

# Chapter 24

## Differences in the Factors Influencing Job Satisfaction Among Scientists and Engineers

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### ABSTRACT

*Factor analysis indicates that two factors account for significant variations in job-related satisfaction among scientists and engineers. Economic factor consists of job salary, job benefits and job security. Non-economic factor includes responsibility, intellectual challenge, contribution to society, independence, upward mobility, and location. The influence of these factors on overall job satisfaction is different for different individuals. The authors' analysis indicates that scientists and engineers whose job satisfaction is influenced by economic factors include non-U.S. citizens, males, individuals under the age of 30, individuals with Master's degrees or higher, computer and mathematical scientists, individuals working for established businesses and individuals with high job satisfaction. On the other hand, scientists and engineers whose job satisfaction is impacted by non-economic factors include U.S. citizens, females, individuals with Bachelor's degrees, individuals over the age of 30, and scientists and engineers working for start-ups.*

### 1. INTRODUCTION

Researchers and practitioners across disciplines have studied job satisfaction that impacts individual and organizational well-being such as performance and life balance. Studies show a strong correlation between job satisfaction and performance, particularly in complex jobs (Judge et al, 1997). Absenteeism, stress, and health in the workplace have also been linked to job satisfaction (Mansell et al, 2006). A critical sector that requires increased analysis regarding job satisfaction and motivation is the high-tech sector

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in the United States as it needs to be globally competitive. The science, technology, engineering and mathematics (STEM) labor force is a significant source of innovation in the United States. In addition, the growth in science and engineering jobs are expected to grow by 17 percent between 2008-2018, exceeding non-STEM job growth projections by 7% (Langdon et al, 2011). Because scientists and engineers play a key role in the innovative competitiveness of the U.S. economy, their salaries and benefits exceed those of the non-STEM labor force by 26% (Langdon et al., 2011). Despite the high tech sector's socio-economic importance and growth, concern over the supply shortage of scientists and engineers persists (Haltiwanger et al, 2014). Therefore, the condition of science and engineering workforce is monitored as an international priority (Roberts, 2002).

The purpose of this paper is to examine variations in the influence of economic and non-economic factors on job satisfaction among U.S. scientists and engineers and identify job and employee related variables that influence the variations. This paper is organized into six sections. In the next section, we review the literature followed by objectives of the paper. We discuss the methodology and analysis of results in subsequent sections. We close this paper with conclusions in the last section.

## **2. LITERATURE REVIEW**

An exhaustive amount of research exists on job-related satisfaction, much of which can be traced back to the two-factor theory of Frederick Herzberg in his study of motivation and hygiene factors (Herzberg et al, 1959). Subsequent research dealt with satisfaction because of differences between a person's existing and ideal job conditions in the range of affect theory (Locke, 1976), job traits and individual psychological conditions (Hackman and Oldman, 1975), individual disposition (Judge et al, 1997), and management commitment to process (Rodgers & Hunter, 1993).

Despite the breadth of research, traditional and contemporary theories in job satisfaction and motivation conflict on the roles of economic and non-economic factors. For instance, while the acclaimed two-factor theory (Herzberg et al., 1959) and self-determination theory (Deci & Ryan, 1985; 2002) argue that financial benefits do not play a role in individual satisfaction, Adam's (1965) equity theory and Porter and Lawler's (1968) discrepancy theory claim that financial benefits, in fact, do play a role along with psychological benefits in determining levels of satisfaction. While these conflicting theories do not cancel each other out, they instead highlight the need for further research on individual preferences relating to economic and non-economic factors.

In the outset of an individual's career, research indicates that economic and non-economic factors come into play in career decisions and job sorting based on an individual's perceived value of their benefits in the work environment (Agarwal & Ohyama, 2013). Since benefits and job environment differ between startup and established firms, employees can sort by differing individual motives and perceived utility of benefits (Özcan & Reichstein, 2009; Elfenbein, Hamilton, & Zenger, 2010). A steady set of heterogeneous motives prior to job and field entry are accounted for in several studies (Killingsworth, 1987; Hwang, Mortensen, & Reed, 1998; Halaby, 2003; Cable & Edwards, 2004). Therefore, it can be safely concluded that individuals generally pursue jobs that most closely match their preferences.

Once on the job, studies also suggest that economic and non-economic factors impact employee satisfaction depending on individual preferences. For instance, entrepreneurs indicate a greater desire for independence and risk (Stewart Jr. & Roth, 2001; Shane, Locke, & Collins, 2003), while exhibit-

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