Sole Source Justification

MINORITIES, WOMEN, VETERANS AND
THE 1982 CHARACTERISTICS OF BUSINESS OWNERS:
A PRELIMINARY ANALYSIS

Submitted by:
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Submitted to:
U.S. Small Business Administration
1441 L Street, N.W.
Washington DC 20416

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The justification for awarding Faith Ando and Associates, Inc., a sole source contract lies in four areas: the owner and her team's demonstrated track record since 1982 in the quality of the statistical analysis of issues in entrepreneurship by demographic groups; its understanding of the 1982 Characteristics of Business Owners (CBO) and the type of preliminary tabulations both SBA and MBDA would like from the 1982 CBO; the firm's ability to deliver camera-ready copies of all tabulations (as well as a text) that SBA needs for policy purposes by January 12, 1988; and the cost at which it proposes to do so. Of these factors, we believe the most important are the training and experience of the owner and her team in the subject area (issues in entrepreneurship by demographic groups) and in statistical methodologies/estimation procedures. It is important to have a team of high quality in the preliminary analysis of the 1982 Characteristics of Business Owners, especially when the tabulations might be used for policy purposes.

The remainder of this introduction discusses the quality of the team that Faith Ando & Associates, Inc., would assemble for this project. The type of safeguards (in terms of more than one person for a functional position) to ensure the timely completion of the project are also mentioned. This statement concludes with an identification of the women and minorities who would participate in this research. The appendix to this statement
The Principal Investigator and Project Manager would be Dr. Faith Ando who has a Ph.D. in Economics from Harvard where her fields of specialization were statistics/econometrics and public finance/fiscal policy. Dr. Ando has a demonstrated track record in performing a timely statistical analysis of data bases in the subject area of entrepreneurship by demographic groups. The research has been performed for three Government agencies: the U.S. Small Business Administration (SBA), U.S. Minority Business Development Agency (MBDA), and U.S. Economic Development Administration (EDA). EDA and MBDA are part of the Department of Commerce. The results of her work have been refereed and selected for presentation at scholarly meetings and in scholarly publications. For example, she has presented three papers at the prestigious meetings of the American Economic Association. One paper was on minority entrepreneurship; one concentrated on entrepreneurship by women compared with men business owners; and the third was on an unrelated topic: the role of idled resources in the cost-benefit calculus. Finally, Dr. Ando herself has hands-on experience with SAS programming via some of her work with the U.S. Environmental Protection Agency.
Dr. Ando would be assisted in the proposed work by two Senior Statisticians, Dr. Albert Ando and Dr. Roberto Mariano. Both are nationally recognized in their fields, and both have worked with Dr. Faith Ando on issues in entrepreneurship since 1982.

Dr. Mariano, who would be the chief Senior Statistician/Causal Modeler, has a Ph.D. in Statistics from Stanford University; is a Professor of Economics at the University of Pennsylvania; and has published more than 40 articles in prestigious refereed journals on the theory and practice of statistics and econometrics. Econometrics is causal modelling applied to the subject area of economics.

Dr. Albert Ando, who would serve as a back-up Senior Statistician/Causal Modeler, has a Ph.D. in Mathematical Economics from Carnegie-Mellon; is both a Professor of Economics and a Professor of Finance at the University of Pennsylvania; and is regarded by most economists as one of the world's premier causal modelers. He has served as a consultant on causal modelling to the Governments of Japan and Italy, as well as to the Federal Reserve Board.

Three SAS programmers -- each with clearly defined roles -- would ensure that timely and correct SAS programs were submitted to Census for calculation. They are George Theall, Loren Miller,
and Glenn Sepin. Mr. Theall performed much the same computations as those proposed in this research for Dr. Faith Ando in connection with her recent analysis of a rich and complex data base (using SAS) of 1,300 business owners/250 variables for SBA, EDA, and MBDA. He would serve as a resource person for Mr. Miller. Mr. Miller would prepare the data base for analysis and perform all non-causal modelling. Mr. Sepin, who has worked for Dr. Mariano for a number of years, would perform the SAS programming for the causal models. Mr. Miller and Mr. Sepin would back up each other in the sense that, should one encounter problems, the other would assist him.

Completing the team for this research would be Ms. Even-Shoshan and two research assistants. Ms. Even-Shoshan is an economist with 12 years of experience as a working manager at the Ministry of Finance in Israel. Highly regarded by Joseph Pechman, she would be available to us as a back-up Project Manager and for some SAS programming. Finally, one or two research assistants would be used to transcribe numbers from computer print-out sheets to tables suitable for typing. The firm would recruit them from senior undergraduates at local colleges, where the pool would be those who had either statistics or mathematics plus some economics.

Faith Ando & Associates, Inc., is a small business that is more than 51 percent owned, managed, and controlled by a woman.
Three out of four of the subcontracts would go to disadvantaged minorities.
APPENDIX A

BIOGRAPHICAL INFORMATION/RESUMES

Resumes are included for:

1. Faith Ando, Ph.D., the proposed Principal Investigator/Project Manager,

2. Roberto Mariano, Ph.D., the co-Senior Statistician/Causal Modeler,

3. Albert Ando, Ph.D., the co-Senior Statistician/Causal Modeler,

4. George Theall, Resource Person on SAS Programming,

5. Loren Miller, SAS Programmer for Non-Causal Modelling, and


RESTRICTIONS ON DISCLOSURE AND USE OF DATA;

Unless disclosure is required by the Freedom of Information Act, 5 U.S.C. 552 as amended, (the Act) as determined by Freedom of Information Officials of the U.S. Small Business Administration, no part of the biographical information/resumes shall be used or disclosed except for evaluation purposes.
Dr. Ando would serve as Principal Investigator and Project Manager for Faith Ando & Associates, Inc., a new corporation that she also owns. Some of her qualifications for this position are in the discussion below.

Immediately prior to starting this firm in July 1987, Dr. Ando was Senior Economist and Statistician at JACA Corporation, a small management consulting and engineering firm located in Ft. Washington, Pennsylvania. As JACA's Senior Economist, she was Principal Investigator for eleven projects that are described below; Project Director for five of them (actually bringing in the work herself); and provided technical input into most of JACA's other projects in the subject area of economics. As JACA's in-house statistician, Dr. Ando addressed issues such as sample size, sample stratification, and sample selection bias for projects by the firm's engineers as well as its economists.

In projects at JACA in which she served as Project Manager
as well as Principal Investigator, she did everything except channel the work through her own firm. More specifically, she:

- Developed the idea for a proposal and wrote it,
- Assembled a staff/colleagues from outside JACA to conduct the work, including but not limited to a distinguished Professor of Economics to serve as Senior Statistician,
- Arranged for access to an excellent but inexpensive mainframe computer, where necessary,
- Conducted the specified work in conjunction with her staff/colleagues,
- Interfaced with the client,
- Wrote the Report and its Executive Summary with the analysis results, and
- Managed the budget. (The formal accounting was performed by JACA's Contract Administrator).

In the discussion below, some of Dr. Ando's experience working for firms or organizations that she did not own is discussed. Major attention is given to her work at JACA, because she spent the longest period of time there, namely, seven years. Within the JACA experience, the discussion is further divided into Dr. Ando's five projects in applied research, on the one hand, and her six program evaluations, on the other, in order to highlight two somewhat different categories of economic skills.

As the discussion below makes clear, more than 90 percent of

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Dr. Ando's projects have involved the statistical analysis of information, where the information or data has either come from existing sources or been developed by Dr. Ando for the purposes of the research or program evaluation. In cases where primary rather than existing data bases were developed, she used one or more of each of three surveying techniques: mail-in/mail-out, telephone interviews, and personal interviews. The data bases she analyzed included cross-section data, time series data, and longitudinal files; one of the longitudinal files tracked 33,000 individuals and their firms over five time periods. In her analysis, she used a variety of standard statistical and econometric techniques, as well as some that are not as standard, as discussed below. Some of her analysis involved causal modeling, whereas other parts of the analysis did not.

In a final subsection, Dr. Ando's work at three other firms/organizations is discussed. They are Wharton Econometric Forecasting Associates (WEFA), Tufts University, and the U.S. Council of Economic Advisers.

**Applied Research at JACA:**

Dr. Ando's applied research at JACA was in issues in entrepreneurship. It was applied research in the sense that the work was only loosely tied to the program objectives of the three agencies of the Federal government that supported the studies.
The three agencies were the U.S. Economic Development Administration (EDA), U.S. Minority Business Development Agency (MBDA), and the U.S. Small Business Administration (SBA). EDA and MBDA are part of the U.S. Department of Commerce.

Dr. Ando's most recent work on entrepreneurship was a series of three interrelated studies, one each for EDA, MBDA, and SBA. Each of the three studies analyzed an aspect of a unique national data base. The data base, which had more than 250 variables, had been constructed from the response to a questionnaire. Twelve hundred of the response to the questionnaire were obtained by mail, and 100 were obtained in telephone interviews. The group sampled was small business owners who differed in their demographic characteristics. In the case of the SBA study, the interest was primarily in women-owned firms compared with men-owned firms. In the case of the MBDA study, the interest was in minority business owners (Asians, blacks, and Hispanics) compared with nonminority business owners. In the EDA study, published data on exogenous demand conditions were added to the responses to the questionnaire.

In these three studies, Dr. Ando used a variety of standard statistical techniques, as well as some that are not as standard, in order to investigate a variety of capital issues and the performance of a firm. Specifically, these statistical techniques were calculated or employed: (1) means, standard deviations,
and t-tests for several women/men and minority/nonminority pairings, (2) a correlation matrix, (3) about 50 equations estimated by using ordinary least squares (OLS) regression techniques, (4) two-stage least squares rather than OLS where needed to reflect simultaneity in the equations, and (5) non-linear probability models rather than linear probability models where appropriate. As the list makes clear, some of the statistical techniques involved causal modeling, whereas others did not.

The three reports that resulted from an analysis of the responses to the questionnaire have provided a rare glimpse at business owners and their firms' capital and performance, where the owners differ in ethnicity and gender. As a result, Dr. Ando has already given or is giving three papers based on her results to meetings of academic economists; UCLA is publishing one set of the results. Although we think this is a magnification of the importance of the studies, Parren Mitchell, Chairman of the House Committee on Small Business in the last Congress, has cited Dr. Ando's results as having "far-reaching implications for setting public policy" insofar as the results shed light on whether or not there is discrimination in commercial banks' business lending.

In addition to these three interrelated studies, Dr. Ando conducted two other empirical studies on minority entrepreneurs...
for MBDA, both using existing data bases. In one of these, she analyzed the determinants of the growth and failure of minority-owned firms "versus" nonminority-owned firms. All of the minority-owned firms in the data base had received management assistance advice from MBDA. For this project she and her colleagues reviewed the literature; developed conceptual hypotheses about the determinants of both growth and failure; evaluated a proprietary (to MBDA) longitudinal data file that tracked 30,000 minority-owned firms and 3,000 nonminority-owned firms over five time periods; collected and prepared data from the Bureau of Labor Statistics (BLS) on employment growth by four-digit SIC industry and SMSA locale; prepared a profile of growing and failed firms; produced statistical results; and wrote the final report, including its Executive Summary. Multivariate regression techniques were used for the statistical analysis of growth, and probit analysis was the statistical technique used for the analysis of failure. Dr. Ando and Robin Sickles, an associate professor of economics at Rice University, presented a paper based on their research to a joint session of the American Economic Association and the National Economic Association in San Francisco in December 1983.

Finally, in another earlier study for MBDA, Dr. Ando analyzed the determinants of the formation and failure rates of minority-owned firms by two-digit SIC industry and geographic region. The data base for the study was the 1972 and 1977
economic census (complete count) of minority-owned firms in the U.S. The primary contribution of the study to the literature on minorities was its test of the hypothesis that much of the variation in formation and failure rates can be explained by the classic (independent of minority status) barriers to entry suggested by industrial organization theory. A paper based on her research was published in the fall 1986 Review of Black Political Economy.

Program Evaluations at JACA:

Turning to Dr. Ando's projects in the area of program evaluation, we find that this work included both prospective (ex ante) and retrospective (ex post) evaluations of a government agencies programs or rules. The program evaluations were performed for three Offices/branches of the U.S. Environmental Protection Agency (EPA). The three Offices/branches were the Economic Analysis Branch (EAB) of the Office of Air Quality Planning and Standards (four evaluations); the Office of Water Planning and Standards (one evaluation); and the Office of Toxic Substances (one evaluation).

Three of the four projects for EAB involved an ex ante evaluation of the likely effects of the estimated engineering costs associated with air pollution control on an industry(s) and on the U.S. economy. Industry effects that were estimated
quantitatively were the effects on its prices, profits, employment, and capital availability. Economy-wide effects included the impact of engineering costs on general prices levels, overall employment, and the balance of payments, as well as their distributional effects on small businesses.

These three projects for EAB each involved different industries and different pollutants. One dealt with the wool fiberglass insulation industry. A second concerned seven segments of the glass manufacturing industry. And the third (incomplete at the time Dr. Ando left JACA) dealt with the 39 three-digit SIC industries that use degreasers as part of their metal-cleaning operations.

An unusual feature of the wool fiberglass insulation study at the time it was performed was that Dr. Ando developed a small econometric model of the industry's prices and output from 1962 to 1980. She then used it along with forecasts of exogenous variables (such as the size of the retrofit market) in order to evaluate the likely effects on the future output of the industry from 1981 to 1991 if capital expenditures were made in compliance with the proposed regulation. She prepared (with Richard Jenkins at EAB) a poster session with the econometric results of the study for the Air Pollution Control Association in Atlanta in June 1983.
Although the degreasing project was incomplete at the time Dr. Ando left JACA, three features of the study may be of interest. One, she estimated price elasticities of demand for 12 two-digit user-industries by using two-stage least squares (hence, estimated both demand and supply equations). Two, she designed and implemented two sets of telephone interviews with industry members likely to be affected by the regulation, namely, degreasing equipment manufacturers and auto repair shops. Three, she and Tom Walton at EAB proposed in their methodology to incorporate explicitly into the analysis the social as well as the engineering costs of the regulation to society. By this is meant that the loss in consumers' surplus due to the regulation would be evaluated.

In addition to these three projects for EAB in the area of an ex ante program evaluation, Dr. Ando also performed an extensive retrospective (ex post) analysis of the economic impact of the ban on the use of chlorofluorocarbons (CFCs) as aerosol propellants for EPA's Office of Toxic Substances. The effects of the ban on both consumers and producers of aerosols were examined and quantified, partially by econometric methods. The effect on consumers' surplus was estimated in dollar terms. Dr. Ando developed case studies of the 13 sectors directly affected by the ban. In her analysis, she gathered primary data via personal and telephone interviews with businessmen, scientists, and engineers in the affected industries. The implications of her findings for
standard cost-benefit analysis were presented to a meeting of the American Economic Association in San Francisco in December 1983. The major conceptual and empirical advances she made in the CFC study were to identify the role of nontransferable resources in augmenting the resource costs to society of the product ban and then to calculate the actual costs due to idled equipment.

In a fifth project, Dr. Ando assessed the economic benefits of Federal funding to restore water quality in six lakes and reservoirs used for recreational purposes for EPA's Office of Water Quality. The benefits -- which were expressed in dollar terms, where possible -- were in one or more of these categories (depending on the lake involved): recreation, aesthetics, flood control, economic development, fish and wildlife, agriculture, property value, public health, and pollutant reduction. The six lakes or reservoirs were along the East Coast from Maine to Virginia. Most of the data came from personal interviews she conducted at each of the six lake sites.

Finally, Dr. Ando prepared two non-quantitative technical papers for EAB on regulatory alternatives to existing command-and-control approaches to regulating air pollution. Among the alternatives reviewed were charges (emission fees, activity taxes, excise taxes); subsidies (direct and indirect); and trading (the bubble policy, offsets, banking, and marketable permits).
Employment and Experience Prior to JACA:

Prior to joining JACA, Dr. Ando was an economist at WEFA where she and Lawrence Klein, winner of the 1980 Nobel Prize in Economics, developed an econometric model of the coal industry and projected its output, employment, prices, and wages some 20 years into the future. The core coal model had 165 equations, one-third of them behavioral. In addition, there were other equations which captured cross-sectional relationships among coal output, quality, and wage rates in each of nine coal-producing regions. There were about 1,000 variables in the data base with each variable having approximately 30 observations. Dr. Ando gathered, collated, processed, analyzed, and reported on each variable in the data base. The model was constructed for the Electric Power Research Institute (EPRI).

Before joining WEFA, Dr. Ando was Assistant Professor of Economics at Tufts University, where she taught labor economics, macroeconomics, and industrial organization. She also worked for Otto Eckstein at Harvard and at the U.S. Council of Economic Advisors. At the CEA, her chief responsibility was to assist Dr. Eckstein in an analysis of the relationship among materials' costs, wages, and prices.

She is a member of the American Economic Association.
Papers and Publications:

Dr. Ando's paper and publications include the following:


- An Analysis of Access to Bank Credit. An occasional paper being published in 1987 by UCLA's Center for Afro-
American Studies.


- "Business Activity and Failure of Minority-Owned Firms." A paper presented to a joint session of the


- "The Wool Fiberglass NSPS: An Econometric Approach." A poster session at the Air Pollution Control Association meetings in Atlanta in June 1983. (With Richard Jenkins)

- Chapter 7 of **Background information Document (BID): Inorganic Arsenic Emissions from Glass Manufacturing Plants.** An economic analysis of proposed air pollution controls for the U.S. Environmental Protection Agency, April 1983.

- Chapter 9 and Appendix E of **Background Information Document (BID): Wool Fiberglass Insulation Manufacturing industry.** An economic analysis of proposed air pollution controls for the U.S. Environmental Protection Agency, February 1983.

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- "Regulatory Alternatives to NSPS" and "Regulatory Alternatives to NESHAPs." Two reports to the U.S. Environmental Protection Agency, October 1982.


ROBERTO MARIANO

Ph.D., Statistics, Stanford University
M.S., Mathematics, University of Illinois
M.S., Statistics, University of the Philippines
A.B., Mathematics, Ateneo de Manila University, Philippines

Honors: Fulbright-Hays and Rockefeller Foundation Fellowships for Doctoral Studies; University Scholarships (University of Illinois and Stanford University); Rockefeller Foundation Study Grants; Research grants from the U.S. Department of Agriculture and the National Science Foundation.

An American who was born in the Philippines, Dr. Mariano is currently Professor of Economics at the University of Pennsylvania, where he teaches the advanced statistics and econometrics courses to Ph.D. candidates. Econometrics is causal modelling applied to issues that are economic in nature. Dr. Mariano is also active in the Filipino-American community, both professionally and in terms of avocation.

Dr. Mariano is an acknowledged expert in the theory and practice of statistics and econometrics. He has published more than 40 articles in the field, many of which are listed below. His articles on econometric methodology have appeared in such prestigious publications as the Journal of the American Statistical Association, the Journal of Econometrics, and Econometrica.
Dr. Mariano served as a consultant on statistical issues to Dr. Faith Ando in her research into issues in entrepreneurship by demographic groups for SBA.

Dr. Mariano's publications include the following:


"Residual-Based Procedures for Prediction and Estimation in a Nonlinear Simultaneous System," (with B.W. Brown),


ALBERT ANDO

Ph.D., Mathematical Economics, Carnegie Institute of Technology
M.S., Economics, Carnegie Institute of Technology
M.A., Economics, St. Louis University
B.S., Economics, Seattle University

Honors: Fellow of the Econometric Society, Ford Foundation
Faculty Research Fellow, John Simon Guggenheim Fellow
Alexander von Humboldt Award for Senior American
Scientists, Japan Foundation Fellow

Dr. Albert Ando is both a Professor of Economics and the
University of Pennsylvania and a Professor of Finance. He
currently teaches the advanced courses in monetary and fiscal
policy to Ph.D. candidates in Economics. In the past, he has
been in charge of the econometrics program.

Most economists regard Dr. Ando as one of the world's
premier modelers. He has published articles involving the theory
and practice of causal modelling in such prestigious publications
as the American Economic Review, Review of Economics and
Statistics, Bulletin of the Oxford University Institute of
the American Statistical Association. He has authored or co-
authored a number of books on modeling and stabilization policy.
He has attend international conferences on modelling, with some
of the paper he delivered at the conferences appearing in
publications listed below.
Because of his expertise in causal modelling and monetary and fiscal policy, Dr. Ando has received a number of awards and been sought after as a consultant. He has served as a consultant on modelling to the Governments of Japan and Italy, as well as the Federal Reserve Board. Of his awards, the most unusual may be the Alexander von Humboldt Award for Senior American Scientists, an award not usually conferred on economists (or other social scientists) but rather on mathematicians and physical scientists.

Like Dr. Mariano, Dr. Albert Ando had served as a consultant to Dr. Faith Ando on a number of her projects in the area of entrepreneurship by demographic groups.

His papers and publications include:

- "Tests of the Life Cycle Hypothesis of Saving," with F.


on Monetarism, ed. by Jerome Stein, 1975.


- Monetary Policy in Our Time, co-editor, Bank of Japan

- "Interaction between Fiscal and Monetary Policy and the Real Rate of Interest," AEA Papers and Proceedings, 1984 (with Robert Anderson and Jared Enzler).


Mr. Theall is very experienced as a SAS programmer. He maintained and assisted in the analysis of Dr. Faith Ando's data base for the three related studies (mentioned in her resume). The data base was complex, involving self-reported financial information and other data from 1,300 business owners. Of the 250 variables in the data base, about 50 potentially had unusual (outlier) responses. In cases of unusual responses, Mr. Theall pulled the records of the business owner involved. He transformed the variables in the data base, where necessary, into a series of dichotomous dummy variables (Task 2), and he programmed in SAS the information for the various "Portraits" (Task 3). He also entered a price deflator in order to estimate start-up capital in real, not nominal, dollars.
Mr. Theall is an experienced computer programmer. He has worked extensively on the IBM, DEC, and the Univac mainframe in addition to an IBM and DEC personal computer. He has programmed in assembly language and BASIC, as well as FORTRAN. He has utilized the SPSS, SAS, SHAZAM, and TSP statistical packages.
LOREN J. MILLER
B.A., English Literature, Swarthmore College

Mr. Miller is currently the primary resource person on computer languages at the Wharton School of the University of Pennsylvania. In terms of the programming for this project, he is an expert on SAS, being the first choice of students and faculty members on SAS.

Mr. Miller is a computer programmer with more than six years of experience working in a variety of computing languages and for several firms. He has worked extensively on the IBM, VAX, and Prime mainframes in addition to an IBM and DEC personal computer. He has programmed in assembly language, COBOL, Fortran, Pascal, and APL. He has utilized the SAS, SPSS, BMDP, and TSP statistical packages.

Prior to coming to Wharton, Mr. Miller programmed for IBM and Practical Solutions. At IBM, he programmed in IBM/COBOL. At Practical Systems (a computing consulting firm), Mr. Miller programmed in Microsoft/COBOL on a Burroughs B-21.

At the Wharton School, Mr. Miller has programmed for faculty and students; installed a number of system programs on Wharton's VAX 8700; and written several publications for use at the Wharton
School. Among them are:

- BMDP user guide -- BIOMED package for statistics,
- Introduction to VMS command procedures, and
- Introduction to MACSYMA.
General Resource Person

ORIT EVEN-SHOSHAN

M.A., Economics, Hebrew University, Jerusalem
B.A., Economics and Statistics (double major), Hebrew University, Jerusalem

Ms. Even-Shoshan would serve as a general resource person on this project. She worked for 12 years for the Ministry of Finance in Jerusalem as a Senior Research Economist. Highly regarded by Joseph Pechman, she recently moved to the U.S. She holds a valid work permit.

Ms. Even-Shoshan is an economist whose work experience combines economic research and administrative responsibilities. She supervised a team consisting of two economists and two SAS programmers. Her most recent project at the Ministry of Finance involved the building of a family income tax model for Israel. The model was built at the request of the Director General of the Ministry. Prior to this, she developed a family income data base for Israel similar to the Brookings Institution MERGE file.

Ms. Even-Shoshan is familiar with the kind of quick-response effort that would be involved in this research. In Israel, she worked under pressure with time constraints, because she had to come up with answers to income tax questions for policy makers while legislative debates were being conducted.

Ms. Even-Shoshan's publications are:
"Distribution of Family Income and Taxes," (with Yoram Gabbay), Changing Social Policy for Israel.

"Family Incidence of Income and Taxes," The Economic Quarterly, Tel-Aviv, December 1985, and

Several publications in Taxation Quarterly, issues by the Tax Authority, Jerusalem.