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**IMPACTS OF JOB AND ORGANIZATIONAL SATISFACTION,
AND ORGANIZATIONAL COMMITMENT
ON TURNOVER INTENTION IN THAI PUBLIC SECTOR ENGINEERS**

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ABSTRACT

IMPACTS OF JOB AND ORGANIZATIONAL SATISFACTION, AND ORGANIZATIONAL COMMITMENT ON TURNOVER INTENTION IN THAI PUBLIC SECTOR ENGINEERS

by

Nipha Kittiruengcham

This study addresses the causal linkages between attitudinal determinants of employees' turnover. Using data from a survey of 408 public sector engineers working in sixteen organizations in Thailand, this study examines the relationships of job satisfaction, organizational satisfaction, and organizational commitment with turnover intention. Impacts of various factors, particularly the effect of self-efficacy expectation and pension, are also analyzed on turnover intention. Pearson correlation and path analysis through multiple regressions are conducted for the data analysis. The results are: (1) turnover intention is significantly inversely associated with both job and organizational satisfaction, and organizational commitment: (2) path analysis partially supports that job and organizational attitudes relate differently to job and organizational behavioral intention: organizational commitment is more strongly linked with turnover intention than is job satisfaction: (3) multiple regressions do not confirm the importance of self-efficacy expectation as an independent factor of job satisfaction or the importance of pension as a predicted antecedent of turnover intention.

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TABLE OF CONTENTS

	Page
LIST OF TABLES AND FIGURES	vi
I. INTRODUCTION	1
II. THEORETICAL FRAMEWORK AND HYPOTHESES	
1. Proposed Model	12
2. Theoretical Assumptions	
2.1 Public Sector	14
2.2 Engineers	19
2.3 Turnover Intention	22
3. Hypothesis Summary	
3.1 Hypothesis 1	28
3.2 Hypothesis 2	28
3.3 Hypothesis 3	30
3.4 Hypothesis 4	31
3.5 Hypothesis 5	31
3.6 Hypothesis 6	32
3.7 Hypothesis 7	34
3.8 Hypothesis 8	35
3.9 Hypothesis 9	36
3.10 Hypothesis 10	38
3.11 Hypothesis 11	39
3.12 Hypothesis 12	40

	Page
III. METHOD	
1. Sample	41
2. Procedure	42
3. Instrument Design	42
4. Data Analysis	49
IV. RESULTS	
1. Test of Hypotheses	52
2. Test of Model	
2.1 Proposed Model	55
2.2 Modified Model	58
V. DISCUSSION	71
VI. CONCLUSION	
1. Implications for Theory and Practice	79
2. Implications for Future Studies	83
REFERENCES	86
APPENDIX	
A. Sample Questionnaire	103

LIST OF TABLES AND FIGURES

	<u>Tables</u>	Page
1. Distribution of all Public Employees and Turnover Employees by Education Level in 1995		10
2. Distribution of Turnover Employees (University Degree) by Job Type in 1995		11
3. Demographics of Thai Public Engineer Participants		50
4. Variable Measures, Number of Items and Cronbach's Alpha		51
5. Means, Standard Deviations, Minimum and Maximum Scores		61
6. Pearson Intercorrelations between Variables		62
7. Direct Relationships of Factors on Turnover Intention		63
8. Direct Relationships of Hypothesized Factors on Turnover Intention		64
9. Direct Relationships of Factors on Job Satisfaction		64
10. Direct Relationships of Factors on Organizational Satisfaction		65

Tables

Page

11. Direct Relationships of Factors on Organizational Commitment of Modified Model	67
12. Direct, Indirect and Total Effects of Significant Independent Variables on Dependent Variables	69

Figures

Page

1. Proposed Model of PS Engineers Turnover Intention	13
2. Derived Model of PS Engineers Turnover Intention	66
3. Modified Model of PS Engineers Turnover Intention with Path Coefficients	68

I. INTRODUCTION

Interest in explaining the relationship between employee attitudes and work outcomes has long been of central concern in industrial, psychological and management research (Jackofsky & Peters, 1983; Locke, 1976; Mowday, Porter, & Steers, 1982; Porter, Steers, Mowday, & Boulian, 1974; Shore & Martin, 1989; Wiener & Vardi, 1980). Over the last two decades, considerable studies have been devoted to developing predictive models of voluntary turnover, with job satisfaction, organizational commitment and turnover intention among the most commonly proposed antecedents (Arnold & Feldman, 1982; Bluedorn, 1982; Clegg, 1983; Dougherty, Bluedorn, & Keon, 1985; Hollenbeck & Williams, 1986; Lee & Mowday, 1987; Michaels & Spector, 1982; O'Reilly & Caldwell, 1980; Tett & Meyer, 1993). Individual research has generally supported hypothesized linkages between turnover and these variables. For example, many studies have found that satisfaction and commitment have been inversely correlated with turnover and intent to quit (Arnold & Feldman, 1982; Bluedorn, 1982; Hollenbeck & Williams, 1986). Satisfaction has been indicated to be positively correlated with commitment (Bluedorn, 1982; Clegg, 1983; Dougherty, et al., 1985). In addition, turnover intention has been reported to be the strongest precursor of turnover (Lee & Mowday, 1987; Micheals & Spector, 1982; O'Reilly & Caldwell, 1981).

The major purpose of these studies was to examine the impact of affective responses to work conditions on turnover. Individuals attribute positive and negative qualities to work conditions. Affective responses to objects determine behavior toward

those objects (Fishbein, 1967; Hill, 1981). It is generally assumed that employees with a positive attitude toward some objects perform favorable behaviors and do not perform unfavorable behaviors with respect to those objects. Staying is assumed to mean that employees who stay with their organization have a positive evaluation of the work. Therefore, work attitudes are expected to predict turnover. Understanding how individuals response is pertinent to studies of their quitting the organization.

The purpose of the present study is to focus on public sector employees for several reasons. First, the public sector in most countries is a major employer, including professionals. Despite this growth, most studies have focused on private sector employees; few have focused on public sector employees. Second, from the point of development, public employees play major roles in policy formulation and promote activities of the private sector for the sustainable development and growth. Therefore, if turnover of the valuable public employees significantly increases, it will decrease continuous development of the economic growth. If government organizations have more information about the factors which influence turnover of such professionals, they may develop better human resource planning and management activities which will motivate and retain their valuable employees, and attract new ones to the public sector for the main purpose of the sustainable development. Thai public employees are also substantial as the aforesaid reasons. This study, thus, attempts to investigate what factors influence turnover of Thai public sector employees through an investigation of their work attitudes.

To mainly focus on the different types of affective responses on work outcome, this study adds organizational satisfaction in order to clearly explore the differential relationships that job and organizational-targeted attitudes have with behavioral intention regarding turnover intention. Most studies identify only job satisfaction and organizational commitment and do not consider the influence of organizational satisfaction. Thus, this study attempts to understand the causal relationship between three attitudinal antecedents of turnover intention: job satisfaction, organizational satisfaction, and organizational commitment. Specifically the setting for this study is the Thai federal civil service, with samples of public sector engineers. The implication of this study for the management practice will certainly be fruitful to the Thai public sector to motivate, retain and attract its valuable engineers for the economic growth and competitiveness in the world market. Moreover, this study will provide the extent of research in the area of organizational behavior to another culture, neither a US nor a Western one. It may also be applied to public sectors of countries with cultures similar to Thailand.

1. Problem Statement

Turnover is becoming more severe in the federal civil service. *Leadership for America: Rebuilding the Public Service*, the report of the National Commission on the Public Service, has asserted that the federal civil service is losing high-quality employees due to the declining relative pay and prestige of federal employment. Levine (1986, p. 200) also indicated, "Over the past five years, concern has grown rapidly about the quality, morale, and effectiveness of the federal civil service. Anecdotal and

impressionistic evidence suggests that a serious problem exists and that it seems to be worsening.”

Thailand is also facing the problem of high turnover rate of public sector professionals. They leave the Thai federal service for the private sector: either to start their own firms or to join private companies. A study of Office of the Civil Service Commission (1996) indicates that Thai public professionals have a higher turnover rate than non-professionals (1.8 % for professionals; 0.7 % for non-professionals). One of the most important reasons they quit their positions is that they are paid better (at least double salary) in the private sector.

Although voluntary turnover has both positive and negative consequences on three levels of analysis: individuals, work group, and organization (Mowday, et al., 1982), concern about the negative effects of turnover for organizations has been discussed by a number of writers (Mobley, 1980; Price, 1977; Staw, 1980). The most negative effects are increased administrative costs related to turnover. Turnover typically results in enhanced expenses for human resource management, namely for recruitment, selection, training, and development. Hence, these negative consequences have accelerated a search for more information about factors influencing employee turnover, in the hope that better understanding would guide development of programs causing effective management of turnover in organizations.

To examine the problem of employee turnover, scholars have been interested in investigations into attitudinal measures of factors affecting such behavior. Employees' responses to their employment are substantially attitudinal and may or may not have behavioral demonstrations in the work setting. As with many attitudes, work attitudes may have multiple origins, and variations in intensity and durability, and the task of understanding how and why employees respond to their jobs and organizations thus is increasingly complex. If the organization can understand/predict variation in job satisfaction, organizational satisfaction and organizational commitment, the organization has taken the first step in potentially altering those factors most applicable to repress satisfaction and commitment.

The development of an understanding of work attitudes (job vs. organizational attitudes) in relation to turnover intention may give a clearer picture of what variables cause turnover intention. All jobs provide contexts within which employees perform their jobs. Those contexts and the nature of the work environment's requirements, influence the employee. Therefore, the most clear possible factors of work responses are the nature of the job and the work environment, and a principal concern to be coped with is a measure one.

The attitudes, values and behaviors occupied by employees are promisingly significant factors explaining why they respond to their jobs and organizations (Hopkins, 1983). For instance, individual employees may vary in aspects of their expectations about

their jobs and organizations, the significance of work in their lives, or the way in which they relate to other people.

Several factors directly affect employee's decision to quit or stay with an organization. One determinant of decisions to quit the organization is the employment situation outside of the current organization (Mowday, et al., 1982). Another determinant, studied by Arnold and Feldman (1982), is the perceived job security, a prominent factor influencing employee's decision to remain with the organization and a main role in Thai public sector. This study, thus, will include these two aforementioned factors: external employment opportunity and perception of job security, into the turnover model. Pension will also be included in the study as it plays a key role in the Thai public sector.

In considering the connection between work attitudes (job vs. organizational attitudes) and work outcomes, this study should provide additional insight into the relationships between both work attitudes and affective responses related to turnover intention, since the research in this area is insufficient.

Finally, most research in the area of organizational behavior was conducted in Western countries. There were a few studies that were done outside of the United States subjects. This study, therefore, will extend the research in this area to another culture, Thailand.

2. Purpose of the Study

The purpose of this study is to explore the causal relationship among three attitudinal antecedents and their determinants and their consequences, as well the variables that cause engineers to withdraw from public sector jobs/positions in Thailand. This study focuses on the following questions:

1) Are job satisfaction, organizational satisfaction, and organizational commitment predictors of public sector engineers' turnover intention and turnover? If so, which construct is the better predictor of turnover?

2) Are there relationships among satisfaction with job, organizational satisfaction, and organizational commitment? How do they affect turnover intention? If so, in which direction? Or, are other factors confounding the predicted relationship? Maybe, the job security is not a much influential factor in public service engineers' decisions to remain with Thai government positions. The higher salary in the private sector may more than offset the job security in the public sector.

3. Significance of Thailand

Thailand realizes the importance of public sector professionals because their knowledge contributes significantly to the development of Thailand. Public sector professionals supervise, coordinate, and promote activities of the private sector in order to

develop the economic growth of Thailand and compete with other countries in the world market during the past three decades.

Currently in Thailand, professionals are more likely to leave the public sector than non-professionals. Table 1 shows that the total percentage of employees with university degrees is only 30.4% of all civilian employment, while 69.6% have less than university degree. However, the employees with university degree constitute a higher percentage of turnover civilian employees (52.6% for employees with university degree; 47.4% employees with less than university degree). In addition, the data show 1.8% of all employees with university degree turnover their employment with the civil service in contrast to 0.7% of all employees with less than university degree in 1995.

Regarding occupations, engineers are more likely to leave Thai public sector jobs than others. Table 2 shows the breakdown of different jobs held by civilian employees and the turnover rate by job types in 1995. Engineers constitute the highest percentage of all turnover employees (2.46%).

A study of Office of the Civil Service Commission (1996) reports that one reason Thai public employees including engineers quit their job is that employees have little opportunity of advancement because of the appraisal based on seniority. Second, they cannot see the results of their jobs due to the inefficient workflow and the complex bureaucratic system. Third, they also perceive to be unfairly promoted because of their supervisors' evaluation based on the close relationship, not individual competence. This

deteriorates their morale and determination for being in the Thai civil service. Some indicate that supervisors do not accept their subordinates' ideas and suggestions, nor do they have personal relationships with their subordinates. Fourth, lower salaries, relative to both state enterprises and the private sector, urge such employees to leave the Thai public sector. The private sector offers at least double the salary that attracts employees, especially young employees. Finally, the job characteristics of the federal civil service are not challenging nor creative. They lack the core job dimension of Hackman and Oldham's (1975) Model.

Since the study of Office of the Civil Service Commission (1996) has examined which factors have caused Thai turnover employees to leave their positions based on the Motivation-Hygiene factors of Herzberg (1966); this study concentrates on the causal relationships between three attitudinal antecedents of turnover through turnover intention of specific samples- job satisfaction, organizational satisfaction and organizational commitment. This study uses two types of technique to test the hypotheses, and proposes a causal model of public sector engineers. Pearson correlations and path analyses are used. The results are expected to increase our understanding of: (1) the linkages among work attitudes and some of their determinants and consequences; and, (2) the causes of turnover engineers that lead to the better management programs in order to keep engineers in their positions and attract new ones to the Thai public sector.

Table 1: Distribution of all Public Employees and Turnover Employees by Education Level in 1995

Education Level	All Employees		Turnover Employees		Turnover as Percentage of Total Employees
	Number	%	Number	%	
University Degree	96,906	30.39	1,784	52.61	1.84
Below University Degree	221,980	69.61	1,607	47.39	0.72
Total	318,886	100.00	3,391	100.00	

Source: Office of the Civil Service Commission, Thailand, 1996

Table 2: Distribution of Turnover Employees (University Degree) by Job Type in 1995

Job Type	Turnover Employees	Number of Employees	Turnover as Percentage of Total Employees
Administration, Statistic, Legislature, Foreign Affairs	715	76,430	0.94
Revenue, Economic Commercial, Industrial	494	46,932	1.05
Transportation, Communication	94	7,131	1.32
Agriculture	124	26,805	0.46
Science	45	2,861	1.57
Health Service	1,364	104,435	1.31
Engineering	68	2,760	2.46
Architecture, Technician	232	26,504	0.88
Education, Art, Social Service Community Development	255	25,028	1.02
Total	3,391	318,886	1.06

Source: Office of the Civil Service Commission, Thailand, 1996

II. THEORETICAL FRAMEWORK & HYPOTHESES

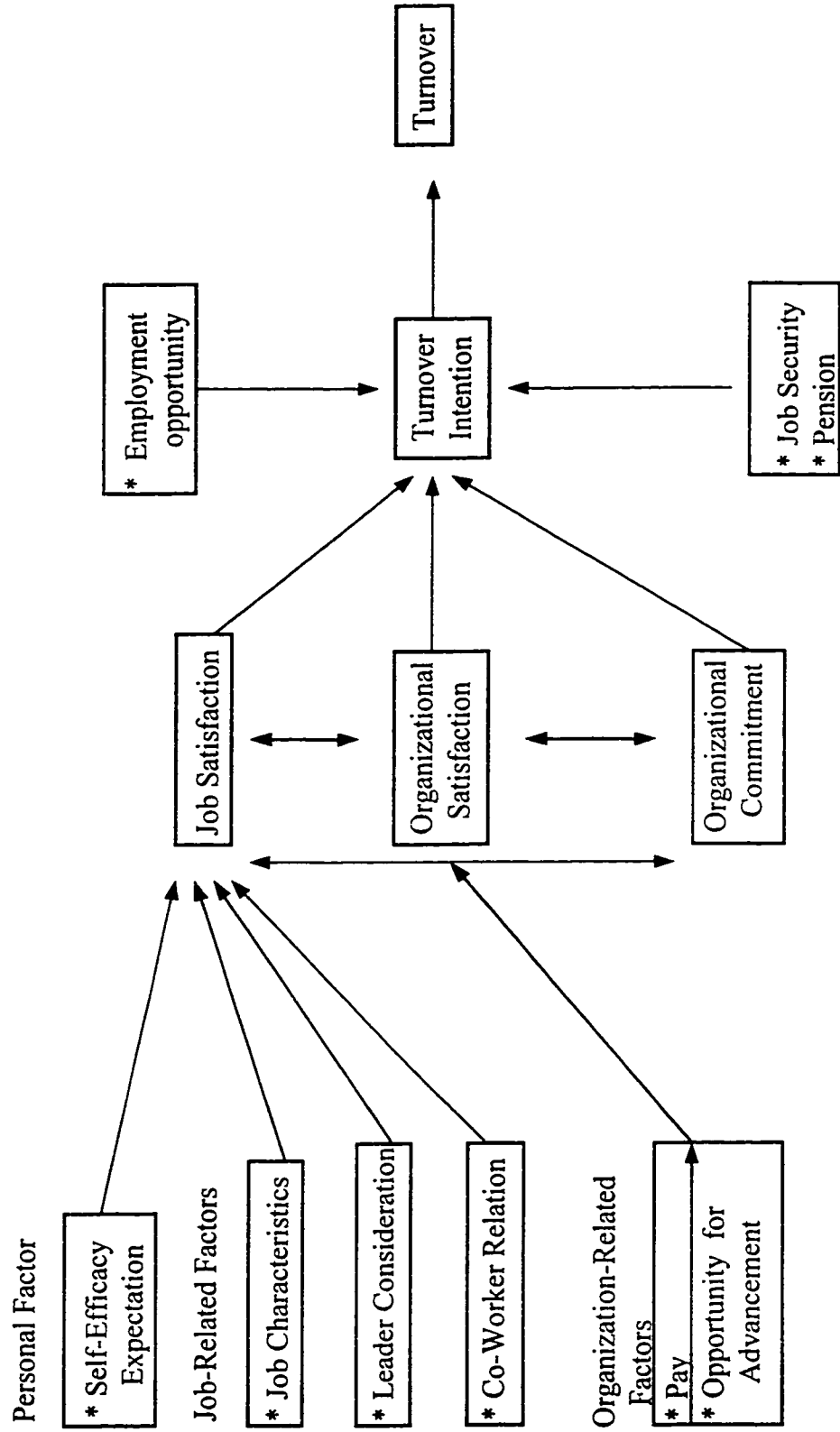
This study examined the reactions of public sector engineers to job and organizational attitudes. Further, the impacts of both job and organizational satisfaction and organizational commitment on turnover decision were investigated in the Thai public service. This section begins by defining a proposed model. This is followed by an analytical framework.

1. Proposed Model

A model of public sector (PS) engineers' turnover intention is presented in Figure One. The model is based upon the results reported in previous studies and includes the specific factors that are hypothesized to directly influence turnover intention, job satisfaction and organizational satisfaction. Following the suggestions of Tett and Meyer (1993) concerning ordering of the intervening variables and Shore, Newton, and Thornton (1990) regarding job and organizational attitudes differently related to job and organizational behavioral intention, the proposed model specifies how job satisfaction, organizational satisfaction and commitment each independently contribute to the prediction of turnover intention.

Figure 1

Proposed Model of PS Engineers Turnover Intention



2. Theoretical Assumptions

2.1 Public sector

In order to clearly understand the public sector, it may be helpful to compare the public sector with the private sector. On the basis of the public-private distinction, Perry and Rainey's (1988) review of the literature outlines a variety of definitions of the public sector.

1) *Based on the Public Interest.* One of the definitions of Public Interest approach regards the impact the organization has on the public interest as the basis for the definition. For instance, Blau and Scott's (1962) *cui bono* typology designates a category of welfare organizations whose principal beneficiaries are generally the public. These welfare organizations are different from business organizations whose principal beneficiaries are their owners. Nevertheless, the Public Interest has been notoriously complicated to define and measure. Mitnick's (1980) study discussed these complications, and proposed a typology indicating that there were multiple, sometimes disputing, conceptions of the public interest.

2) *Based on Public Goods and Market Failures.* Economists express public goods and market failures as reasons for government activity, and thus as reasons for the existence of public bureaucracies (Breton & Wintrobe, 1982; Downs, 1967). These concepts, however, inadequately define public organizations. Supporters of privatization

of public services debate that several public organizations are creating nonpublic goods (Savas, 1982).

3) *Based on Ownership/Funding.* The most prevalent definition of public and private organizations regards ownership and/or funding. For instance, property rights theorists (Alchian & Demsetz, 1972; Demsetz, 1967) consider ownership as a distinct difference between private and public organizations. For public organizations, ownership rights cannot be transferred among individuals, and thus risk is extremely diffused. Perry and Rainey (1988) indicates that management in the private sector is regarded as a productive input, and is efficiently valued in the market; the distribution of managerial ability among organizations has little correspondence to its value as a productive input in the public sector.

In the Schneider and Vaught's (1993) review, another perspective of the public-private organizations is that differences are found when comparing four types of organizations. Fottler (1981) proposed a comparative analysis of four organization prototypes: private for-profit, private non-profit, private quasi-public and public. Based on his study of these four organization classes, Fottler (1981, p.10) explained that "it would be inappropriate to conclude that the differences between the four sectors are significant; however, the public sector does appear to exhibit some significant differences in the conditions and constraints under which management processes are conducted, when contrasted to the private for-profit sector."

Historically, the public and private sectors have been considered as different, nevertheless diverse opinions have appeared regarding the existence of both similarities and differences. Similarities between the two sectors mainly concentrate on a commonality of general management functions (Allison, 1983; Murray, 1983). Whether public or private, management includes setting up an organizational purpose and developing objectives; planning; selecting, managing, and motivating personnel; and controlling organizational and personnel performance.

Much of previous research has compared public and private sector employees. Hall (1972), Utgoff (1983), and Ippolito (1987) found that federal employees were less likely to quit or to be laid off than private employees. In regard to job satisfaction, Bogg and Cooper (1995) found that senior U.K. civil servants were significantly more job dissatisfied than their private sector counterparts. Rainey, Backoff, and Levine (1976) also concluded that public employees had lower job satisfaction than private sector employees. Another study by Buchanan (1974) also supported prior research that private sector organizations provided a better job of creating job satisfaction and commitment among middle managers. Moreover, recently, researchers (e.g. Steel & Warner, 1990) investigated the level of job satisfaction among a national cross-section of early labor force participants in the public and private employment sectors in the late 1980s. They found that public sector employees manifested significantly higher levels of job satisfaction than their private sector counterparts.

Studies which have examined why public and private sector employees stayed on the job in terms of the work situation have found contradictory findings. Flowers and Hughes (1973) indicated that low-skill manufacturing workers remained on the job due to environmental reasons, namely benefits, personal friendships, financial pressures, and loyalty to the company. Professionals and managers remained due to their nature of work and work environment. The study of public sector employees by Dodson and Haskew (1976), however, found that environmental factors, namely benefits, family responsibilities, department loyalty and concerns about locating other employment were more important pressures than their nature of work for remaining in the managerial level.

Previous studies investigated the influence of pay satisfaction on turnover compared to the private sector. Furthermore, there has been an increasing concern among public officials that declining pay and negative stereotyping of federal employees have caused a decrease in job satisfaction, performance and turnover (Lewis, 1991). This has led to the destruction of both morale and quality of the federal service, and difficulty of selecting, attracting and sustaining high-quality employees.

Rainey, Backoff, and Levine (1976), however, found that public sector employees were less responsive to monetary incentives than private sector employees, and they valued job security more highly. They also suggested that declining pay would have less effect on morale in the public than in the private sector. This may explain that pay may not be the essential factor in federal job satisfaction and public employees consider

favorable nonmonetary attributes of public sector employment, namely superior job security, pension plans and working conditions.

In particular, few surveys have focused on public sector employees' work-related attitudes and turnover. Studies reviewed employees' satisfaction with their work based on the aspects of the work situation. Hopkins' (1983) study found that state employees from five states were somewhat satisfied with their jobs. Those who were most satisfied classified largely intrinsic characteristics about their jobs regarding the nature of work (e.g. job quality, job effort) and extrinsic characteristics regarding the work environment (e.g. supervision, promotion, income). These findings were in accordance with Costello and Lee's (1974) study which concluded that the public sector professionals were satisfied with security and the social aspects of their jobs.

With reference to the issues of turnover and turnover intention, a number of studies reported a negative relationship between job satisfaction and turnover intention of professionals in public accounting (Arnold & Feldman, 1982; Bullen & Flamholtz, 1985; Rasch & Harrell, 1990). A significant negative relationship between organizational commitment and turnover intention of a large sample of public accountants was presented in Meixner and Blin's (1989) study. In addition, Meyer, Beville, Magedanz, and Hackert (1979) reviewed factors affecting turnover of South Dakota state employees. Work attitudes toward the employment, namely salary, supervision and accomplishment of organizational goals, career development, job satisfaction and work facilities, are expressed as important factors bearing upon turnover.

2.2 Engineers

During the past several decades the term *engineer* has been subject to a great variety of meaning. The literature review of Kerr, Glinow, and Schriesheim (1977) indicated the definition of engineers. They noted that Newell (1922) viewed an engineer as a mechanic, a tradesman, or a professional man. Newell (1922) also suggested that the term *engineer* was not obviously defined because of the breadth of division among groups. Nevertheless, he cited that engineering was “a profession in the same sense that pure mathematics is a science” (Newell, 1922, p.79), even though engineers need have no education. This term of engineers is in accordance with some researchers (e.g. Harlow, 1973), whereas inconsistent with others (e.g. Strauss, 1963; Perrucci & Gerstl, 1969) that engineers can be generally considered to be “partly” professional. Although Kerr, et al. (1977) argues that most engineers lack several aspects of professionalism namely autonomy, commitment, identification, ethics and standards, this identification *professional* is commonly used for engineers.

Kerr, et al.’s (1977) review also provided the various definitions of engineers as follow:

- 1) Badawy (1971) stated those involved in engineering work at a level which demands a knowledge of engineering science equivalent at least to that required in a four-year college course, with a major in a certain field of engineering.

- 2) Miller and Wager (1971) stated those with a master's degree in engineering.
- 3) Ritti (1968) stated those who obtain engineering degrees and who work as engineers.
- 4) Shepherd (1961) stated those identifying their work specialty as some form of engineering.
- 5) Becker and Carper (1956) stated those with a major field in engineering.

A significant development in the composition of the labor force in both industrialized and newly industrialized countries is the tremendous increase in the number of professionals including engineers. A high proportion of studies which comprise the literature on professionalism have employed samples of professionals including engineers on the assumption that members of these occupational specialties were obviously professionals (Farris, 1974; Greene & Organ, 1975; Hall & Mansfield, 1975), however, few studies have investigated public sector professionals from all fields. The reason why these studies have been interested in public sector professionals is that government is the largest employer of these professionals (Cherniss & Kane, 1987). This is also true in Thailand. The effectiveness of government is dependent on the effectiveness of the professionals it employs. Cherniss and Kane (1987) found that public sector professionals reported significantly lower values on each job characteristic than public sector blue-collar workers. Public sector professionals' work involvement was also lower than blue-collar workers', and their score on work motivation was not higher. The Office of the Civil Service Commission (1996) indicated that both professionals and non-

professionals valued the job characteristics of the Thai public sector in the absence of the core job dimension of Hackman and Oldham's (1975) model.

Additionally, there is no significant difference between the two groups in either job satisfaction or intrinsic need satisfaction. The empirical study by Emmert and Taher (1992) supported that job satisfaction and work involvement were lower than those of blue-collar workers, and work motivation was no higher than that of blue collar workers. These findings contradicted some studies in organizational behavior literature and raised questions about the nature of public sector work.

Previous studies on work attitudes and turnover have been made concerning engineers. In one study, 640 engineers who had left their employment were found to differ from 720 engineers who stayed (Behavioral Research Service, 1962). The second study indicated that 18 engineers who left a company had significantly less favorable attitudes than 18 engineers who stayed regarding help received from the manager, effect on job goals, agreement on job goals, and performance appraisal and salary discussions (Behavioral Research Service, 1964). In the study of work values among 432 employees including 52 engineers in 2 industrial companies in Israel that manufactured electronics equipment, Shapira and Griffith (1990) found that performance of engineers was related more to intrinsic work value, namely pride in work, than to extrinsic value, namely attitudes toward earning.

This study focuses on Thai public engineers for two reasons. One reason is that graduated engineers are the most inclined to leave Thai public sector positions (Table 2). Although the Office of the Civil Service Commission's (1996) study gave general reasons for Thai public employees quitting their position, it did not provide specific reasons for engineers, in particular. Thus, this study is interested in examining why the engineers are less satisfied with job and organization, or are less committed to the organization, and finally are more likely to quit their positions. Another reason is that Thailand needs research and technological capacity which is a powerful force to achieve economic development, such as sustainable export-led growth and enhanced industrial competitiveness. Engineers are one of the most key human capital for research and technological development by transforming new knowledge and developing Thailand's own technology capability. Economic development of Thailand will become stagnant if the turnover of the engineers significantly increase in the Thai public sector. In sum, if turnover of Thai public engineers could be predicted in advance from information about certain factors, then public organizations would be able to better control turnover (withdrawal behavior) and develop programs in order to reduce the engineers' turnover.

2.3 Turnover Intention

Existing research has consistently shown turnover intention as the single best indicator of an individual's actual turnover behavior (Arnold & Feldman, 1982; Cotton & Tuttle, 1986; Rasch & Harrell, 1990). Steel and Ovalle's (1984) meta-analysis suggested that turnover intention and turnover were related and that turnover intention was better

than affective variables, namely job satisfaction and organizational commitment, in predicting turnover. This also suggested that turnover intention was a valuable concept as it was linked with actual turnover behavior.

Satisfaction and commitment have invariably been reported to be inversely related to turnover and turnover intention (Arnold & Feldman, 1982; Bluedorn, 1982; Hollenbeck & Williams, 1986), and positively related to one another (Bluedorn, 1982; Clegg, 1983; Dougherty, et al., 1985).

Research has also compared the independent and joint impacts of job satisfaction and organizational commitment on turnover intention. Arnold and Feldman (1982) indicated that both satisfaction and commitment correlated significantly with turnover intention, even though organizational commitment showed the stronger relationship. Peters, Bhagat, and O'Connor (1981) also found that organizational commitment was associated more strongly with turnover intention than job satisfaction, even though satisfaction did make an independent contribution to the prediction of turnover intention. Hom, Katerberg, and Hulin (1979) compared organizational commitment with facet satisfaction, and reported that organizational commitment was a better predictor of intention to re-enlist in the National Guard.

Several authors (e.g. Peters, et al., 1981; Shore & Martin, 1987; Shore, et al., 1990; Williams & Hazer, 1986) have suggested that attitudes toward the organization were more strongly related to turnover intention than attitudes toward the job. Research

also showed that organizational attitudes alone were related to turnover intention (Angle & Perry, 1981; Mowday, Steers, & Porter, 1979; Steers, 1977). Nevertheless, a number of studies have shown a relationship between turnover intention and overall satisfaction. Tett and Meyer (1993) found that turnover intention was predicted more strongly by satisfaction than by commitment, and satisfaction and commitment each contributed independently to the prediction of turnover intention. Perhaps job satisfaction was related to turnover intention as indicated by the high correlation between job and organizational attitudes (Angle & Perry, 1981; Mowday, et al., 1979).

Although there is little argument with reference to the fact that organizational commitment and job satisfaction are strongly related to turnover or turnover intention (Cotton & Tuttle, 1986; Sorensen, 1990), the specific ordering of those two independent variables in a model of turnover is not obviously understood. Research findings on this issue have been mixed (Bateman & Strasser, 1984; Curry, Wakefield, & Mueller, 1986; Dossett & Suszko, 1990; Farkas & Tetrick, 1989; Lance, 1991; Williams & Hazer, 1986). Locke and Latham (1990) identified studies that supported commitment as a cause of satisfaction, studies that provided no support for a causal interpretation in either direction, and other studies in which job conditions caused satisfaction that in turn contributed to commitment.

Most models of turnover assumed that greater job satisfaction led to greater organizational commitment (Bluedorn, 1982; Marsh & Mannari, 1977; Mobley, 1977; Price & Mueller, 1981). Williams and Hazer (1986) indicated that their data confirmed

the link from satisfaction to commitment. Along with an empirical test of the ordering of satisfaction and commitment in relation to turnover intention for auditors and accountants, Gregson (1992) indicated that the model with satisfaction as an antecedent to commitment did a better job of predicting turnover than the model with commitment as an antecedent to satisfaction.

However, recently researchers conducted a three-year longitudinal study to investigate the causal relationship among these variables (Wong, Hui, & Law, 1995). They found that commitment predicted both satisfaction and turnover intention, whereas satisfaction had no predictive power over the other antecedents. This is in agreement with prior relationship research that organizational commitment is a more immediate predictor of turnover intention than job satisfaction (Bateman & Strasser, 1984; Vandenberg & Lance, 1992). In other cases, satisfaction had no effect on either organizational commitment or turnover intention, perhaps previous research did not consider the intervening effects of these attitudinal variables on the relationship between other antecedents and turnover. It considered only job satisfaction but not organizational commitment.

Most of the aforementioned studies were conducted with US subjects, however, a very few studies investigated the relationships of work-related factors with attitudinal antecedents and turnover intention in different cultural settings, non-US countries. For instance, Baba, Galperin, and Lituchy's (1997) study found that work-related factors were fairly linked to turnover intention among 119 nurses in the Caribbean. In the study of

work attitudes among 150 employees working in a national carrier in a developing country in Asia, Jamal and Preena (1997) indicated that both organizational commitment and job satisfaction were significantly associated with job stress. With regard to job satisfaction, Abu Ajamieh, Misener, Haddock, and Gleaton's (1996) study found that job satisfaction was significantly related to the demographic characteristics of marital status among 330 Palestinian nurses in the West Bank. Another study by Jansen, Kerkstra, Abu-Saad, and Van Der Zee (1996) indicated that both job characteristics and individual characteristics were associated with job satisfaction and burnout of 402 nurses in The Netherlands.

Drawn from these studies (Arnold & Feldman, 1982; Mobley, Griffeth, Hand, & Meglino, 1979; Shore, et al., 1990) with two additional variables in this study, turnover behavior is affected by several variables: (1) personal factor (self-efficacy expectation); (2) job-related factors (perceived job characteristics, leader consideration and co-worker relation) which affect job satisfaction; (3) organization-related factors (perceived pay and opportunity for advancement) which affect organizational attitudes in satisfaction; (4) external employment opportunity; (5) perceived job security; and, (6) pension. Each of these relationships is explored separately below.

Job Satisfaction

Job satisfaction refers to a pleasurable or positive attitudinal orientation based on the results of an appraisal of one's job or job experience that meet or exceed the employee's expectations (Locke, 1976; Price, 1977; Vandenberg & Lance, 1992).

Prior studies in organizational behavior tended to concentrate on job satisfaction as the core attitude in relation to turnover (Locke, 1976). Empirical research has dealt with the link between job satisfaction and turnover intention. Overall job satisfaction appeared to be associated with turnover intention (Angle & Perry, 1981; Bedeian & Armenakis, 1981). Studies of facet measures of job satisfaction also have reported significant association between turnover intention and satisfaction with work itself (Hom, et al., 1979; Kraut, 1975; Waters, Roach, & Waters, 1976) and with promotion (Hom, et al., 1979; Waters, et al., 1976).

Michaels and Spector (1982) indicated that job satisfaction was inversely associated with one's intention to leave a specific job. Sorensen (1990, p.335) suggested that the "inverse relationship between job satisfaction and turnover has been strongly supported by industrial psychology research." In sum, employees who are more satisfied with their jobs are less prone to quit their positions than those who are less satisfied.

With respect to Thai public engineers who hold the high level of job satisfaction, it is proposed that,

Hypothesis 1: The higher the job satisfaction of Thai public engineers, the lower will be their turnover intention.

Organizational Satisfaction

Organizational satisfaction is found to be linked to turnover intention (Shore, et al., 1990). Several studies suggested that attitudes toward the organization were more strongly related than attitudes toward the job in the employees' decisions to leave the organization. Thus, the organizational attitude- organizational satisfaction, may strongly relate to the organization-oriented outcome of turnover intention, whereas the job attitudes may have a strong relationship with the task-oriented outcomes including performance intention (Shore, et al., 1990). In sum, individuals who are more satisfied with their organization are less likely to quit their positions than those who are less.

This study concentrates on organizational satisfaction directly associated with Thai public engineers who are more satisfied related to staying in the public sector. It examines,

Hypothesis 2: The higher the organizational satisfaction of Thai public engineers, the lower will be their turnover intention.

Organizational commitment

Organizational commitment refers to a desire to remain an employee of the organization (Mowday, et al., 1982). Meyer and Allen (1991) identified three conceptualizations of organizational commitment. One major approach is to view commitment as affective or attitudinal. *Affective* commitment pertains to the relative strength of an individual's identification with and attachment to a particular employing organization and is consequently motivated to act on its behalf (Mowday, et al., 1982). An individual who is committed to the organization will, therefore, maintain membership to pursue its goals. Another view of organizational commitment is *continuance* commitment (e.g. Becker, 1960) that is regarded as behavioral rather than attitudinal. An individual is bound to an organization through recognized and accumulated interests (e.g. pension, seniority) rather than favorable affection toward an organization. The third type is *normative* commitment (Wiener, 1982) that refers to a willingness to stay with an organization by reason of a sense of moral obligation.

A number of studies investigated organizational commitment as an important attitudinal predictor of employee intention and behavior (Ferris & Aranya, 1983; Hom, et al., 1979; Mowday, et al., 1979; O'Reilly & Caldwell, 1981; Steers, 1977; Stumpf & Hartman, 1984; Wiener & Vardi, 1980). More research confirmed that organizational commitment had a significant inverse impact on the individual's turnover (actual or intended) for employees in differing types of organizations (Abelsen, 1987; Dailey & Kirk, 1992; Michaels & Spector, 1982; Williams & Hazer, 1986).

This study focuses on *continuance* commitment directly relating to Thai public engineers who recognize high sunk costs associated with leaving the government sector. According to Meyer and Allen's (1984) argument, the measure used to test Becker's idea regarding accumulated cost was saturated with affective commitment, and hence did not allow for an appropriate test of side-bet perspective. The following hypothesis is investigated,

Hypothesis 3: The higher the organizational commitment of Thai public engineers, the lower will be their turnover intention.

External Employment Opportunity

An important external factor which may affect employees' decisions to quit their jobs is the employment situation outside of the current organization. Michaels and Spector (1982), Mobley (1977), and Steers and Rhodes (1978) all advocated that the alternative employment opportunity should be included as a variable in examinations of turnover and commitment. Quarles (1994) found a significant indirect relationship between turnover intention and external employment opportunity through organizational commitment. Cotton and Tuttle (1986) reported that turnover was greatly constantly correlated with the individual's perception of outside employment opportunity. In sum, the employees' perceptions of a high level of external employment opportunity are related to increased desire to leave their jobs. Concerning Thai public engineers with the high level of perceived external employment opportunity, the following hypothesis is tested,

Hypothesis 4: The greater the number of perceived external employment opportunity, the greater will be the turnover intention of Thai public engineers.

Job security

Perceived job security is a major factor in the employee's decision to remain with the organization. Perception of job security stems from Arnold and Feldman (1982), where they stated that the perceived job security was a significant individual predictor and directly related to turnover behavior. In sum, individuals who perceive a high level of job security are less likely to leave their positions.

Job security is aimed to be directly associated with Thai public engineers with high perceptions of job security related to remain with the public sector. This study, therefore, examines,

Hypothesis 5: The greater the perception of job security, the lower will be the turnover intention of Thai public engineers.

Pension

Pension is one of economic factors which affect turnover. Despite several studies showed that pension had little or no impact on turnover and voluntary separation did not appear to be influenced by the absence or existence of pension plans, pension is still the

important nonsalary benefit available to federal employees. Today, Thai federal civilian employees receive pensions from the government based upon the number of years of service, and on salary. Thus, this variable should be related to an individual's decision to leave the Thai public sector. This study tests,

Hypothesis 6: The greater the perceived pension of Thai public sector engineers, the lower will be their turnover intention.

Personal Factor

A main personal factor that is related to turnover intention and job satisfaction is self-efficacy expectation. This variable is explored below.

Self-Efficacy Expectation

Self-efficacy can be defined as an individual's appraisal of her or his capability of performing well task (Bandura, 1977). It influences an individual's expectation about her/his ability to perform successfully in task situations. Self-efficacy expectation is directly associated with an individual's perception of her/his success in dealing with task. Hence, the skills and knowledge that an individual has acquired through past experience may also influence how she/he can do task.

Self-efficacy is an important determinant of success, goal directed behavior. According to Kanfer (1990), self-efficacy refers to complex cognitive judgments about one's future capabilities to organize and execute activities requisite for goal attainment. If

an employee bases her/his self-efficacy on task performance, success on task will be much more substantial to that person than to a person who does not base self-efficacy on success. Locke, Frederick, Lee, and Babko's (1984) study indicated that self-efficacy beliefs were strongly related to behavioral achievement. Some research found the relation of self-efficacy and goal to task performance (Locke, et al., 1984; Wood & Locke, 1987).

The desire to accomplish task well is related to work satisfaction. Several studies found that a sense of achievement was a critical source of work satisfaction (e.g. Harris & Locke, 1974; Locke & Whiting, 1974). Among college professors, Locke, Fitzpatrick, and White's (1983) study indicated that a work achievement factor concerning use of skills and abilities, feelings of accomplishment and success, was significantly associated with three criterion factors: total job satisfaction, intended tenure and job involvement. Thus, it is possible to identify a direct link of self-efficacy with job satisfaction. That is, an employee with a high self-efficacy expectation is more satisfied with job than is an employee with a low self-efficacy expectation.

On the basis of Bandura's (1977) concept, this study examines general self-efficacy that explains the extent to which the expectation is generalized across situations. This concept is also viewed by personality researchers as a generalized trait. Sherer, Maddux, Mercandante, Prentice-Dunn, Jacobs, and Rogers (1982, p.664) cited evidence that "the experiences of personal mastery that contribute to efficacy expectancies generalize to actions other than the target behavior." They reasoned that "individual differences in general self-efficacy expectancies exist and that these generalized

expectancies should influence the individual's expectations of mastery in the new situation." Other dimensions of self-efficacy are magnitude and strength. Magnitude refers to the level of task difficulty that an individual believes she/he can attain. Strength presents whether the conviction concerning magnitude is strong or weak.

Regarding Thai public engineers with a high level of self-efficacy expectation, the following hypothesis is presented,

Hypothesis 7: The higher the self-efficacy expectation, the higher will be the job satisfaction of Thai public engineers.

Job-Related Factors

Three important job-related factors that are associated with turnover and satisfaction are job characteristics, leader consideration and co-worker relation. These variables are defined below.

1) Job Characteristics

Job characteristics required for the successful performance of an individual's particular job have long been thought to be a significant determinant of her/his decision to remain with and participate in the employing organization. Job characteristics refer to the degree to which the inner design of a job has skill variety, task identity, task significance, autonomy and feedback (Hackman & Oldham, 1980). They are the variables which

characterize the job, and are directly related to overall satisfaction (Fried & Ferris, 1987; James & Tetrick, 1986; Loher, Noe, Moeller, & Fitzgerald, 1985; Michaels & Spector, 1982). Job characteristics were also related to turnover (McEvoy & Cascio, 1985). Kraut's (1975) study indicated that job attitudes affecting the work itself were very substantial in determining the employees intention to stay in an organization. Satisfaction with work itself exhibited a consistent negative correlation with turnover (Hom, et al., 1979; Jackofsky & Peters, 1983; Koch & Rhodes, 1981; Koch & Steers, 1978; Kraut, 1975; Mobley, et al., 1978; Waters, et al., 1976). In sum, employees who remain with the organization perceive jobs more closely aligned with their expectations, while those who leave perceive increasing disparity between individual expectations and the realities of the job.

With regard to Thai public engineers with the high perception of job characteristics, this study explores,

Hypothesis 8: The higher the perceived characteristics about the job, the higher will be the job satisfaction of Thai public engineers.

2) Leader consideration

Leader relation is a significant factor involved in employees' decisions to withdraw. Several studies have indicated that leadership was positively associated with job satisfaction and was inversely related to turnover (Dreher & Dougherty, 1980; Graen

& Ginsburgh, 1977; Hom, et al., 1979; Jackofsky & Peters, 1983; Koch & Steers, 1978; Krackhardt, McKenna, Porter, & Steers, 1981; Parasuraman, 1982).

Leaders can be characterized by the degree to which they are considerate subordinates' needs. One dimension of leader behavior, Consideration, is included to measure the leader relation in this study. As the findings of Hofstede (1980) regarding the cultural dimension of Femininity/Masculinity, Thailand has a medium to high value on femininity. This means that Thai society emphasizes values such as warm relationship and quality of life. It is possible that some engineers may be satisfied with the Thai public sector because of the warm and good relationships with their supervisors.

Leader consideration refers to leader behavior in which the leader creates a supportive environment of respect and warmth, friendliness and mutual trust, and helpfulness by doing such things as being friendly and approachable, and looking out for the personal welfare of the group. Michaels and Spector's (1982) study found that leader consideration was directly related to job satisfaction. If Thai public engineers' expectations concerning perceived consideration by the leader are not met, the tendency to quit their positions increase. Hence, this research investigates,

Hypothesis 9: The higher the perception of leader consideration of Thai public engineers, the higher will be their job satisfaction.

3) Co-Worker Relation

One important consideration in turnover is co-worker relation. Such relation can provide support and reinforcement essential for adjustment and attachment to the work environment. On the other hand, failure to secure such support may result alienation from the workplace. Because of the potential significance of such a factor, it should confirm effectively to examine the relation of co-workers to employees' decisions to stay with or quit their employing organization.

Significant correlations between satisfaction with co-workers and turnover have been found. Koch and Steers (1978) found such finding in their study of public sector employees. In addition, in Porter, et al.'s (1974) study of psychiatric technicians, they found that perceived equity of the social aspects of their jobs was significantly and indirectly associated with turnover. Similar findings have also been exhibited by Telly, French, and Scott (1971) among production workers, and by Hulin (1968) among clerical workers.

However, a number of studies reported no significant results of peer group relations and turnover. Hom, et al. (1979) studied actual enlistment behavior among guard members and found that satisfaction with co-worker relations was unrelated to reenlistment. Mobley, et al. (1978) also found satisfaction with co-worker relations was unrelated to turnover in their sample of hospital employees. This may explain that satisfaction with a specific factor does not have equivalent degrees of effect on all types of employee groups relating to the decision to participate.

Because the majority of examinations indicated a significant inverse relationship between satisfaction with co-worker relations and tendency to quit, apparently, employees are more inclined to stay when their expectations in their relations with co-workers are considerably met. Regarding Thai public engineers who consider the high level of satisfaction with their co-workers with respect to decision to leave the public sector, this study tests,

Hypothesis 10: The higher the co-worker relations, the higher will be the job satisfaction of Thai public engineers.

Organization-Related Factors

Two organization-related factors that are related to turnover include pay and opportunity for advancement. These are discussed separately.

1) Pay

Pay consideration often appears to represent a significant factor in the turnover decision. As the level of perceived pay increases, turnover intention decreases since there appears to be a positive correlation between pay and job satisfaction; low perceived income is equated with low job satisfaction, and higher perceived incomes are equated with higher job satisfaction.

Numerous studies showed inconsistencies between pay satisfaction and turnover (Dittrich & Carrell, 1979; Hulin, 1968; Jackofsky & Peter, 1983; Koch & Rhodes, 1981;

Koch & Steers, 1978; Kraut, 1975; Mobley, et al., 1978; Waters, et al., 1976). Some studies suggested a lack of relationship between pay satisfaction and turnover (Hellriegel & White, 1973; Koch & Steers, 1978). For instance, Hellriegel and White's (1973) study examined turnover behavior of 349 certified public accountants in public accounting firms. They did not find a relationship of pay satisfaction on turnover. They noted, however, that people who left the organization had more negative attitudes toward pay than people who stayed. These people also reported significantly increases in pay on their new jobs. However, Motowidlo (1983) found that pay satisfaction was correlated with withdrawal cognition. Based upon these studies and discussed as earlier, if Thai public engineers with greater perceptions of pay are more satisfied with their organization, they will be less prone to quit their jobs. This research examines,

Hypothesis 11: The higher the perceived pay of Thai public engineers, the greater will be their organizational satisfaction.

2) Opportunity for Advancement

Another important factor which affects turnover is satisfaction with opportunity for advancement. Krau (1981) discovered that employees who were ascent oriented desire promotions, but as they could not get them, they would prefer to leave the company. Johnston, Griffeth, Burton, and Carson's (1993) study supported that non-promoted employees were more likely to leave than promoted employees because they might likely value advancement. In sum, if satisfied Thai public engineers with good opportunities of

advancement are less likely to leave than are counterparts with poorer opportunities. This study, therefore, investigates,

Hypothesis 12: The higher the opportunity for advancement perceived by Thai public engineers, the greater will be their organizational satisfaction.

This study presents a model of public sector engineers' turnover intention on the basis of the literature of turnover intention and including the specific factors that are hypothesized to directly affect turnover intention, job satisfaction and organizational satisfaction. The hypotheses derived from the proposed model in Figure 1 are tested in the next section.

III. METHOD

1. Sample

The data were obtained from a survey of 408 public sector engineers in Bangkok and other provinces, Thailand during the months of June and July 1997. For greater distribution of various engineers, subjects with university degrees were selected from sixteen different organizations of the Thai public sector.

Table 3 provides the demographics of the respondents. Descriptive statistics, namely means and standard deviations, are also shown for two purposes: (1) to develop the sample profile, and (2) to investigate the ability of the sample to represent the population of public sector engineers.

Thirty-seven percent of the participants were 36 to 45 years of age. Almost all of the engineers were males (95.8%). Sixty-two percent were married, while 35.8% were single. Fifty-one percent of the samples earned monthly salary from 10,001 to 20,000 Baht, and 30.1% earned less than 10,001 Baht.

The length of service of all respondents was almost evenly distributed over every category. Half of the engineers were civil engineers (51.5%) who comprised the main part of the Thai public service. Industrial engineers constituted 13.2% of participants, while

14.7% were other engineers. The 6-7 level* group represented 48%, while the 3-5 level group represented 42.6%.

2. Procedure

The data collection instrument was a self-administered questionnaire. Questionnaires were pre-tested using 5 engineers in the Thai public sector to determine comprehensiveness and amount of time required for completion. The revised questionnaire with a stamped, self-addressed return envelope was distributed by the Personnel Division of each organization to approximately 800 engineers. A total of 408 usable responses were returned (a 51% response rate). A cover page included information about the study and explained expected benefits for the Thai public human management. It also indicated the confidentiality of all subjects' responses.

3. Instrument Design

The existing instruments were used to measure the variables in this study. Table 4 indicates the number of items in each and Cronbach's alpha value to test internal consistency for each of the scales used in this study. The questionnaire (see Appendix A) was translated into Thai by the researcher.

* There are eleven levels in Thai public service. The higher the level, the higher the position.

3.1 Dependent Variable

Turnover intention was included in the dependent outcome variable for this study.

Turnover Intention

Turnover intention was measured with four questions from the Staying or Leaving Index (SLI) (Bluedorn, 1982). The questions (see Appendix A, questions #7-10) were measuring the plans of employees to still working for the organization within a time span of 3 months to 2 years. The instrument was in the form of a Likert 5-item scale, where 1 = Very Good, and 5 = Bad. Scores for the four questions were summed and averaged to provide a composite scale score. The higher the score stated the higher the engineers' intention to leave their jobs. The reliability for this study was .92, which is similar to that reported in various studies.

3.2 Intervening Variables

The intervening variables consisted of job satisfaction, organizational satisfaction and organizational commitment. A description of these variables is presented below.

Job Satisfaction

Overall job satisfaction was measured by the Job Descriptive Index (JDI; Smith, Kendall, and Hulin, 1969). The 16-item JDI (see Appendix A, questions #11-26) was taken from the parts of Work, Supervision and Co-Workers to measure the job satisfaction. The questions were using a 5-item Likert scale, ranging from 1 = Strongly Disagree, to 5 = Strongly Agree. The negative questions were reverse coded for data

analysis. Item scores were summed and averaged to develop the composite score. The greater the score, the greater the job satisfaction of engineers. The alpha was .86.

Organizational Satisfaction

The measurement of organizational satisfaction used in this study was based on the 11 items from 'About Your Company' developed by King (1960) asking about employees' attitudes toward their organizations. Four additional items developed by the Minnesota Satisfaction Questionnaire (MSQ; Weiss, Dawis, England & Lofquist, 1967) were included to ask about the policies regarding promotion (see Appendix A, questions #27-41). These were in the form of 5-point response scale ranging from 1 (Strongly Disagree) to 5 (Strongly Agree). A negative question (#41) was reverse coded for data analysis. Scores were summed and averaged. The higher the score, the more will be the organizational satisfaction. The internal reliability was .92.

Organizational Commitment

Continuance commitment was measured by the Continuance Commitment Scale (CCS) developed by Meyer and Allen (1984). This instrument consisted of 8 items reflecting cost related to quitting the organization, both in terms of personal loss or sacrifice and lack of comparable alternatives (see Appendix A, questions #42-49). Subjects responded on a 5-point scale from 1 (Strongly Disagree) to 5 (Strongly Agree). Two questions (#42, & 45) were reverse coded for data analysis. The higher the score, the higher the organizational commitment of Thai public engineers. The alpha for this study was .71.

3.3 Independent Variables

The independent variables comprised external employment opportunity, job security, pension, personal factor, job-related factors and organization-related factors. Each is identified and explained below.

External Employment Opportunity

A single item developed from Arnold and Feldman (1982) was made up the assessment of employment opportunity: employing, “All things considered, what do you feel are your chances of finding a suitable position in the private sector?” (see Appendix A, question #101). Possible responses were ranged from 1 = highly unlikely, not very good, fairly good, highly likely = 4. Scores were summed and averaged for this question. The higher scores indicated the higher perception of external employment opportunities. The distribution of actual respondents indicated the entire 1-4 range, with a mean of 2.38 and a standard deviation of .95.

Job Security

To measure perceived job security, this study used a single item (see Appendix A, question #102) to ask respondents, “How important to your decision to remain with the organization is a stable job without being fired?” This item was used in the form of a 5-point scale, ranging from Very Unimportant = 1, to Very Important = 5. The frequencies of different respondents covered all 1-5 range, with a mean of 3.69 and a standard deviation of 1.29.

Pension

This study assessed the importance of the pension by the extent to which the respondent indicated unimportant or important on a 5-point response scale stating, “How important to your decision to remain with the organization is your pension?” (see Appendix A, question #103). The distribution of actual scores covered the entire 1-5 range, with a mean of 2.89 and a standard deviation of 1.36.

Personal Factors

Personal data were obtained by asking respondents to provide their age, gender, length of time in their current organization (tenure), marital status and title. In addition, self-efficacy expectation was included in the personal factors.

Self-Efficacy Expectation

The general self-efficacy scale developed by Jones (1986), was used for measuring work self-efficacy. The instrument consisted of 8-item questions which asked respondents’ about expectations of attribution of success to skill in their performance (see Appendix A, questions #92-99). The respondents indicated the degree of agreement or disagreement with a given statement, using a 5-point scale, where 1 = Strongly Disagree, and 5 = Strongly Agree. The scores were summed and averaged. A greater score indicated a greater perception of self-efficacy expectations. Internal consistency reliability in this study was found to be .67.

Job-Related Factors

The job-related factors were composed of job characteristics, leader consideration and co-worker relation. Each of these factors is separately explored.

Job Characteristics

The measure of perceived job characteristics conducted in this research was based on the 13-item Job Diagnostic Survey developed by Hackman and Oldham (JDS; 1975) (see Appendix A, questions #50-62). Respondents rated accuracy or inaccuracy of characteristics of their jobs on a 5-point response scale from 1 (Very Inaccurate) to 5 (Very Accurate). The negative questions were reverse coded for data analysis (#52, 54-56, 58, 60-62). Item scores were summed and averaged to provide the composite score. The alpha was .72.

Leader Consideration

The Leader Behavior Description Questionnaire Form XII (LBDQ; Stogdill, 1963) was chosen as a guide in developing a measure of leader relation. The eight questions (#65-72) were taken from the Consideration, LBDQ (see Appendix A), while two additional questions (#73-74) were taken from Lincoln and Kalleberg (1990) to provide an instrument concerning the superior-subordinate relationships (see Appendix A). Each of these items was in the form of a 5-point scale, where 1 = Strongly Disagree, and 5 = Strongly Agree. The negative questions (#71-72) were reverse coded for data analysis. All scores were summed and averaged. The internal reliability of this scale was .89.

Co-Worker Relation

Co-worker relation was measured by a 4-item scale (Lincoln & Kalleberg, 1990); see Appendix A, questions #79-82). The reliability of the co-worker relation scale in the present sample was .66.

Organization-Related Factors

The organization-related factors contained pay satisfaction and opportunity for advancement. These are discussed below.

Pay Satisfaction

Job Descriptive Index (JDI) developed by Smith, Kendall, and Hulin (1969) were used in measuring the employees' perceived pay (see Appendix A, questions #83-88). Respondents answered on a 5-point scale ranging from 1 = Strongly Disagree to 5 = Strongly Agree. Three questions (#83, 85-86) were reverse coded for data analysis. The higher the score, the higher perception of pay satisfaction. Internal reliability in this study was .79.

Opportunity for Advancement

The degree to which the individuals indicated agreement or disagreement regarding opportunity for advancement was also assessed by 4-items from the JDI (see Appendix A, questions #89-92). These were in the form of 5-point scales, where 1 = Strongly Disagree, and 5 = Strongly Agree. Higher scores indicated a higher perception of opportunity for advancement. The coefficient alpha of this scale was .85.

4. Data Analysis

The data analysis proceeded in two steps: Pearson correlations and path analysis. The Pearson correlations indicated the strength of relationship among the variables of interest in this study. The path analysis (Asher, 1983) was conducted to analyze the proposed model through a series of multiple regressions in the Statistical Package for the Social Sciences (SPSS). It was the technique of causal model analysis used for the study of previous models of job satisfaction, organizational commitment and turnover (Bluedorn, 1982; Curry, et al., 1985; Dougherty & Bluedorn, 1985; Lachman & Aranya, 1986; Michaels & Spector, 1982; Price & Mueller, 1981; Quarles, 1994). This statistical technique was used to evaluate the causal relationship among work attitudes and some of their determinants and consequences, and presented both significant direct and indirect effects of independent variables on a dependent variable in the model. It was of interest to explain the explicit and implicit linkages among the variables of interest, particularly which specific variables strongly influenced turnover intentions of public sector engineers.

Table 3
Demographics of Thai Public Engineer Participants

Demographics	Number of Respondents	Percent	Mean	S.D.	Ranges
Age:	408	100.0	2.73	.92	1-5
1. Under 26 years	34	8.3			
2. 26-35 years	135	33.1			
3. 36-45 years	151	37.0			
4. 46-55 years	84	20.6			
5. Over 55 years	4	1.0			
Gender:	408	100.0	1.96	.20	1-2
1. Female	17	4.2			
2. Male	391	95.8			
Marital Status:	408	100.0	1.66	.52	1-3
1. Single	146	35.8			
2. Married	253	62.0			
3. Widowed/Divorced	9	2.2			
Monthly Salary:	408	100.0	1.92	.76	1-4
1. Under 10,001 baht	123	30.1			
2. 10,001-20,000 baht	208	51.0			
3. 20,001-30,000 baht	64	15.7			
4. Over 30,000 baht	13	3.2			
Length of Service:	408	100.0	2.97	1.41	1-5
1. Under 6 years	82	20.1			
2. 6-10 years	86	21.1			
3. 11-15 years	77	18.9			
4. 16-20 years	87	21.3			
5. Over 20 years	76	18.6			
Title:	408	100.0	3.34	1.95	1-7
1. Mechanical Engineer	23	5.6			
2. Civil Engineer	210	51.5			
3. Electric & Communication Engineer	23	5.6			
4. Industrial Engineer*	54	13.2			
5. Irrigation Engineer	14	3.4			
6. Nuclear Engineer	24	5.9			
7. Other Engineer	60	14.7			
Level:**	408	100.0	1.67	.64	1-3
1. Level 3-5	174	42.6			
2. Level 6-7	196	48.0			
3. Level 8 and over	38	9.3			

* Includes both Factory Inspection Engineer and Industrial Academic.

** There are eleven levels in Thai public positions. The higher the level, the higher the position.

Table 4
Variable Measures, Number of Items and Cronbach's Alpha

Variable Measured	Number of Items	Alpha Reliability*
1. Turnover Intention	4	.92
2. Job Satisfaction	16	.86
3. Organizational Satisfaction	15	.92
4. Organizational Commitment	8	.71
5. Self-Efficacy Expectation	8	.67
6. Job Characteristics	13	.72
7. Leader Consideration	10	.89
8. Co-Worker Relation	4	.66
9. Pay Satisfaction	6	.79
10. Opportunity for Advancement	4	.85

* $p = .000$

IV. RESULTS

1. Test of Hypotheses

The means, standard deviations, minimum and maximum scores for all variables are presented in Table 5. Intercorrelations among all the variables of interest in this study appear in Table 6.

The variables having the strongest negative relationship to turnover intention are organizational satisfaction ($r = -.24$), job satisfaction ($r = -.23$) and organizational commitment ($r = -.19$). Perception of job security is also significantly correlated with turnover intention, although to a smaller degree ($r = -.11$). External employment opportunity and pension are not correlated with turnover intention.

All four variables are significantly positively correlated with job satisfaction. These are perception of job characteristics ($r = .54$), leader consideration ($r = .52$), co-worker relation ($r = .50$) and self-efficacy expectation ($r = .20$). In addition, organizational satisfaction is significantly positively correlated with job satisfaction ($r = .67$). Organizational commitment, however, is not correlated with job satisfaction.

Pay Satisfaction ($r = .31$) and opportunity for advancement ($r = .69$) are significantly positively correlated with organizational satisfaction. Organizational commitment is not found to be correlated with organizational satisfaction.

The results for individual hypotheses are shown as follows:

Hypothesis 1 stated that the higher the job satisfaction of Thai public engineers, the lower will be their turnover intention. Results of correlation ($r = -.23, p \leq .001$) support this hypothesis.

Hypothesis 2 stated that the higher the organizational satisfaction of Thai public engineers, the lower will be their turnover intention. Results of correlation ($r = -.24, p \leq .001$) support this hypothesis.

Hypothesis 3 stated that the higher the organizational commitment of Thai public engineers, the lower will be their turnover intention. Results of correlation ($r = -.19, p \leq .001$) support this hypothesis.

Hypothesis 4 stated that the greater the number of perceived external employment opportunity, the greater will be the turnover intention of Thai public engineers. Results of correlation ($r = .08, n.s.$) do not support this hypothesis.

Hypothesis 5 stated that the greater the perception of job security, the lower will be the turnover intention of Thai public engineers. Results of correlation ($r = -.11, p \leq .05$) support this hypothesis.

Hypothesis 6 stated that the greater the perceived pension of Thai public engineers, the lower will be their turnover intention. Results of correlation ($r = -.08$, n.s.) do not support this hypothesis.

Hypothesis 7 stated that the higher the self-efficacy expectation, the higher will be the job satisfaction of Thai public engineers. Results of correlation ($r = .20$, $p \leq .001$) support this hypothesis.

Hypothesis 8 stated that the higher the perceived characteristics about the job, the higher will be the job satisfaction of Thai public engineers. Results of correlation ($r = .54$, $p \leq .001$) support this hypothesis.

Hypothesis 9 stated that the higher the perception of leader consideration of Thai public engineers, the higher will be their job satisfaction. Results of correlation ($r = .52$, $p \leq .001$) support this hypothesis.

Hypothesis 10 stated that the higher the co-worker relations, the higher will be the job satisfaction of Thai public engineers. Results of correlation ($r = .50$, $p \leq .001$) support this hypothesis.

Hypothesis 11 stated that the higher the perceived pay of Thai public engineers, the greater will be their organizational satisfaction. Results of correlation ($r = .31$, $p \leq .001$) support this hypothesis.

Hypothesis 12 stated that the higher the opportunity for advancement perceived by Thai public engineers, the greater will be their organizational satisfaction. Results of correlation ($r = .69, p \leq .001$) support this hypothesis.

2. Test of Model

2.1 Proposed Model

Further analysis is conducted to investigate the relationship between various variables, and also to discover which variables have the most impact upon employees' leaving. Path analysis is used to examine the overall model concerning causal priority of the variables in Figure 1 which are summarized in Tables 7-10. This analysis not only permits testing of hypothesized relationships, but also provides an indication of any unhypothesized direct relationships that are present in the data. The statistically significant standardized beta weights, which represent the path coefficients, are the respective zero-order correlations and show the relative strength of associations with all variables as the direct effects of the independent variables on the dependent variables in the analysis. Path coefficients found to be statistically insignificant ($p > .05$) were assumed to indicate no direct influence, and therefore were deleted (Asher, 1983). Table 7 shows the results of the direct relationships of all variables related to turnover intention. The direct relationships of each variable that is hypothesized to turnover intention are presented in Table 8. Table 9 indicates the direct relationships between job satisfaction and the job-related factors, including organizational satisfaction, whereas the direct

effects of the organizational satisfaction on organizational satisfaction appear in Table 10. In addition, Figure 2 presents a graphical representation of the results of the path analysis process and the model derived from that process.

The initial regression involves turnover intention as the dependent variable with all other model variables used as independent variables. Table 7 presents that the overall $F = 3.885$; $p = .000$. Organizational commitment is directly inversely related to turnover intention ($\beta = -.167$, $t = -3.122$, $p = .002$), and explains 11% of the variance in the turnover intention.

The findings suggest that while turnover intention among Thai public engineers is unrelated to job satisfaction and organizational satisfaction, it is modestly affected by organizational commitment ($\beta = -.167$). The absence of significant direct paths from those variables, namely both job and organizational satisfaction and job security to the turnover intention suggests that the zero-order relation between them (-.23, -.24 and -.11 respectively) is modestly spurious: when the effect of organizational commitment is controlled, the direct effects of such variables on turnover intention turn out to be significant.

The second regression, turnover intention is regressed with only job satisfaction, organizational satisfaction, organizational commitment, external employment opportunity, job security and pension that are hypothesized to directly affect the turnover intention. Table 8 shows that job satisfaction, organizational satisfaction, and

organizational commitment are significant and account for 10% of the variance with an overall $F = 7.468$; $p = .000$. The individual variables have standardized beta coefficients: organizational commitment ($\beta = -.169$, $t = -3.207$, $p = .001$), organizational satisfaction ($\beta = -.139$, $t = -2.158$, $p = .032$) and job satisfaction ($\beta = -.136$, $t = -2.123$, $p = .034$).

The next regression is the use of job satisfaction as the dependent variable, and the use of self-efficacy expectation, perceived job characteristics, leader consideration and co-worker relation, including organizational satisfaction and organizational commitment, as the independent variables. The results report in Table 9 that the overall $F = 105.942$; $p = .000$. Job characteristics ($\beta = .296$, $t = 8.588$, $p = .000$); leader consideration ($\beta = .202$, $t = 5.628$, $p = .000$); co-worker relation ($\beta = .161$, $t = 4.416$, $p = .000$); and organizational satisfaction ($\beta = .382$, $t = 9.507$, $p = .000$) are directly positively related to job satisfaction. Together these four variables explain 61% of the variance in the job satisfaction.

The final regression in the series involves the use of organizational satisfaction as the dependent variable, and the use of pay satisfaction and opportunity for advancement, including job satisfaction and organizational commitment as the independent variables. Table 10 indicates that the set of organization-related variables including job satisfaction are directly positively related to organizational satisfaction ($F = 141.805$; $p = .000$). The following individual variables have significant weights: pay satisfaction ($\beta = .091$, $t = 2.638$, $p = .009$), opportunity for advancement ($\beta = .425$, $t = 10.110$, $p = .000$) and job

satisfaction ($\beta = .387, t = 9.465, p = .000$). Together these variables explain 58% of the variance in organizational satisfaction.

2.2 Modified Model

Figure 2 shows that neither external employment opportunity, perceived job security, nor pension have a significant direct relationship with turnover intention, when turnover intention is regressed with all model variables that are both hypothesized and unhypothesized. However, perceived job security is found to be related to both organizational satisfaction and organizational commitment, it may be a better predictor of organizational commitment than that of organizational satisfaction because of its stronger relationship with organizational commitment than with organizational satisfaction. In addition, external employment opportunity and pension may be significant predictors of organizational commitment since their correlations with the organizational commitment. Therefore, a further analysis is conducted to test this relationship.

When organizational commitment is regressed against all of perceived job security, pension and external employment opportunity, and they account for 19% of the variance with an overall $F = 31.733; p = .000$ (Table 11). Each of these variables has a direct relationship with organizational commitment as follows: perceived job security ($\beta = .100, t = 1.973, p = .049$), pension ($\beta = .267, t = 5.212, p = .000$) and external employment opportunity ($\beta = -.217, t = -4.660, p = .000$).

The modified model with path coefficients is provided in Figure 3. The final model treats turnover intention as a function of job satisfaction, organizational satisfaction and organizational commitment. It treats organizational commitment as a function of external employment opportunity, pension and perceived job security.

It is also of interest of this study to present an indirect effect of each of variables in the modified model of public sector engineer. The reason is that the indirect effect emphasizes the fact that a variable may influence an outcome such as turnover intention, although there is no direct relationship between that variable and the outcome. Indirect effects are calculated by multiplying sequences of direct effects from left to right across the modified model, for example, the indirect effect of job satisfaction on turnover intention is $(+.387) \times (-.139) = -.054$. The total effect expresses the combination of the direct and indirect effects for each variable, for example, the total effect of job satisfaction on turnover intention is $(-.136) + (+.387 \times -.139) = -.190$.

As can be seen in Table 12, both job and organizational satisfaction exhibit the maximum total effects on turnover intention, though organizational commitment shows the higher direct effect than do both. Organizational satisfaction shows the strongest direct (total) effect on job satisfaction, with job characteristics, leader consideration and co-worker relation showing lower but significant direct (total) effects. The maximum direct (total) effect for organizational satisfaction is opportunity for advancement, with job satisfaction and pay satisfaction showing relative lower but significant direct (total) effects. Finally, pension shows the maximum direct (total) effect on organizational

commitment, with external employment opportunity and perceived job security showing lower but significant direct (total) effects.

Table 5
Means, Standard Deviations, Minimum and Maximum Scores

Variable Measured	Means	S. D.	Min.	Max.
1. Turnover Intention	1.58	.93	1.00	5.00
2. External Employment Opportunity	2.38	.95	1.00	4.00
3. Job Security	3.69	1.29	1.00	5.00
4. Pension	2.89	1.36	1.00	5.00
5. Job Satisfaction	3.69	.52	2.00	5.00
6. Organizational Satisfaction	3.20	.68	1.20	4.87
7. Organizational Commitment	2.90	.65	1.25	4.88
8. Self-Efficacy Expectation	3.60	.44	1.75	5.00
9. Job Characteristics	3.58	.45	2.31	4.69
10. Leader Consideration	3.44	.67	1.30	5.00
11. Co-Worker Relation	3.70	.54	1.25	5.00
12. Pay Satisfaction	2.44	.70	1.00	4.17
13. Opportunity for Advancement	3.30	.84	1.00	5.00

Table 6
Pearson Intercorrelations between Variables

Variables	1	2	3	4	5	6	7	8	9	10	11	12
1. Turnover Intention												
2. External Employment Opportunity	.08											
3. Job Security	-.11*	-.21***										
4. Pension	-.08	-.24***	.46***									
5. Job Satisfaction	-.23***	.09*	.13**	.06								
6. Organizational Satisfaction	-.24***	.03	.17***	.13**	.67***							
7. Organizational Commitment	-.19***	-.30***	.27***	.37***	.02	.06						
8. Self-Efficacy Expectation	-.06	.16***	-.04	.02	.20***	.12*	-.07					
9. Job Characteristics	-.12*	.19***	.09*	-.00	.54***	.35***	-.10*	.18***				
10. Leader Consideration	-.10*	.07	.03	.06	.52***	.48***	-.02	.08*	.29***			
11. Co-Worker Relation	-.17***	.05	.20***	.03	.50***	.49***	.06	.21***	.29***	.25***		
12. Pay Satisfaction	-.13**	-.15***	.15**	.21***	.22***	.31***	.18***	-.02	.01	.17***	.19***	
13. Opportunity for Advancement	-.20***	.08	.10*	.06	.62***	.69***	.03	.12*	.28***	.40***	.41***	.31***

*** $p \leq .001$

** $p \leq .005$

* $p \leq .05$

Table 7
Direct Relationships of Factors on Turnover Intention

<u>Model</u> <u>r^2</u>	<u>Overall F</u>	<u>Independent</u> <u>Variable</u>	<u>Beta</u>	<u>t</u>	<u>p</u>
.11	3.885*	External Employment Opportunity	+.052	+.987	.324
		Perceived Job Security	-.021	-.370	.712
		Pension	+.037	+.641	.522
		Job Satisfaction	-.114	-1.431	.153
		Organizational Satisfaction	-.124	-1.615	.107
		Organizational Commitment	-.167	-3.122	.002
		Self-Efficacy Expectation	-.030	-.606	.545
		Job Characteristics	-.035	-.597	.551
		Leader Consideration	+.048	+.840	.401
		Co-Worker Relation	-.019	-.332	.740
		Pay Satisfaction	-.034	-.642	.521
		Opportunity for Advancement	-.027	-.384	.701

* $p = .000$

Table 8
Direct Relationships of Hypothesized Factors on Turnover Intention

Model r^2	Overall F	Independent Variable	Beta	t	p
.10	7.468*	External Employment Opportunity	+.046	+.897	.370
		Perceived Job Security	-.028	-.514	.608
		Pension	+.036	+.641	.522
		Job Satisfaction	-.136	-2.123	.034
		Organizational Satisfaction	-.139	-2.158	.032
		Organizational Commitment	-.169	-3.207	.001

* $p = .000$

Table 9
Direct Relationships of Factors on Job Satisfaction

Model r^2	Overall F	Independent Variable	Beta	t	p
.61	105.942*	Self-Efficacy Expectation	+.054	+1.683	.093
		Job Characteristics	+.296	+8.588	.000
		Leader Consideration	+.202	+5.628	.000
		Co-Worker Relation	+.161	+4.416	.000
		Organizational Satisfaction	+.382	+9.507	.000
		Organizational Commitment	+.027	+.860	.390

* $p = .000$

Table 10
Direct Relationships of Factors on Organizational Satisfaction

Model r^2	Overall F	Independent Variable	Beta	t	p
.58	141.805*	Pay Satisfaction	+.091	+2.638	.009
		Opportunity for Advancement	+.425	+10.110	.000
		Job Satisfaction	+.387	+9.465	.000
		Organizational Commitment	+.025	+.775	.439

* $p = .000$

Figure 2
Derived Model of PS Engineers Turnover Intention

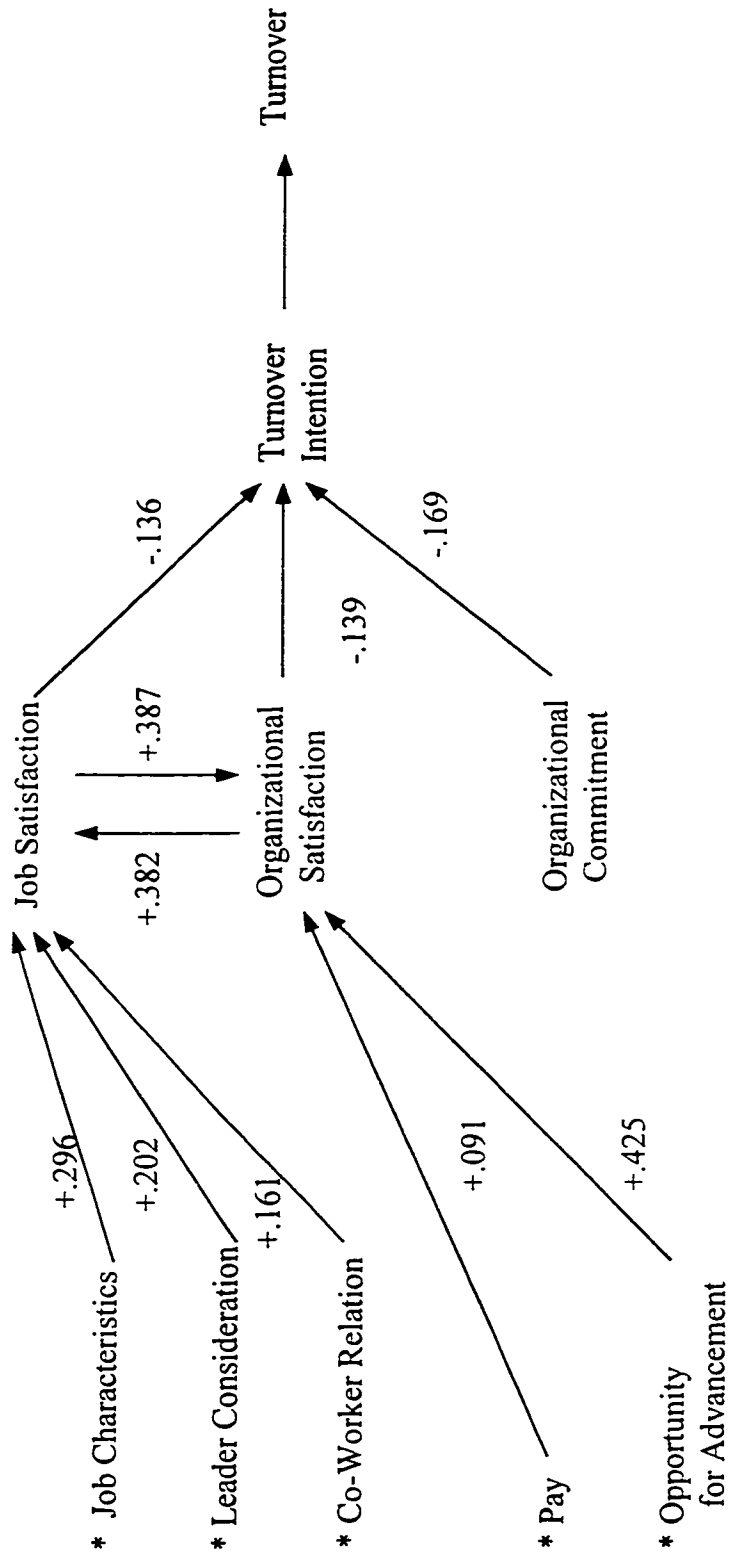


Table 11
Direct Relationships of Factors on Organizational Commitment of Modified Model

Model r^2	Overall F	Independent Variable	Beta	t	p
.19	31.733*	External Employment Opportunity	-.217	-4.660	.000
		Perceived Job Security	+.100	+1.973	.049
		Pension	+.267	+5.212	.000

* $p = .000$

Figure 3
Modified Model of PS Engineers Turnover Intention with Path Coefficients

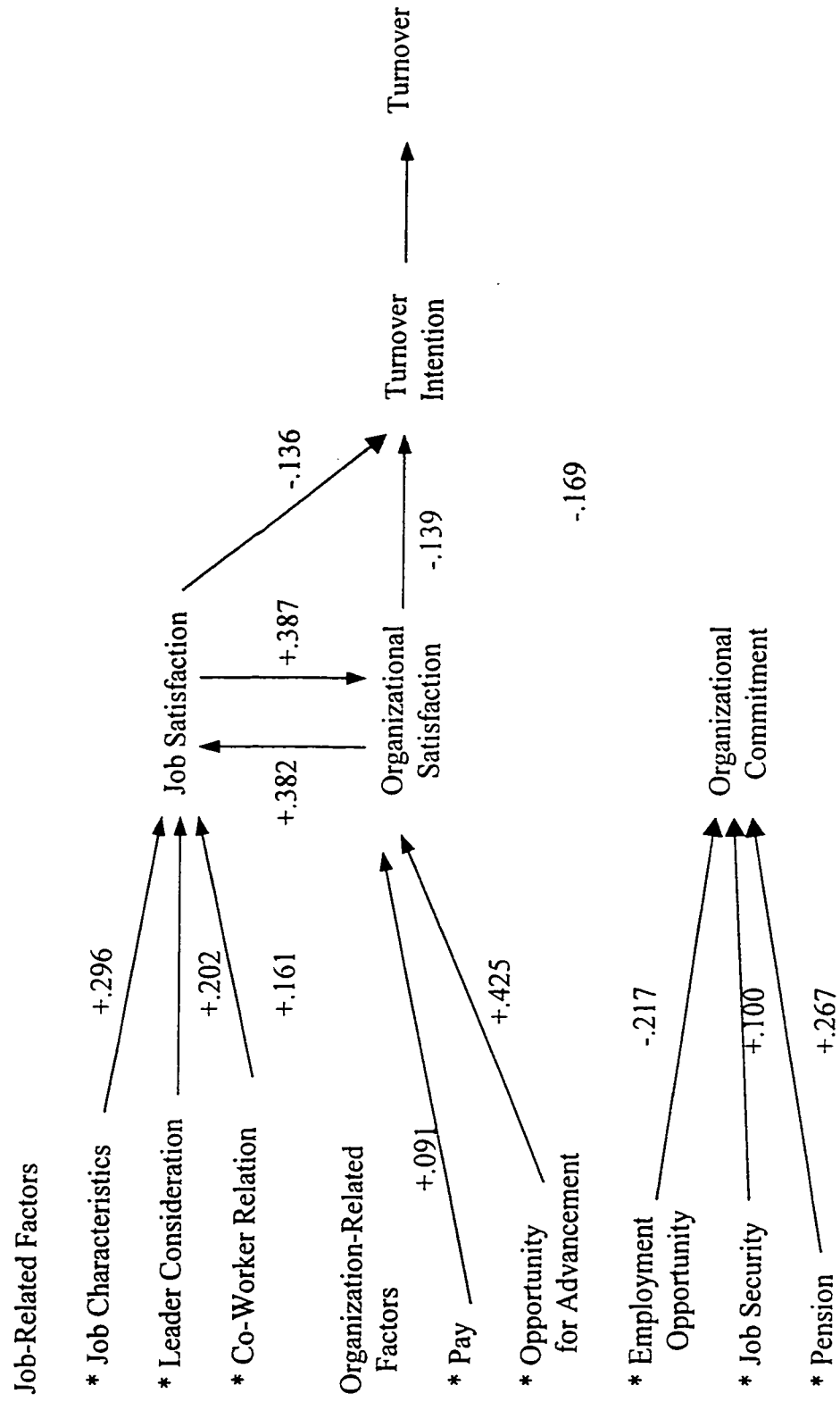


Table 12
Direct, Indirect and Total Effects of Significant Independent Variables
on Dependent Variables

Dependent Variable	Independent Variable	Simple <i>r</i>	Direct Effect <i>(β)</i>	Indirect Effect <i>(IE)</i>	Total Effect <i>(TE)</i>
Turnover Intention (<i>r</i> ² = .10)	Job Satisfaction	-.23 ^{***}	-.136 [*]	-.054	-.190
	Organizational Satisfaction	-.24 ^{***}	-.139 [*]	-.052	-.191
	Organizational Commitment	-.19 ^{***}	-.169 ^{***}	na	-.169
	Job Characteristics	-.12 [*]	na	-.056	-.056
	Leader Consideration	-.10 [*]	na	-.038	-.038
	Co-Worker Relation	-.17 ^{***}	na	-.031	-.031
	Pay Satisfaction	-.13 ^{**}	na	-.017	-.017
	Opportunity for Advancement	-.20 ^{***}	na	-.081	-.081
	External Employment Opportunity	+.08	na	+.037	+.037
	Perceived Job Security	-.11 [*]	na	-.017	-.017
Pension	-.08	na	-.045	-.045	
Job Satisfaction (<i>r</i> ² = .61)	Job Characteristics	+.54 ^{***}	+.296 ^{***}	na	+.296
	Leader Consideration	+.52 ^{***}	+.202 ^{***}	na	+.202
	Co-Worker Relation	+.50 ^{***}	+.161 ^{***}	na	+.161
	Organizational Satisfaction	+.67 ^{***}	+.382 ^{***}	na	+.382
	Pay Satisfaction	+.22 ^{***}	na	+.035	+.035
Opportunity for Advancement	+.62 ^{***}	na	+.162	+.162	

*** *p* ≤ .001

** *p* ≤ .005

* *p* ≤ .05

Table 12 (continued)

Dependent Variable	Independent Variable	Simple <i>r</i>	Direct Effect <i>(β)</i>	Indirect Effect <i>(IE)</i>	Total Effect <i>(TE)</i>
Organizational Satisfaction ($r^2 = .58$)	Pay Satisfaction	+0.31 ^{***}	+0.091 [*]	na	+0.091
	Opportunity for Advancement	+0.69 ^{***}	+0.425 ^{***}	na	+0.425
	Job Satisfaction	+0.67 ^{***}	+0.387 ^{***}	na	+0.387
	Job Characteristics	+0.35 ^{***}	na	+0.115	+0.115
	Leader Consideration	+0.48 ^{***}	na	+0.078	+0.078
	Co-Worker Relation	+0.49 ^{***}	na	+0.062	+0.062
Organizational Commitment ($r^2 = .19$)	External Employment	-0.30 ^{***}	-0.217 ^{***}	na	-0.217
	Opportunity				
	Perceived Job Security	+0.27 ^{***}	+0.100 [*]	na	+0.100
	Pension	+0.37 ^{***}	+0.267 ^{***}	na	+0.267

*** $p \leq .001$

** $p \leq .005$

* $p \leq .05$

V. DISCUSSION

Overall results are supportive of the model, although they suggest some modifications. Support is found that job-related factors and organization-related factors plus perceived job security, pension and external employment opportunity, lead to job satisfaction, organizational satisfaction and organizational commitment, which in turn lead to turnover intention, which lead to turnover.

More specifically, turnover intention is directly inversely affected by organizational commitment, organizational satisfaction and job satisfaction, with those three variables explaining a modest amount of the variance in those intention. This suggests that engineers who are committed to the Thai public service, and who are satisfied with their jobs and organizations, will be less likely to find another job in other organizations, especially in the private sector.

The foregoing results from this study present that organizational commitment has a greater direct effect on turnover intention than does job satisfaction, although it has a weaker total effect. This is consistent with prior research (e.g. Peters, et al., 1981, Shore & Martin, 1987; Williams & Hazer, 1986) that organizational commitment is a better predictor of turnover intention than is job satisfaction. This may explain that Thai public engineers consider the high sunk cost concerning pension and alternatives as the most considerable factor in their decisions to remain with the public sector.

Additional result is shown that no causal relationship exists between organizational commitment and job satisfaction. This finding is similar to findings in other work that examined the causal order of organizational commitment and job satisfaction (e.g. Bateman & Strasser, 1984; Curry, et al., 1986). Thus, both job satisfaction and organizational commitment will independently and uniquely influence whether engineers decide to stay or quit their positions in the Thai public sector.

In regard to the relationship between job and organizational satisfaction, one point is that the magnitude and significance of the relationship between job satisfaction and turnover intention, is surprising, as it is almost equal to the causal link between organizational satisfaction and turnover intention. This is inconsistent with the study of Shore, et al. (1990) showing that organizational attitudes are more strongly related to turnover intention. The finding suggests that both job and organizational satisfaction are equally important predictors of turnover intention of Thai public sector engineers.

Another point is that both job and organizational satisfaction contribute directly to each other. It may be the strong relationship between job satisfaction and organizational satisfaction, which is exhibited by the high correlation between two attitudes. Another possibility is that since a job exists within an organizational context, attitudes towards either the job or organization will be related (Shore, et al., 1990). In addition, organizational satisfaction is found to have the greatest direct effect on job satisfaction, whereas job satisfaction is not. This may explain that Thai public engineers emphasize more to general employment policies and practices, namely pay and opportunity for

advancement, and hence influence to job factors, namely job characteristics, leader consideration and co-worker relation. However, these findings may be that job satisfaction and organizational satisfaction are not distinct enough constructs to be treated independently. Thus, more research comparing the similarities and differences of these constructs needs to be conducted.

Self-efficacy expectation is not be found as a significant moderator in the turnover process. Although significant correlation of self-efficacy expectation with job satisfaction, self-efficacy expectation makes no significant contribution to the model in the present study. That is, self-efficacy expectation has no significant direct effect on job satisfaction. In other words, job satisfaction does not result when employees perceive self-efficacy to be high. According to theory of planned behavior (Ajzen, 1988), perceived behavioral control influences a certain behavior and is found to correlate well with the tendency to perform behavior attaining goal. This finding is probably due to self-efficacy as perceived behavioral control directly link to planned behavior and action, such as goal setting and performance. Good performance results from the person's control to exert the ability on expected performance for goal attainment. However, the direct relationship between self-efficacy and affective response is still interesting, and thus more research is needed to obviously examine the possible causal of these variables.

As shown by Table 12 and Figure 3, the job characteristics is the most second important determinant of job satisfaction. Both job characteristics and job satisfaction act directly and positively, which in turn both directly and indirectly decreases turnover

intention. This is in agreement with previous research (e.g. Jackofsky & Peters, 1983; Koch & Rhodes, 1981; Michaels & Spector, 1982; Mobley, et al., 1978) showing causal relationship between perceived job characteristics and job satisfaction. Perhaps skill variety from job surfaces as the most significant variable for engineers who possess a lot of skills and knowledge. It may be of interest to further discuss which aspects of job characteristics are significant in predicting work satisfaction in order to improve public sector engineer's work.

Leader consideration, the most third important determinant, is directly related to total job satisfaction, and also directly and indirectly affects turnover intention. This result is in conformance with Michaels and Spector's (1982) study which found that leader consideration relates to job satisfaction, which in turn leads to turnover intention. Satisfied Thai public sector engineers perceive their leaders who are high on human relation ability, and thus remain with their organization. The Office of the Civil Service Commission's (1996) study showed the result for support this finding that the importance of supervision was one of the most significant factors affecting turnover of Thai public employees.

The last finding of determinants of job satisfaction is that co-worker relation has a direct positive effect on job satisfaction, which in turn has both direct and indirect inverse effects on turnover. This result provides support for Koch and Steers' (1978) study that individuals who are more satisfied with their co-workers, will be less prone to leave their jobs. Moreover, it is consistent with Emmert and Taher's (1992) study that satisfaction

with social relations including from colleagues has impact on work satisfaction of public sector professionals.

Pay satisfaction has a very small, but meaningful effect. It directly influences organizational satisfaction, which in turn directly and indirectly influences turnover intention. This finding is pertinent to Motowidlo's (1983) study, which found that pay satisfaction exerts effects on turnover intention. However, the small correlation of pay satisfaction with turnover intention indicates that Thai public engineers do not consider income as the most important factor regarding the decisions to leave the public sector. This is supported by prior studies (e.g. Rainey, et al., 1976) that monetary incentives are less emphasized than nonmonetary aspects (e.g. job security) among public sector employees. Another point is that public employees were aware of the relative low income when they first entered the public sector. In addition, the pay structure of the public sector is organized according to different levels of position. All employees at a specific level receive the same salary. Therefore, the level of salary is not always a significant determinant affecting their dissatisfaction. Employees may be dissatisfied because they perceive inequity of the performance-pay link.

Opportunity for advancement increases organizational satisfaction and this in turn increases job satisfaction, and reduces turnover intention acting through those two intervening variables. This finding provides support for Johnston, et. al.'s (1993) study that employees who perceive more promoted are more likely to stay in their jobs than those perceive non-promoted. Interestingly, the mostly high correlation and direct effect

of opportunity for advancement on organizational satisfaction indicate that this construct is the most important predictor of organizational satisfaction among Thai public engineers. Thai public engineers with the high perception of higher position, are more satisfied with the public sector than those with the low perception.

One of the most interesting findings is that external employment opportunity is found to be directly related to organizational commitment, but is not significant with turnover intention. This is congruent with Quarles' (1994) study showing causality between these two variables. Inconsistent with both studies (Gerhart, 1990; Mobley, et al., 1979), external employment opportunity was found to be directly related to turnover intention, however, Gerhart's (1990) study indicated that external employment opportunity was a moderator of the relationship between job satisfaction and turnover intention, rather than as a direct precursor of turnover intention. This may be because the present study uses continuance commitment constructs (Meyer & Allen, 1984) involving the idea of alternative job opportunities. Nevertheless, this study uses only a single item, it will seem worthwhile for future research to investigate this variable more thoroughly.

Another finding is that perceived job security does not show a direct influence on turnover intention, but has a direct effect on organizational commitment. Different with Arnold and Feldman's (1982) study, perceived job security was found to be directly related to turnover. Perhaps this is because of the stronger correlation of perceived job security with organizational commitment than of that with turnover intention. This finding indicates that engineers do not consider job security as a major direct influence on

their desire to leave the Thai public sector. They just perceive job security as opportunity cost that they trade off for higher income in the private sector. If the private sector offers the higher salary than their opportunity cost of remaining with their positions, they will leave. More research is needed to clarify the causal relationships between these variables.

The results also indicate that pension does not directly influence turnover intention, but has the maximum direct effect on organizational commitment, which in turn indirectly affects turnover intention. This will explain that Thai public sector engineers perceive pension as the most substantial predictor of total commitment to their organizations. This is contrary to the study of Lurie (1965) which showed that there is the little or no effect of pension on turnover. One explanation is that pension is a predicted antecedent of continuance commitment measured in this study (Allen & Meyer, 1990). This finding indicates that Thai public sector engineers with high perception of pension are more likely to commit to their organizations than those with low perception of pension. With perceived high cost regarding pension, they need to remain with the Thai public sector.

With regard to the findings in this study, the final model modified from the original model is more practical in its pertinence to Thai public engineers. The final model indicates that organizational commitment has the maximum effect on turnover intention. However, job satisfaction is still the important variable in the turnover process. Organizational satisfaction is found to be one of the significant factors in the turnover

decision. These findings have implications for both theory and practice, and for future studies which are stated in the next section.

VI. CONCLUSION

This study is an attempt to identify the causal linkages between attitudinal antecedents of turnover intention, and to investigate more specifically which variables affect turnover intention in the public sector at the individual level of analysis in different cultural settings. The foregoing results indicate that job satisfaction and organizational commitment each independently produce turnover intention, whereas both job satisfaction and organizational satisfaction are reciprocally related, and lead to turnover intention. Organizational commitment is more powerful predictors of turnover intention than are both job and organizational satisfaction. Organization-related attitudes are also found to have the most direct effect on job satisfaction. The results of this study are summarized and discussed in the previous section. Hence, this section will conclude with two issues regarding implications for theory and practice, and for future studies.

1. Implications for Theory and Practice

This study has implications for both theory and practice on the determinants of turnover through turnover intention and in different cultural settings.

On a theoretical level, the present results provide more information about various variables in the withdrawal process. The findings partially confirm that job and organizational attitudes relate differently to turnover intention in the case of the job satisfaction-turnover intention relationship and organizational commitment-turnover

intention relationship. As both organizational commitment and job satisfaction are given attention in the literature as important determinants and as intervening variables, organizational commitment is found to be the best predictor of turnover intention, in terms of the maximum direct effect. However, job satisfaction is still the significant predictor of turnover intention and serve as an important mediating variable between the other determinants and turnover intention- thus its maximum total effect, in this study. One of organizational attitudes is organizational satisfaction that is found to be a significant factor in the turnover intention and the most significant determinant of job satisfaction. The data examined in this study suggest a model indicating that these attitudinal variables are affected by job-related factors (e.g. job characteristics, leader consideration and co-worker relation), organization-related factors (e.g. pay satisfaction and opportunity for advancement), perceived job security, pension and external employment opportunity.

In terms of cross-cultural issues, the results obviously provide for the benefits of a western theoretical framework for public sector engineers' research and practice in a developing country, such as Thailand. The study also includes importance in the cross-cultural literature by developing the application of a western theoretical model to an eastern country context.

From a practitioner's viewpoint, the results contribute to an understanding of turnover intention of Thai public sector engineers. The Thai public sector faced with an unacceptable rate of engineers turnover may be able to favorably affect that rate by

increasing the levels of commitment and satisfaction of its public sector engineers. However, the problem is that organizational commitment, organizational satisfaction and job satisfaction are difficult to directly affect by management actions because they are outcomes of complex relationships involving individual, organizational and external factors. Nevertheless, the data show that there are factors largely under the direct control of the organization's management that significantly influence organizational commitment, organizational satisfaction and job satisfaction.

For instance, job characteristics are the second most important factor impacting on job satisfaction and indirectly affect turnover intention. This suggests that if jobs are redesigned to provide more desirable characteristics perceived by employees, such as greater autonomy or variety, then increases in job satisfaction will result. Thus, management or policy makers should take consideration in job characteristics as a critical determinant to enhance engineers' job satisfaction and retain them in the public sector.

Leader consideration has a direct positive effect on job satisfaction which in turn has both direct and indirect inverse effects on turnover intention. This suggests that perceived consideration by the supervisor may favorably affect an individual public sector engineer's desire to leave. Providing welfare of the group and trusting employees, and giving the support and helpfulness, creating friendly and warm situation to the individual may all indirectly contribute to reduced turnover of Thai public engineers.

The results show that opportunity for advancement is the most important predictor of organizational satisfaction and has an interactive effect in explaining job satisfaction. The organization must also be aware of the beneficial effect which promotion to higher position may have in relation to reducing turnover intention. Although not all public sector engineers can be supervisors or promoted higher, the potential for promotion to that position may, in the short run, increase an individual's organizational satisfaction and favorably impact upon turnover.

Another point is that perceived pay is still the significant factor affecting turnover intention through both job and organizational satisfaction, although small. Dissatisfied employees may focus on the relative low income, and this leads to desire to leave. Increase the level of income is not easily practical way to solve this problem. The reason is that government pay is constrained pay rigidly set by a complex and controversial process. In Thailand, civil service, military and judicial service employees are each covered by a different pay system. Increase in federal pay for both increased organizational satisfaction and decreased quit rates in the public sector is not readily practical in terms of budgetary impact. Thus, the management of each organization may take any actions in other organizational factors to increase the perceived pay of Thai public engineers.

Although uncontrollable by the management or policy makers' direct actions, external employment opportunity apparently has an indirect effect on turnover intention. The individual engineer's perception of external employment opportunity appears to

indirectly act on turnover intention through its direct effect on organizational commitment. The high perception of external employment opportunity is associated with decreased organizational commitment that is in turn related to an enhanced desire to leave. This logical situation shows the external factor to influence the sensitivity of turnover to organization. The management or policy makers must pay attention to execute other organizational factors to increase commitment, to decrease turnover and also to reduce external employment opportunity.

2. Implication for Future Studies

A number of limitations existing relative to this present study may provide extension and direction for future research.

One limitation is to mostly focus on engineers' attitudes in civil service in *Bangkok* at one point in time. Only 30 percent of questionnaires were returned from outside of *Bangkok*. Civil service employees may or may not be typical of other public sector employees. The external environment may affect their work attitudes, thus it would seem highly appropriate to explore some of these questions among military service employees or civilian employees in the other parts of Thailand. In assessing the generalizability of the findings reported as earlier, geographical heterogeneity of the samples is needed for future research.

Another limitation of this study is based on a cross-sectional research design. Different results may have been found in a longitudinal study examining the same variables. Future research should test the present model with a longitudinal design. The present study is a first step toward identifying the different antecedents (job vs. organizational attitudes) that contribute specific attitudes, such as job satisfaction or organizational commitment in relation to turnover intention.

Work commitment is found as a significant variable related to the prediction of turnover intention. As with prior research, this variable is important in the relationship between satisfaction and commitment, particularly in the study of professionals including engineers. Thus, extensive research should focus on the work commitment in examining the causal links between these attitudes.

Like continuance commitment, other two themes of organizational commitment: affective and normative, also provide valuable insight into the employee-organization link, and are indicators of turnover. It is possible that engineers remain with the Thai public sector because of strong affective commitment or strong normative commitment. More research may give better understandings of the commitment-turnover link when two organizational commitments are considered in the samples of public sector engineers.

During the last decade, Thai public engineers' turnover has remained a major problem, even though, the government has increased benefits for specific positions including engineers. In order to alleviate this situation, the government will adopt a new

government salary structure and compensatory rewards that reflect the current market, improving the bureaucratic system and human resource development as indicated in the Thailand's Eighth National Economic and Social Development Plan (1997-2001). Similar to several studies (e.g. Office of the Civil Service Commission, 1988; 1995; 1996), this paper is an attempt to provide some empirical data in predicting the causes of engineers' turnover, in the hope that management or policy makers will develop successful programs in order to keep engineers in their positions as well as attract new ones to the Thai public sector. Moreover, this study also provides the application of a western theoretical framework to a developing country, and hopes that the western model may be beneficially conducted in similar settings like Thailand.

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APPENDIX A

Questionnaire

Impacts of Job and Organizational Satisfaction, and Organizational Commitment on Turnover Intention in Thai Public sector Engineers

This questionnaire is prepared by Miss Nipha Kittiruengcham as part of her thesis for the Department of Management, Concordia University, Canada.

Engineers in the Thai public service are the most likely of all civil service employees to quit their jobs every year. This study expects to learn which factors affect their turnover and to help the Thai government develop programs not only to attract but also to retain them in the Thai public service.

Almost of all questions need a simple check mark. Your cooperation would be much appreciated. All information will be in confidential so your name is not required.

Please return the completed questionnaire in the enclosed envelope. Thank you for your participation and your time.

PART 1 Please answer the following questions.

1. Age
 - a. 25 or under
 - b. 26-35
 - c. 36-45
 - d. 46-55
 - e. Over 55

2. Gender
 - a. Female
 - b. Male

3. Marital Status
 - a. Single
 - b. Married
 - c. divorced/widowed

4. Monthly Salary
 - a. Under 10,001 baht
 - b. 10,001-20,000 baht
 - c. 20,001-30,000 baht
 - d. Over 30,000 baht

5. How long have you worked in the Thai public sector? _____ years.

6. Job Title : _____

PART 2 Please response to the next four questions by checking the appropriate box.

How would you rate your chances of still working for your organization:

	Very Good 1	Good 2	Possible 3	Not So Good 4	Bad 5
7. Three months from now					
8. Six months from now					
9. One year from now					
10. Two years from now					

PART 3 With respect to your own feelings about the job, please indicate the extent to which you agree or disagree with the following statements by checking the appropriate box.

	Strongly Agree 5	4	3	Un- decided 2	Strongly Dis- agree 1
11. The job is fascinating.					
12. The job is routine.					
13. I have the chance to do the creative job.					
14. I have the chance to get the respected job.					

	Strongly Agree	Un-decided	Strongly Dis-agree		
	5	4	3	2	1
45. It wouldn't be too costly for me to leave my organization now.					
46. Right now, staying with my organization is a matter of necessity as much as desire.					
47. I feel that I have too few options to consider leaving this organization.					
48. It would be very hard for me to leave my organization right now, even if wanted to.					
49. One of the few serious consequences of leaving this organization would be the scarcity of available alternatives.					

PART 6 In this part, a number of statements relate to aspects of a job. Please describe your job by checking the accuracy or inaccuracy of each statement in the appropriate box.

	Very Accurate	Uncertain	Very In-accurate		
	5	4	3	2	1
50. The job requires me to use a number of complex or high-level skills.					
51. The job requires a lot of cooperation with other people.					
52. The job is arranged so that I do not have the chance to do an entire piece of work from beginning to end.					
53. Just doing the work required by the job provides many chances for me to figure out how well I am doing.					
54. The job is quite simple and repetitive.					
55. The job can be done adequately by a person working alone, without talking or checking with other people.					
56. The supervisors and co-workers on this job almost never give me any "feedback" about how well I am doing in my job.					
57. This job is one where a lot of other can be affected by how well the work gets done.					

- 58. This job denies me any chance to use my personal initiative or judgment in carrying out the work.
- 59. Supervisors often let me know how well they think I am performing the job.
- 60. The job itself provides very few clues about whether or not I am performing well.
- 61. The job gives me considerable opportunity for independence and freedom in how I do the work.
- 62. The job itself is not very significant or important in the broader scheme of things.

Very Accurate	4	Uncertain	2	Very Inaccurate
5		3		1

PART 7 The following questions refer to your relationships with your immediate supervisor. Please indicate your feeling you think most appropriate.

- 63. My supervisor schedules the work to be done.
- 64. My supervisor decides what shall be done and how it shall be done.
- 65. My supervisor looks out for the personal welfare of group members.
- 66. My supervisor puts suggestions made by the group into operation.
- 67. My supervisor is friendly and approachable.
- 68. My supervisor treats all group members as his/her equals.
- 69. My supervisor gives advance notice of changes.
- 70. My supervisor helps me overcome problems which stop me from carrying out my task.
- 71. My supervisor refuses to explain his/her actions.
- 72. My supervisor acts without consulting the group.

Strongly Agree	4	Un-decided	2	Strongly Disagree
5		3		1

	Strongly Agree	Un-decided	Strongly Dis-agree		
	5	4	3	2	1
73. My supervisor lets me alone unless I ask for help.					
74. My supervisor is the person who the employee confides in about employee's personal life.					

PART 8 The following questions refer to your relationships with your supervisor and your colleagues. Please indicate your feeling you think most appropriate.

	Daily	Sometimes	Seldom	Never
75. How often do you talk with your supervisor about your work?	4	3	2	1
76. How often do you talk with your supervisor about things other than work?	4	3	2	1
77. How often do you get together with your supervisor outside of work?	4	3	2	1
78. How often do you get together with your co-workers outside of work?	4	3	2	1

	Strongly Agree	Un-decided	Strongly Dis-agree		
	5	4	3	2	1
79. People in my work unit are friendly and helpful.					
80. I feel that I am really a part of my work unit.					
81. I have to work close with others to do my job well.					
82. I have confidence and trust in the people in my work unit.					

PART 9 Please indicate the extent to which you agree or disagree with your pay and your opportunity for advancement by checking the following box from the indicated scale.

	Strongly Agree	Un-decided	Strongly Dis-agree		
	5	4	3	2	1
83. Income is inadequate for normal expenses.					
84. Retirement plan is satisfying.					
85. My pay is less than I deserve.					

	Strongly Agree	Un-decided	Strongly Dis-agree		
	5	4	3	2	1
86. As working as hard as other employees, I am paid less.					
87. As working as hard as other employees, I am paid more.					
88. My pay makes my life more comfortable.					
89. Opportunity for advancement is good.					
90. Promotion is based on ability.					
91. The chance for promotion is good.					
92. Promotion policy is unfair.					

PART 10 The following questions are several statements regarding your job. Please check your response in the appropriate box.

	Strongly Agree	Un-decided	Strongly Dis-agree		
	5	4	3	2	1
93. My job is well within the scope of my abilities.					
94. I feel that I am overqualified for the job I am doing.					
95. I do not anticipate any problems in adjusting to work in this organization.					
96. I have all the technical knowledge I need to deal with my current job.					
97. I feel confident that my skills and abilities equal or exceed those of my colleagues.					
98. My past experiences and accomplishments increase my confidence that I will be able to perform successfully in this organization.					
99. I could have handled a more challenging job than the one I am doing.					
100. Professionally speaking, my job exactly satisfies my expectations of myself.					

