CHAPTER IV. METHODOLOGY

The previous chapter provided an explanation of the conceptual model and the empirical model. This chapter provides an overview of methodology that was used to achieve the research objective of this study. The objectives of this study were to develop a conceptual model that explains the relationship between personal financial wellness and worker job productivity and to test a part of the developed model with empirical data. Research questions were to (1) explore the personal financial wellness profile of workers, (2) describe the personal financial wellness changes according to demographic characteristics, (3) examine the relationship between personal financial wellness and financial stressors, (4) examine the relationship between the personal financial wellness and financial stress, (5) explore the worker job productivity profile, (6) examine the relationship between personal financial wellness and worker job productivity, (7) find the relationship between financial stress and worker job productivity, and (8) explore the desired financial education programs. This chapter describes the population and the sample, development of the instrument, procedures used in data collection, data coding, and data analysis.

Population and Sample

The population for this study was clerical workers of a large employer in mid-eastern state. The employer, located in a rural community, has 5,000 workers including 2,800 part-time and 2,200 full-time workers. The workforce ranges from 800 highly educated professionals to 1,000 clerical support staff, and to 400 lower-level wage workers performing maintenance and upkeep. From the total of 2,200 full-time workers, all 966 clerical workers were included in the sampling frame. From the employer's Compensation Plan: Alphabetical and Schematic List of Classes, the clerical workers were delimited to the full-time workers who work in the area of office services. The office services area included the jobs of program support technician senior, program support technician, executive secretary senior, executive secretary, secretary senior, secretary, office services supervisor senior, office services supervisor, office services specialist, office services assistant, office services aide, postal service assistant, postal service aide, and hearings reporter.

Due to the characteristics of the jobs, the total of 18 postal service supervisors and postal service aides were eliminated from the sampling frame because their responsibilities were quite unlike other clerical workers. None of the workers held the job-title of hearings reporter. Therefore the final sampling frame consisted of 948 clerical workers. From this sampling frame, a random sample of 474 was drawn. The sample size was set by considering the anticipated return rate (35 - 40%) and the number of variables in data analysis. To achieve this sample, the stratified systematic sampling method was used (Babbie, 1990; Pedhazur & Schmelkin, 1991). First, the sampling frame was arranged by the class code of workers. The sampling program was set to employ a 1/2 fraction. A random number between 1 and 2 was generated and the worker having that number and every other worker thereafter was selected from the stratified worker list. The number of workers in the sampling frame and the number of workers in the sample are shown in Table 1.

Development of the Instrument

Questions were developed to test the personal financial wellness profile, the relationship between personal financial wellness and productivity, and the effects of financial stress on worker job productivity. The questionnaire included five areas of measures: personal financial wellness, financial stressors, productivity, desired workplace financial education programs, and demographic characteristics.

Each item was developed from previous research and the conceptual background of personal financial wellness and productivity. The questionnaire items designed to measure personal financial wellness consisted of four different scales: subjective perception of personal finance, behavioral assessment of personal finance, objective scales of personal financial wellness, and overall scales of financial situation. The subjective perception of personal finance included eight

Table 1

Components of Job Titles in the Sampling Frame and the Sample

Class code	Number of Workers in Sampling Frame	Number of Workers in the Sample
Program support technician senior	63	32
Program support technician	174	87
Executive secretary senior	31	15
Executive secretary	105	53
Secretary senior	215	107
Secretary	17	9
Office services supervisor senior	2	1
Office services supervisor	12	6
Office services specialist	204	102
Office service assistant	122	61
Office services aide	2	1
Total	948	474

questions in the areas of cash management, credit management, income adequacy, personal financial management, and consumer shopping skills. Behavioral assessments of personal finance included 12 questions in the same areas of subjective perception. The objective scales included solvency measure, amount of emergency funds, amount of monthly credit payments, amount of monthly installment loan payments, amount of savings per month, and amount of retirement contributions per month. The overall financial wellness scales were measured with three different items: satisfaction with financial situation, perceived financial wellness, and feeling about personal financial situation.

The financial stressors were measured by 24 statements concerning personal, family, and financial stress circumstances. The productivity measures consisted of self-reports of productivity change from the previous year, performance ratings from the boss, absenteeism, worker's compensation claims, and work time used for personal financial matters. Respondents were asked to indicate their desired workplace financial education programs from the 12 possible programs. Respondents could also specify other desired programs. The following demographic characteristics were obtained: age, gender, marital status, education, ethnicity, income, number of financial dependents, and housing tenure. The length of employment was obtained as an independent variable that described each respondent's demographic characteristics.

The instrument was reviewed and revised repeatedly after the preliminary draft was developed. The reviews and revisions were made by a graduate advisory committee, graduate faculty, graduate students, and family financial management undergraduate students. Reviewers made comments and suggestions criticizing the clarity of each sentence and direction, readability of items, arrangement of the questions, comprehensiveness of answer categories for the closed-ended questions, format of questionnaire, fonts and type of questionnaire, and researcher bias.

After a series of reviews and revisions, the instrument was pre-tested by thirty-five graduate students and family financial management undergraduate students. The pretest data were coded

for computerized statistical analysis. The Statistical Package for Social Sciences (SPSS) for Windows was used to test the reliability of the scales and correlation. Due to the small number of cases of pretest, the data were duplicated 5 times. According to the pretest results, several items were reworded and clarified. The questions were reorganized to the final instrument.

The final form of the instrument was entitled Personal Financial Wellness Questionnaire (Appendix B). The final instrument was printed front and back (horizontally) on one sheet of 11 X 14 inch white paper. The instrument was folded in half so it consisted of four pages. The Personal Financial Wellness Questionnaire included eight sections in five areas. The first section consisted of eight Likert-type questions of subjective perception of personal finance. The second section included three overall financial wellness scales, one objective measure (solvency measure), and one financial stress measure. The third section was allocated to the 12 Likert-type questions of behavioral assessment of personal finance, and the fourth section included the questions about work time used in the workplace for personal financial matters. Questions about financial stressors were in the fifth section, and the sixth section included objective measures of personal financial wellness. The seventh section was composed of the productivity questions and the last section was allocated to the demographic characteristics questions. The questionnaire items and the variables that each question measures are described in Table 2.

Data Collection

All Virginia Polytechnic Institute and State University research involving human subjects must be approved by the Institutional Review Board (IRB) of the University. Therefore the IRB request form was prepared (Appendix A). This research effort was approved from IRB in December 1997.

Upon research approval, the names and mailing addresses of the sampling frame were obtained from the Personnel Department of the employer. The data were collected January through March of 1998 using a mail survey technique. To increase the return rate, a modified Total Design

Table 2

Variables and Questionnaire Items

Variable	Question Number
Personal Financial Wellness	
Subjective Perception of Personal Finance	1 to 8
Behavioral Assessment of Personal Finance	14 to 25
Objective Scales	
Solvency Measure	12
Reserve Fund	28
Credit Payment per Month	29
Installment Loan Payments per Month	30
Savings per Month	31
Voluntary Supplementary Tax-Sheltered Employer-	32
Sponsored Retirement Contributions	
Overall financial wellness scales	
Satisfaction with Personal Finance	9
Perceived Financial Wellness	10
Feeling about Personal Financial Situation	11
Financial Stressors	27
Financial Stress	13
Productivity	
Self-reports of Productivity Change	35
Performance Rating from Boss	37
Absenteeism	38
Worker's Compensation Claim	39
Work time used for Personal Financial Matters	26
Desired Workplace Financial Education Program	41
Demographic Characteristics	
Gender	42
Marital Status	43
Education	44
Ethnicity	45
Age	46
Household Income	47
Number of Financial Dependents	48
Housing Tenure	49
Length of employment	34

Method (Dillman, 1978) was used. Also, as an incentive to participate, one $100 free drawing was provided to the respondents. To maintain confidentiality, the survey instrument did not have any identification number. A cover letter (Appendix C) that introduced the research study, clarified the purpose of study, identified the confidentiality nature of study, designated the IRB approval, and addressed the need of participation was printed on white 8 ½ X 11 Virginia Tech Personal Finance Employee Education (PFEE) business letter-head paper. The informed consent form (Appendix D), required by IRB, was printed on white 8 ½ X 11 paper. The cover letter and the Informed Consent form were placed in 8 ½ X 11 manila envelopes with the survey instrument. One stamped return envelope and an index card for entering the free drawing were also stuffed in the envelope. A total of 474 instrument packets were mailed on the 28th of January, 1998.

Follow-up mailings are regarded as an effective way for increasing return rates in mail surveys (Babbie, 1990). One week after the initial instrument was mailed, a thank-you and reminder note (Appendix E) was mailed. The thank-you and reminder note was printed on yellow 8 ½ X 11 PFEE business letterhead paper with black ink. The follow-up note was folded in half and stapled for sealing. Due to the out-dated nature of some names on the mailing list, 19 workers were deleted from the sample after one week (they were no longer employed by the employer). Therefore 455 thank-you and reminder follow-up notes were mailed on the 4th of February, 1998. After the first follow-up was sent, five workers called the researcher requesting her to resend the questionnaire.

Three weeks after the initial mailing, a second follow-up cover letter and replacement questionnaires were sent to non-respondents. Those who wanted to enter the $100 free drawing submitted their names and addresses with the answered questionnaire. To avoid duplicate mailings to the respondents, their names were deleted from the initial mailing list. The names of terminated workers were also deleted from the mailing list. Since the questionnaire did not have an identification number, those who did not want to enter the $100 free drawing received the second follow-up letter and questionnaire. The second follow-up cover letter (Appendix F)

informed non-respondents that their questionnaire had not been received and appealed for its return. The letter also identified the confidentiality of the study and addressed the need for participation. It was printed on white 8 ½ X 11 PFEE business letterhead paper. The second follow-up cover letter and the Personal Financial Wellness Questionnaire were placed in 8 ½ X 11 manila envelopes with a stamped return envelope and an index card for entering the free drawing. A total of 285 second follow-up packets were mailed on the 18th of February, 1998.

Of the original 474 names and addresses in the mailing list, 27 (5.6%) were returned as undeliverable because of termination of employment, incorrect address, or death. Generally, omitting all those questionnaires that could not be delivered from the sample is accepted (Babbie, 1990). Thus, the initial sample size was reduced to 447 (474 -27). A total of 288 questionnaires were returned by the cut off date. The return rate was 64.4% (288 divided by 447). Among the 288 returned questionnaires, 17 were unusable due to missing information. Therefore, a useable return rate was 60.6% (271/447). Table 3 shows the daily return rate and cumulative return rate. Among the 288 respondents, a total of 204 respondents (70.8%) were entered into the $100 free drawing.

Data Coding

Data from the 271 useable questionnaires were coded into a SPSS for Windows data sheet. The SPSS data sheet has a fixed column format. The first column was for the order in which returned questionnaires were received (this number was also printed in green on the questionnaire as received). From the next column actual data were entered according to the questionnaire question number. Each question was labeled with a variable name. The variable labels are shown in Table 4. All the missing values were coded as 99, and this missing value was defined in the SPSS data sheet program, so the program recognizes 99 as a missing value. The entire coding scheme is in Appendix G.

Table 3

Daily and Cumulative Return Rate

Date Received	Number Received	Number Unusable	Daily %	Cumulative %
1/28/98 First mailing				
1/29/98	1	0	0.2	0.2
1/30/98	25	2	5.6	5.8
2/2/98	45	1	10.1	15.9
2/3/98	21	0	4.7	20.6
2/4/98 (1st Follow-up)	4	0	0.9	21.5
2/5/98	9	1	2.0	23.5
2/6/98	28	2	6.3	29.8
2/9/98	18	0	4.0	33.8
2/10/98	16	1	3.6	37.4
2/11/98	22	0	4.9	42.3
2/12/98	11	0	2.5	44.8
2/13/98	10	1	2.2	47.0
2/16/98	11	1	2.4	49.4
2/17/98	3	0	0.7	50.1
2/18/98 (2nd Follow-up)	2	0	0.4	50.5
2/19/98	5	0	1.1	51.6
2/20/98	16	5	3.6	55.2
2/23/98	18	0	4.0	59.2
2/24/98	3	0	0.7	59.9
2/25/98	2	0	0.4	60.3
2/26/98	2	0	0.4	60.7
2/27/98	2	0	0.4	61.1
3/2/98	2	1	0.4	61.5
3/3/98	2	1	0.4	61.9
3/4/98	3	0	0.7	62.6
3/5/98	2	0	0.4	63.0
3/6/98	3	0	0.7	63.7
3/9/98	2	1	0.4	64.1
3/9/98 cut off date	0	0	0.0	64.1[a]

[a] The total return rate is not 64.4% due to rounding.

Table 4

Variables and Labels

Variable	Label	Value
Subjective Perception of Personal Finance	FA	1 to 4 (8 questions)
Subjective Perception Index	FAT	8 to 32
Behavioral Assessment of Personal Finance	FB	1 to4 (12 questions)
Behavioral Assessment Index	FBT	12 to 48
Objective Scales	FO1 to FO6	
Overall Financial Wellness Scales		
Satisfaction with Financial Situation	FM1	1 to 10
Perceived Financial Wellness Feeling About Financial Situation	FM2	1 to 5
Overall Satisfaction with Financial Situation	FM3	1 to 5
Index	FMT	3 to 15
Financial Stressors	FS1 to FS24	0 to 24
Financial Stress Level	FS	1 to 10
Productivity		
Self-Reports of Productivity Change	P1	1 to 9
Performance Rating from Boss	P2	1 to 5
Absenteeism	P3	1 to 6
Worker's Compensation Claim	P4	Yes/No
Work time used for Personal Financial Matters	WT	Yes/No
Demographic Characteristics		
Gender	Gender	
Marital Status	Marital Status	
Education	Edu	
Ethnicity	Ethnicity	
Age	Age	
Household Income	Income	
Number of Financial Dependents	Number	
Housing Tenure	Housing	
Length of employment	Year	

The data were checked for out-of-range responses using a frequency distribution test. The data were also checked with some computed variables for out-of-range. The out-of-range data were compared with the actual questionnaire and all of the errors were corrected.

Dummy variables

For regression analysis several demographic variables need to be recoded as dummy variables. The coding was accomplished by assigning 1 if the respondent was a member of a group and 0 for nonmembership (Pedhazur, 1982). Because the majority of the respondents were female, gender was recoded as "1" if the respondent was female and "0" if male (GENDERD). The questionnaire included eight categories of marital status: never married, not married but living with significant other, married, separated, divorced, remarried after divorce, remarried after spouse's death, and widowed. Marital status was combined into two groups, single and married. If the respondent was not married but living with a significant other, married, or remarried, he or she was assigned "1" and all other categories were assigned "0 (MSD)." The ethnicity was recoded as "1" if the respondent was white and "0" for all other ethnic groups (ETHND). Homeowners were assigned "1" and renters were assigned "0 (HOUSINGD)."

Reversal of Value Labels

To prevent a respondent from answering all positive numbers on some of the questions, some of the questionnaire items were stated negatively. For example, the value of the statements of subjective perception of personal finance questions was 1= strongly agree, 2= tend to agree, 3=tend to disagree, and 4=strongly disagree. For the negative statements, if the respondents were expected to strongly agree it was coded as "1", for the positive statements it was coded as "4." The following questions from the instrument were reverse coded: 1, 2, 3, 8, 19, 21, 22, 23, 24, and 25 (See Appendix G).

Data Transformation

Some of the variables were computed to create an index. The eight items of subjective perception of personal finance were computed into one index (FAT). The twelve items of behavioral assessment of personal finance were also computed into one index (FBT). The total number of financial dependents (Number) was gained from the sum of the number of each category. Financial stressors were summed into one variable (FST). The work time used for personal financial matters was computed to one variable (WT).

Data Analysis

All analysis were conducted using SPSS for Windows. Descriptive analysis was conducted to describe the characteristics of respondents. To identify the personal financial wellness profile of the sample (research question 1), descriptive analysis was also used.

Correlation and multiple regression analysis were used to explore the personal financial wellness profile change according to the demographic characteristics (research question 2). The regression equation was used to describe personal financial wellness changes by demographic characteristics. The personal financial wellness was measured with 11 different measurements in four areas of the subjective perception scale, behavioral assessment scale, objective scales, and overall financial wellness scales. Therefore a total of 11 regression equations were developed with 11 different dependent variables. The 11 dependent variables were subjective perception index, behavioral assessment index, solvency measure, amount of reserve funds, monthly credit payments, monthly installment loan payments, monthly savings, monthly voluntary supplementary tax-sheltered employer-sponsored retirement contribution, satisfaction with financial situation, perceived financial wellness, and feeling about financial situation.

$$PFW = a + b1\ AGE + b2\ EDU + b3\ GENDERD + b4\ HOUSINGD + b5\ INCOME + b6\ MSD + b7\ NUMBER + b8\ RACED + b9\ YEAR$$

where, PFW: The 11 measures of personal financial wellness

AGE: Age of a respondent in years

EDU: Education of a respondent

GENDERD: Gender dummy variable of respondent, 1 if female, otherwise 0

HOUSINGD: Housing tenure dummy variable of respondent, 1 if home owner, otherwise 0

INCOME: Household income of a respondent

MSD: Marital status dummy variable, 1 if married, otherwise 0

NUMBER: Number of financial dependents

RACED: Ethnicity of a respondent, 1 if white, otherwise 0

YEAR: Length of employment to a current employer

Correlation was examined to examine the relationship between financial stressors and personal financial wellness (research question 3). Correlation was used to examine the relationship between the personal financial wellness and financial stress (research question 4).

Descriptive analysis was utilized to identify the worker job productivity profile in the area of self-reporting productivity change, performance rating, absenteeism, worker's compensation claims, and work time used for personal financial matters (research question 5).

Multiple regression analysis was used to examine the relationship between personal financial wellness and worker job productivity (research question 6). To control the influences of demographic characteristics and financial stressors on the productivity, some of the significant demographic characteristics and financial stressors were included in the regression equation. The significant demographic characteristics and financial stressors were decided by examination of listwise correlations between demographic characteristics, financial stressors, and productivity measures.

Since there were four different productivity measures[a] (self-reports of productivity change, performance rating, absenteeism, and work time used for personal financial matters) and 11 different personal financial wellness measures, 44 different regression equations existed. However, among the 11 measures of personal financial wellness, those measures that showed significant correlations with each productivity measure were entered into the regression analysis. Therefore fewer than 44 different regression equations were tested. The following regression equation was used.

$$\text{Productivity} = a + \Sigma\, bi\, Di + bj\, FST + bk\, PFW$$

where, Productivity: The four different productivity measures (self-reports of productivity change, performance rating, absenteeism, and work time used for personal financial matters)

Di : Selected significant demographic characteristics

FST: Financial stressors index

PFW: Personal financial wellness measures that showed significant correlation with each productivity measure. Each personal financial wellness measure was entered into a different regression equation.

For further discussion of the relationship between personal financial wellness and worker job productivity one-way ANOVA was used.

Correlation was used to explore the relationship between financial stress and worker job productivity (research question 7). Descriptive analysis was used to describe the desired financial education programs in the future of workers (research question 8).

[a] While worker's compensation was hypothesized as a variable that may be associated with job productivity, the skewness prohibits further analysis. Therefore, among the original five productivity measures, the worker's compensation claim was deleted in the regression analysis. A large database and/or different sample might provide useful insight in a future research study.

The alpha level was set at .05 throughout the study. Therefore, the discussion of the results focuses on the findings that are statistically significant at or beyond the .05 alpha level.

Summary of Research Methodology

This study was to design to develop and test a conceptual model that describes the relationship between personal financial wellness and worker job productivity. Personal financial wellness was measured with four scales of subjective perception of personal finance, behavioral assessment of personal finance, objective scales, and overall financial wellness scales. Job productivity was measured with self-reports of productivity change, performance rating, absenteeism, worker's compensation claim, and work time used for personal financial matters.

This chapter described the sample that was studied. It also provided a discussion of the instrument development, the data collection, and the data coding. Finally, the data analysis was presented.