn zus Els bedanken voor de steun en warmte die zij mij altijd gegeven hebben.* Finally I’d like to thank my girl friend Wendy for being supportive in many ways and for helping me find a title for this thesis. I have to admit that the one that was eventually chosen was more or less her idea.