

## Should I stay or should I go? A study of IT professionals during a national crisis

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### Abstract:

**Purpose:** The purpose of this paper is to discuss two important behaviors related to job mobility in the IT profession, namely, changing jobs to move to another organization (turnover) and changing the profession entirely (turnaway), during a national crisis. Based on the theoretical foundation of the push–pull–mooring perspective, a research model is developed that includes professional self-efficacy (PSE), job insecurity (JI) and job satisfaction (JS) as important antecedents. **Design/methodology/approach:** Using a positivist approach and a survey method, the authors analyzed data from IT professionals from different economic segments in Brazil. Data collection occurred in two distinctive moments of the largest crisis in modern Brazilian history – a pre-awareness moment (first half of year 2015) and a crisis-conscious moment (first half of year 2016). **Findings:** The findings reveal that PSE negatively influences JI and positively influences JS, JI positively influences turnover intention, and JS negatively influences both turnover intention and turnaway intention. The effect of the national crisis was observed in that it further accentuated the intention of IT professionals to leave the profession. Another effect was related to age, as older professionals are less willing to turn over but more willing to turn away. **Research limitations/implications:** Besides developing a parsimonious model to study both the intention to leave the organization and the intention to leave the profession, the study sheds light on how IT professionals react to economic crises and how the reaction varies by age. **Practical implications:** The study puts to question the common belief that IT professionals are secure in the job market due to high demand for their skills and investments made by organizations to keep them on the job. Employers must pay attention to JI and turnover/turnaway intentions. **Originality/value:** This study is among the few to study JI and aspects of the theory of human migration in IT. It is also possibly the first to discuss the effects of a national crisis on the mobility patterns of IT professionals.

**Keywords:** Job insecurity | Turnover | Perceptions | Developing countries | Job satisfaction | Professional self-efficacy | Information worker | IT profession | Occupational culture | Turnaway | Intentions | Theory of human migration

## Article:

### Introduction

The commitment to attracting, developing and retaining information technology (IT) professionals has been ranked among the most worrisome concerns of CIOs and IT executives (Kappelman *et al.*, 2017). IT professionals also represent a significant resource for the IT organization: in 2016, in the USA, 50.6 percent of a company's IT budget was dedicated to personnel-related expenses – by far the largest percentage of the total IT budget dedicated to a single category (Kappelman *et al.*, 2017). However, retaining good IT professionals is a challenge, because they are highly sought out by the market, leading to their turnover or having the intention to leave the organization (ILO). Furthermore, due to the demands on the IT profession (e.g., long hours of work, pressure to generate quick results, and rapid emergence of new technologies), some may leave the field entirely, leading to their turnaway or having the intention to leave the profession (ILP).

Another major cause of turnover and turnaway is job insecurity (JI). JI has been studied for decades in the management literature as an important antecedent to intention to leave the job (e.g., Ashford *et al.*, 1989; Murphy *et al.*, 2013). However, it has not received much scrutiny in the IT literature. In a recent bibliographical search, we found only a few studies related to JI in IT journals. This may be due to several reasons, such as the facts that the IT profession is in high demand worldwide, many IT professionals are able to negotiate lucrative employment contracts, and many are self-employed. Thus, the perception may be that JI is not a critical issue in the IT profession. This assumption is untested and, therefore, we investigate if JI is a concern for the IT professional and whether JI is associated with ILO and ILP.

We had an unprecedented opportunity to examine JI and other job-related phenomena in an uncertain economic environment, where JI is even more likely to occur. As the IT profession is embedded in the broader economic environment, it is influenced by economic cycles and contingencies as well as regional, national and global events. Thus, depending on the environment, the IT professional is not only likely to experience varying perceptions about jobs, but also develop varied intentions to change jobs or the profession. This is an important concern, as the mainstream IT literature has not given much attention to professionals who work in unstable environments, such as in countries where economic, political and social stability is fragile. BRICS countries (i.e., Brazil, Russia, India, China, and South Africa) are examples of such contexts, and they have played an important role in IT growth in the world (Brown and Brandt, 2014).

We developed our study in Brazil. Brazil has received much attention in the last two decades for its economic growth and social achievements. Its IT sector has been historically strong and provides infrastructure and services to Brazil as well as to other countries. According to the Brazilian Software Companies Association (ABES, 2016), Brazil's IT market reached over \$60bn in 2015 (a 9.2 percent growth as compared to 2014) and ranked seventh largest in the world. In recent years, though, Brazil has faced unprecedented political, economic and social crises with substantial impact on the labor market, including the IT sector. In 2016, IT investments decreased by 3.6 percent as compared to 2015, which resulted in the country falling

two notches in the global IT market ranking (ABES, 2017). Such major changes are likely to have impacted the IT labor force and their job perceptions and intentions. We had the opportunity to collect data from IT professionals in Brazil during the crisis to examine the following research question:

*RQ.* Do the perceptions of IT professionals about job insecurity and other job-related issues during an economic crisis influence their intention to change jobs by leaving the organization or the profession?

We developed a parsimonious model based on the push–pull–mooring perspective (Lee, 1966; Fu, 2011) to relate JI and other job-related perceptions with ILO and ILP. The model was statistically tested using partial least squares (PLS). A total of 291 Brazilian IT professionals were surveyed in two distinct moments of the country's crisis: a pre-awareness moment (first half of year 2015), in which people did not know how severe the crisis was; and a crisis-conscious moment (first half of year 2016), in which the government publicly admitted the critical economic situation, and consequences on businesses and workers became evident.

In the next section of the paper, we provide the theoretical background and discuss how the literature frames the IT profession along with concepts related to ILO and ILP. In the third section, we explain how JI emerges as key to explain ILO and ILP, and provide arguments to develop the full research model integrating JI, ILO, ILP, other constructs and controls. In the fourth section, we describe the research method and the operationalization of constructs. In the fifth section, we provide various analyses and results. After that, we discuss the results, implications for theory and practice, limitations and future research avenues. Finally, we provide conclusions.

## **Theoretical background**

The demand for IT professionals exceeds the supply, and supply is declining while demand is rising (Armstrong *et al.*, 2015). Particularly in the USA, worker shortage (Guzman and Stanton, 2009) and retention of the workforce (Ghapanchi and Aurum, 2011) are enduring concerns. However, while organizations have reasons to hire and retain competent IT workers, workers have their own motivations and intentions for staying on the job or leaving it.

Job-related concerns are intimately related to how one frames an individual career. Understanding the relationship between career orientation and effective career transition of IT professionals is a work in progress (Coombs, 2009), but there is evidence that career-related sunk costs and deteriorating economic conditions act as barriers to pursue career changes (Gubler *et al.*, 2014). In the same line, for the IT professional, career satisfaction, professional self-efficacy, threat of professional obsolescence and career investments are important determinants of career commitment (Fu, 2011). One's career orientation can be conceived as the aggregate level of a series of job-related intentions, which may or may not ever be fulfilled. There are four job-related intentions: the worker may intend to remain in the organization and remain in the profession; leave the organization, but remain in the profession; remain in the organization, but leave the profession; or leave the organization and leave the profession. Accordingly, based on Joseph *et al.* (2012) and Joseph *et al.* (2015), we define turnover as when a worker leaves the

organization and remains in the profession, and turnaway as when a worker leaves the profession by moving to another field either inside the organization or across organizational boundaries. In the current study, we are interested in the intention to turn over (ILO) and the intention to turn away (ILP).

IT professionals have high job mobility (Fallick *et al.*, 2006). As early as in the 1990s, managers were striving to keep the turnover rates below 30 percent (Agarwal *et al.*, 2006). The reasons for mobility are manifold, including the very nature of the IT professional, who needs to constantly develop new knowledge and face new challenges (Jacks and Palvia, 2014). Other reasons include the project-oriented nature of IT work (Agarwal *et al.*, 2006) and the competitive and highly demanding labor market that offers alternative work opportunities (Armstrong *et al.*, 2015). The IT labor market has been consistently reported as complex with regard to turnover, thus challenging the management of human resources in organizations (Bernthal and Wellins, 2001). As a knowledge worker (Scarborough, 1999) who performs rather autonomous work and whose work routines are difficult to supervise (Dinger *et al.*, 2015), the IT professional is highly skilled and thrives in an environment that promotes continuous learning, technical competence, creativity and self-management opportunities (Ramakrishna and Potosky, 2003). If management does not address these issues, it is likely that the IT professional will consider leaving the job. We should note, however, that some opposing views exist, as some of the IT work has been characterized as unlikable, low skilled, poorly integrated with the organization and not promising in terms of career paths (Cappelli, 2001).

Generally, an employee intends to leave the job on the basis of fit perceptions (Boon and Biron, 2016). On the other hand, the cost of moving to another organization has been described as one of the weakest forces acting on an employee's commitment decision (Meyer *et al.*, 2018). Thus, most studies on IT professionals' turnover discuss ways to retain them in the organization (e.g., Agarwal *et al.*, 2006; Joia and Mangia, 2017). Ironically, certain organizations may not deliberately focus on retaining their IT workers, such as those with a "task focused," "utilitarian" or "incented technician" organizational mindset (Agarwal *et al.*, 2006). From the workers' perspective, Moore and Burke (2002) describe an opposing force to retention that acts in the workers' interests – leaving the organization may be seen as part of a successful career in the IT occupational culture. Thus, voluntarily moving and changing jobs would be a consequence of the belief that such behavior is evidence of professional competence and, thereby, a successful career. This is the apparent reality in the IT field, where organizations do not strive overly to contain turnover, but recognize that internal and external forces act on individuals in persuading them to change jobs from time to time.

IT professionals' turnaway intention is a less studied topic (Joia and Mangia, 2017). This may be due to the unique features of the IT occupational culture (Guzman and Stanton, 2009), many described above, which are likely to keep workers committed to the profession. The IT profession is both rewarding and challenging, and there is much demand for IT workers. There is heavy knowledge investment made by the worker, leading to sunk costs (Arkes and Blumer, 1985). Another concern is the cost of making career transition decisions (Gubler *et al.*, 2014). Thus, turnaway may be less common than turnover in the IT profession and of less interest in the literature. On the other hand, ILP may emerge due to the fast pace of professional obsolescence in the IT field or due to the need for new challenges and experiences, or even as the result of a

middle-age crisis (Ramos and Joia, 2014). Other factors for ILP include work exhaustion, dissatisfaction with the profession, the need to advance one's career and climb the organizational hierarchy (Mangia and Joia, 2015) and diminished affective commitment to the profession (Brooks *et al.*, 2015).

## **The research model**

In this section, we develop a parsimonious model to explain the emergence of ILO and ILP among IT professionals. The model has several unique features: it includes a small number of clearly defined constructs; it includes JI as a potentially important concern for the IT literature; and it includes as a control the work context characterized by economic recession. The model adopts a push–pull–mooring perspective originally developed to explain human migration (Lee, 1966) and used by Fu (2011) to explain career commitment in the IT profession.

In examining the literature, we found that factors affecting turnover and turnaway can be classified into three dimensions, namely, how well the individual feels prepared for the job, how desirable the job is for the individual, and the individual's perceived future uncertainties about the job. We adopted the push–pull–mooring perspective to further ground the three dimensions. In our context, push factors are those that motivate one to leave the current job; pull factors are those that motivate one to remain in the current job; and mooring factors are those that moderate one's job continuance decisions, i.e., investments made in the current job that are hard to ignore in the pursuit of a job alternative. We identified one theoretically sound construct for each dimension. JI was identified as the construct for one's uncertainty about the current job and was characterized as a push factor; job satisfaction (JS) was identified as the construct for one's job desire and was characterized as a pull factor; and professional self-efficacy (PSE) was identified as the construct for one's job competence and was characterized as a mooring factor.

Two alternatives to the push–pull–mooring perspective were considered but deemed inappropriate for our study. The three-component model of organizational commitment (Meyer and Allen, 1991) can help in framing the antecedents of ILO and ILP. According to the model, job continuance decisions depend on workers' affective commitment to the organization, their obligations toward the organization, and the costs for moving to another organization. However, the model addresses the relationship between workers and organizations rather than between workers and their specific jobs – which is our interest. We also considered Mitchell *et al.*'s (2001) job embeddedness model to explain ILO and ILP. According to these authors, job embeddedness can help explain one's intentions about the job, and it consists of three dimensions: links (to other people, teams and groups), fit (with the job, the organization and the community) and sacrifices (of leaving the job). However, this model also does not focus on workers' job-related perceptions.

### **Job insecurity (JI)**

JI refers to one's "perceived powerlessness to maintain desired continuity in a threatened job situation" (Greenhalgh and Rosenblatt, 1984, p. 438), "a discrepancy between the level of security a person experiences and the level she or he might prefer" (Jacobson and Hartley, 1991, p. 1431), "one's expectations about continuity in a job situation" (Davy *et al.*, 1997, p. 323), "an

overall concern about the future existence of the job” (Rosenblatt and Ruvio, 1996, p. 587) or “an employee’s perception of a potential threat to continuity in his or her current job” (Heaney *et al.*, 1994, p. 1431). These definitions do not make it clear if JI refers to someone losing a current job position for any reason, or to a specific job category being eliminated. With the exception of Davy *et al.* (1997, p. 323), for whom JI “goes beyond concern over continuation of employment with an employer” and involves the assessment of “long-term career opportunities,” most studies have adopted a situational rather than structural perspective, i.e., they are more concerned with the insecurity of one’s current placement than with broader employability. We side with the majority and adopt a situational perspective.

While JI appears to be an important construct to examine in relation to turnover and turnaway, much to our surprise, there are very few published works in the IT literature about JI. An extensive literature search yielded only 15 articles, of which 12 were published in the last ten years, four were conference papers, and only one article was from a journal in the AIS basket. Only three articles addressed the relationship between JI and turnover, and none addressed the relationship between JI and turnaway.

The lack of academic interest in examining JI may be because the IT professionals are usually seen as protected from unemployment due to their highly skilled and organizationally critical routines. Paradoxically, the profession has seen its downturns from time to time, such as with the downsizing of IT departments around 1990 and lower wages throughout that decade (Cappelli, 2001), stagnated and declining IT employment in the USA in the beginning of the 2000 decade (Srivastava and Theodore, 2006), the dotcom bubble burst of the early 2000s (Hirschheim and Klein, 2003), the alleged commoditization of IT (Carr, 2003) and the availability of friendly platforms that enable non-IT workers to develop IT solutions. Such memories suggest that JI may be an erroneously ignored topic in the IT literature, as the heydays may be over and career security should be a concern for IT professionals in an era of few guarantees (Fu, 2011).

### Professional self-efficacy (PSE)

An important question to ask is what influences JI at the level of the individual. Besides organizational performance and environmental uncertainty, which are outside the control of the IT worker, one’s PSE is an important determinant. Self-efficacy is defined as “beliefs in one’s capabilities to organize and execute the course of action required to produce given attainments” (Bandura, 1997, p. 3). As self-efficacy is probably the best-known predictor of individual performance, it should be considered in hiring processes and skills improvement (Blomquist *et al.*, 2016), as well as in explaining work outcomes and satisfaction on the job (Mulki *et al.*, 2008). Motivation to do a task has also been long believed to be an outcome of individuals with high levels of self-efficacy (Ventura *et al.*, 2015), and self-efficacy is reported to be positively related to work engagement (Guglielmi *et al.*, 2012).

PSE is a general term to refer to task-specific cases of self-efficacy across work contexts – it may thus refer, in practice, to using a specific technology, performing a specific process, acting in a specific job position, and so on. As a general concept referring to self-perceptions about task competency, PSE (or its task-specific equivalent, such as computer self-efficacy) is usually positioned as the first factor in complex networks of job-related constructs. For instance, it is

reported as a direct or indirect antecedent for a vast number of job-related phenomena, like mental overload, role conflict, autonomy, social support, work demands, burnout, and engagement, all of which are ultimately related to commitment to the job and job-related behaviors (Ventura *et al.*, 2015). Thus, we postulate that PSE is an important determinant of many job-related perceptions and intentions, and it acts as an anchor for the current job. This allows us to frame PSE as a mooring factor, and as such it should have an indirect influence on ILO and ILP.

The relationship between PSE and JI has been examined to a limited degree in the literature and has seen mixed results (Schreurs *et al.*, 2010). For example, work self-efficacy has been described as moderating the relationship between JI and organizational commitment (Adebayo, 2006). In general, though, anxiety develops when a worker is unsure of personal performance and when JI is present (Burgard *et al.*, 2012). As the IT professional feels the need for both protection and recognition (Dinger *et al.*, 2015), the sense of being able to perform well can be expected to moderate the anxiety of external assessments and JI associated with it. In a recent integrative review of JI (Shoss, 2017), several individual factors are listed as antecedents. Several of these, e.g., perceived employability, training and performance, are related to PSE. Furthermore, organizational citizenship behavior among IT professionals is reportedly low (Moore and Love, 2005), that is, they perform tasks in a largely autonomous fashion. Thus, the sense of performance is highly dependent on the own perception about the ability to perform, and not on what others think. As PSE captures the idea of how well the professional is able to perform on the job, we offer the following hypothesis:

*H1. PSE negatively influences JI.*

#### Job satisfaction (JS)

While JI is largely absent in IT research, JS is among the most studied constructs of subjective well-being at work (Weikamp and Göritz, 2016). According to the literature, it is among the most consistent antecedents and mediators of job-related perceptions, intentions, decisions, and actions. This is no surprise, since JS is “an accumulation of sentiments related to the job being performed” (Kianto *et al.*, 2016, p. 623), including the greatest amount of positive aspects that an employee finds in a job and in the work environment (Meneghel *et al.*, 2016). As such, people will remain in the organization if they are satisfied with their jobs, otherwise they will leave (Bergiel *et al.*, 2009). This is broadly due to JS having an affective component – the overall positive emotional appraisal of the job – and a cognitive component – the logical and rational evaluation of job conditions (Moorman, 1993). A recent review by Kianto *et al.* (2016) concurs that JS is closely related to a myriad of key ingredients of one’s attachment to the job and to the organization, such as pleasure from work, positive appraisals about performance, positive feelings about the job, positive assessments about job outcomes, experiencing well-being, developing motivation, and strengthening organizational commitment – which ultimately bind an individual to the organization and act against turnover. JS can be thus conceived as a pull factor motivating one to remain in the job.

As PSE can result from having the right set of skills in the right job, IT professionals whose career orientation is compatible with their current job tend to report high JS (Igbaria *et al.*, 1991).

IT professionals also have higher JS in companies with higher levels of maturity, i.e., relatively free of formal controls, and lower JS where more formal behavioral controls are in place (Ply *et al.*, 2012). IT workers arguably have higher PSE in a more mature IT environment and hence higher JS. Furthermore, the sense of being able to perform well seems to contribute to enhancing JS due to increasing the likelihood of a positive performance assessment from supervisors and peers as well as receiving tangible and intangible rewards. Thus, we offer the second hypothesis:

*H2. PSE positively influences JS.*

Turnover intention (ILO) and turnaway intention (ILP)

ILO seems to be positively related with JI (McKnight *et al.*, 2009). Murphy *et al.* (2013) support the concept of JI being a push factor. They hypothesize that when workers perceive their jobs as secure, their job embeddedness becomes high, which in turn increases their intention to remain in the organization; on the other hand, the perception of high insecurity tends to cause disembeddedness, which negatively influences the intention to remain in the organization. However, their empirical findings ultimately revealed that, during an economic recession, JI negatively influences job search behavior. In such situations, IT professionals who believe their jobs are threatened will adopt different strategies depending on their propensity to accept risks and on how confident they are about finding another position without incurring unacceptable costs (e.g., moving to another city, accepting lower salaries and fewer benefits, etc.). In line with this, Staufenbiel and König (2010) claim that JI may motivate professionals to prove that they are valuable and deserve to keep their jobs, as long as they believe that this will be an effective approach to reduce the chances of losing the job.

We contend, therefore, that IT professionals with JI perceptions may develop different patterns of ILO depending on the individual's propensity to take risks and the demand in the job market. In periods of socio-economic stability, when the demand for IT professionals tends to be high, switching jobs would involve relatively low costs. Thus, in such conditions, risk aversion would have a weaker impact on the relationship between JI and ILO. However, in periods of economic turmoil, when the cost to leave the job tends to be higher, professionals with high levels of risk aversion would probably adopt defensive strategies discussed by Staufenbiel and König (2010). Finally, there is always room for the possibility that IT professionals may believe that career success requires changing jobs from time to time (Moore and Burke, 2002). In this case, an individual's ILO would be independent of JI perceptions.

Thus, it seems that there are arguments both in favor of a positive and a negative relationship between JI and ILO. While a relationship seems to exist, its direction is not clear, preventing us from developing a directional hypothesis. Instead, we offer the following hypothesis and allow our data to indicate the nature of the relationship:

*H3. JI is related to ILO.*

ILP is a new concern in the IT field (Joia and Mangia, 2017). Given that the study of JI is also embryonic in the IT field, research is beginning to appear about the interplay of JI and ILP both in normal times and during crises. We posit that the influence of JI on ILP in times of socio-

economic crisis such as the one described in Murphy *et al.* (2013) may be twofold: on the one hand, considering jobs in another profession may increase the chances that the IT professional switches jobs without assuming unacceptable costs; on the other hand, JI may become a pervasive phenomenon in the entire IT profession, rather than being confined to the individual's current employer. For instance, companies tend to adopt cost-cutting measures to weather an economic crisis. In the IT profession, measures may include outsourcing jobs to companies that take advantage of economies of scale and that are located where labor costs are lower. As a country-wide, socio-economic crisis would put substantial pressure on companies in the same sector, IT professionals who perceive that their jobs are threatened may feel the need to look for jobs in other fields, thus increasing their chances of finding better work opportunities. We thus hypothesize:

*H4. JI positively influences ILP.*

JS is an important predictor of ILO (Thatcher *et al.*, 2002). The higher the satisfaction with the job, the lower is one's turnover intention (Dinger *et al.*, 2015), whereas frustrated or dissatisfied IT professionals are likely to leave their jobs at least when the labor market is favorable (Moore *et al.*, 2016). This is not in contrast with the fact that successful IT professionals may also seek to turn over, given that successful professionals are not necessarily the satisfied ones. And as for the relationship between JS and ILP, dissatisfaction with the job may be one of the key antecedents for ILP (Joia and Mangia, 2017). Thus, in order to investigate the contribution of JS toward ILO and ILP, we hypothesize:

*H5. JS negatively influences ILO.*

*H6. JS negatively influences ILP.*

The six hypotheses collectively represent a push–pull–mooring model for ILO and ILP based on job-related perceptions. The hypotheses include one mooring factor (PSE), one push factor (JI) and one pull factor (JS) to explain a worker's migration intention in the form of ILO or ILP.

#### Control variables

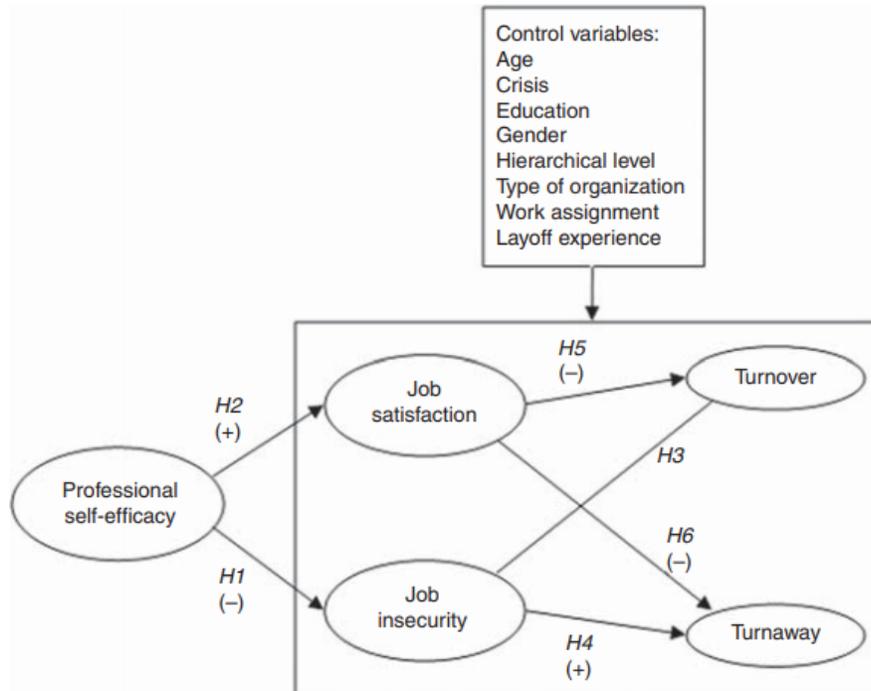
The following control variables are included in the model: IT professional's age, education, gender, hierarchical level in the organization, the type of organization where the professional works (whether public, private or mixed), if the work assignment is full time or part time, and whether the professional was laid off in the past. Given our interest in testing the possible effects of an economic crisis on job-related perceptions and intentions, we also included a control variable for the crisis in Brazil as represented by two distinctive moments: a pre-awareness moment and a crisis-conscious moment. In the literature, these variables have been shown to influence a myriad of individual-level job-related phenomena (e.g., Böhm *et al.*, 2014; Murphy *et al.*, 2013). As the crisis and the IT sector in Brazil are of special interest here, we discuss them next.

#### The IT sector and the crisis in Brazil

The Brazilian IT sector is an important driver of the country's economy. As a result of decades of developing its own technology aided by governmental protection of manufacturers, the Brazilian IT companies have developed greatly and provided most of the resources for internal consumption. Until 1991, federal regulations forced the country to develop its own IT solutions in hardware and software, what may have caused the development of an idiosyncratic IT knowledge base (Bellini *et al.*, 2013). The unique knowledge base attracted worldwide attention, to the extent that only one decade after the country lifted sanctions against the international IT industry, Brazil was fully integrated with the world. The country was soon reported to be among the "major destinations" of offshore IT-related work from US companies (Carmel and Agarwal, 2002). The Brazilian IT sector employs some 1.3m workers (Garbin, 2016), but their shortage is a concern (Joia and Mangia, 2017), with an estimated deficit of 408,000 professionals by 2022 and corresponding losses in business opportunities (Softex, 2015). In the social domain, in recent years, Brazil invested heavily in programs geared toward increasing employment and fighting extreme poverty and inequality. However, after 2013, anti-corruption investigations unveiled the involvement of businessmen, public agents and politicians in massive bribery, embezzlement and money laundry schemes. At the same time, public money was used to help ideologically aligned countries such as Venezuela, Bolivia, Cuba, Mozambique, Angola, and others. As a result, the country witnessed a steep decline in economic and social indicators.

The Brazilian crisis marked by a rapid transition from economic development to severe economic recession started to be noticed in April 2013. By the middle of 2015, this critical situation was also acknowledged by the government. The year 2016 was marked by events that led to the largest public demonstrations in the country's history. By May 2016, Brazilians had witnessed a series of scandals involving public institutions and businesses, dozens of high-profile individuals were arrested, and the president was impeached. Widely reported in the global media were effects like: soaring inflation, unemployment, business closings, products and services withdrawn from the market, urban violence, institutional instability, migration of highly skilled workers to other countries, and so on.

Our research model was tested with data collected from Brazilian IT professionals in 2015 and 2016, so it is possible that a significant amount of variance in the various constructs is due not only to the hypothesized theoretical relationships, but to differences in perceptions and intentions caused by the crisis. In fact, literature suggests that JI and its outcomes are influenced by economic recessions (Murphy *et al.*, 2013), and JS is influenced by the work environment (Meneghel *et al.*, 2016) and person-environment fit (Boon and Biron, 2016). Further, as suggested by De Moura *et al.* (2015), two opposite forces may shape the perspectives of IT professionals: job-related perceptions may be influenced by the background environment, whereas personal traits may be more stable and less subject to environmental contingencies as compared to other professionals. As we had the opportunity to measure all constructs before and after the crisis upheaval, we were able to control for the maturation of the crisis. Figure 1 summarizes the research model.



**Figure 1.** The research model.

**Notes:** Professional self-efficacy, job satisfaction and job insecurity are modeled as perceptions. Turnover and turnaway are modeled as intentions

## Method

The data for this study were collected as part of a much larger project, namely, the World IT Project (Palvia *et al.*, 2017). The World IT Project recently gathered data about the IT profession in 37 countries. While the project collected data from IT employees on a wide array of constructs (including organizational, technological and individual issues), this study utilizes the Brazilian data for only a select number of constructs, i.e., those needed for our model. A standard validated data collection instrument, prepared in English by the project leaders, was shared with all research teams that joined the project. The Brazilian researchers joined the project in 2014.

### Operationalization of constructs

All constructs were operationalized and measured with previously validated five-point agreement scales. Schaufeli *et al.*'s (1995) GBQ self-efficacy subscale was adopted to measure PSE. This scale includes the following items: "In my opinion, I do a good job," "At my work, I feel confident that I am effective at getting things done," "I feel I'm making an effective contribution to what this organization does" and "I have accomplished many worthwhile things in this job." JS was measured with Seashore *et al.*'s (1983). It is composed of the following items: "In general, I like working here," "All in all, I am satisfied with my current job" and "In general, I don't like my current job." JI was measured with a formative four-item scale adopted from Elst *et al.* (2014) containing the following items: "I am worried that future technology advancements may pose a threat to my job," "I believe that other people may be able to perform my work activities," "I am concerned that my job may be eliminated soon" and "I am concerned that my job may be outsourced soon." ILO and ILP were measured with three-item scales

adopted from Moore (2000). ILO items were: “I will be with this organization one year from now”, “I will take steps during the next year to secure a job at a different organization” and “I will be with this organization five years from now.” ILP items were “I will be working in the IT field one year from now,” “I will take steps during the next year to secure a job outside the IT field” and “I will be working in the IT field five years from now.”

The control variables were coded as categorical variables. The crisis variable was coded as a dummy variable. It was used to indicate whether the respondents manifested their job-related perceptions and intentions in the first moment (early in 2015, the pre-awareness moment) or in the second moment (early in 2016, the crisis-conscious moment).

### Data collection

IT professionals in Brazil were contacted through professional associations and universities that offer IT-related undergraduate and graduate degrees. They were contacted via electronic mail, virtual social networks and conferences. The study also benefited from the help of an online portal for executives and business people, which promoted the data collection effort among target IT professionals. IT professionals who took part in the survey were also asked to promote it to peers.

Our message to potential participants included a link to the instrument implemented as a Google Forms document. Caution was taken to ensure that the meaning of all items in the original English-based questionnaire was preserved after translation into Portuguese. Special attention was given to phrasing the items in order to ensure theoretical consistency and professional colloquialism. We did it by having three Brazilian IT scholars independently translating the items and subsequently merging the translations after discrepancies were resolved. We also compared the translation with other instruments in the literature and submitted the instrument to face validation by a Brazilian IT research team that included two faculty members, four PhD candidates, several MSc and BSc students, one CIO and one systems analyst. We concluded that the instrument was reliable and sufficiently clear for application in the field.

Proper disclaimers regarding the confidentiality of personal information and the voluntary nature of the study were provided to the participants. As an incentive, participants who completed the survey received free registration to a 2016 IT conference held in Brazil. This particular action resulted in increased participation and greater probability that the respondents were IT professionals actually living and working in Brazil.

### Sample

We received 385 questionnaires. After removing incomplete cases, outliers and individuals who reported spending less than 50 percent of their time in IT-related work, we obtained a final sample of 291 cases. Outliers were identified with Mahalanobis distance score (Riani *et al.*, 2009) with a 0.001 significance level.

Among the valid cases, 25 percent (73) were from the first round of data collection (January–May 2015) and 75 percent (218) from the second round (January–April 2016). The age

distribution was as follows: 28 percent were below 30 years, 37 percent were between 30 and 40 years, 24 percent were between 40 and 50 years, and 11 percent were above 50. The female proportion was 13 percent, which is consistent with recent surveys of IT professionals by Brazilian consulting companies and professional magazines, as well as with academic studies (e.g., Joia and Mangia, 2017). More than 82 percent of the respondents reported having at least a college degree, 53 percent had a master's degree, and 6 percent had a doctoral degree, again in line with national statistics (Joia and Mangia, 2017). Almost 79 percent reported total work experience between 5 and 29 years, and 77 percent had between 5 and 29 years of IT experience – meaning that most people had worked almost entirely in the IT field. Further, 61 percent worked full time, and 65 percent worked in management positions. Virtually all areas of IT jobs were represented, i.e., programming, systems analysis, networks, strategy, project management, etc. About 37 percent worked for IT companies, and 63 percent in various industries, such as government, education, retail, manufacturing, healthcare, finance, services, media, utilities, and entertainment. Nearly 27 percent worked in public organizations or government agencies. About half of the organizations had 500 or more employees, 9 percent had between 5,000 and 10,000 employees, and 11 percent had more than 10,000 employees.

## Results

Table I shows descriptive statistics for the main variables of interest. Several of them were not normally distributed. In addition, the model includes both formative and reflective constructs. For these reasons, PLS was a better choice for analyzing the data than traditional covariance-based structural equation modeling. PLS is a technique that does not assume a common factor model, and it has been reported to generate consistent results even for small sample sizes and when the data fail to adhere to the assumptions of multivariate normality and independence of observations (Chin, 2010). Furthermore, PLS can readily handle models that include both formative and reflective latent variables (Chin, 2010). We used SmartPLS v2 to calculate parameter estimates for the model.

**Table I.** Descriptive statistics for the main variables

Variable	Total sample <sup>a</sup>		Pre-awareness moment <sup>b</sup>		Crisis-conscious moment <sup>c</sup>	
	Mean	SD	Mean	SD	Mean	SD
Professional self-efficacy (PSE)	4.22	0.49	4.15	0.45	4.25	0.50
Job satisfaction (JS)	4.09	0.73	3.93	0.82	4.14	0.69
Job insecurity (JI)	2.79	0.74	2.80	0.71	2.78	0.75
Turnover intention (ILO)	2.51	1.06	2.50	1.16	2.52	1.03
Turnaway intention (ILP)	1.86	0.88	1.81	0.87	1.88	0.88

Notes: <sup>a</sup>n=291; <sup>b</sup>n=73; <sup>c</sup>n=218

## Measurement model

Because the sample included two groups of IT professionals, it was important to confirm that there were no group-related differences in the measurement models of the variables and that our parameter estimates were not biased by observed heterogeneity (Haenlein and Kaplan, 2011). Haenlein and Kaplan (2011) proposed a method that employs Box's *M* test to detect a significant difference in inter-item variance-covariance matrices calculated for each subpopulation represented in a sample. Statistically significant differences indicate that

measurement invariance is compromised and the meaning of a construct could be different in groups that compose the sample. Nevertheless, Box's *M* test is very sensitive to violations of the multivariate normality assumption (Mertler and Vannatta, 2017), which were present in our data. Given this limitation, we conducted, for each indicator, a Levene's test, which is also parametric but more robust to non-normality, and two nonparametric tests – the independent-sample Mann–Whitney U tests, and Fligner-Killeen's test (Conover *et al.*, 1981) – in order to check for observed heterogeneity. As 17 tests were conducted in total with the same data, we adopted the Bonferroni correction. All results were non-significant, suggesting that the observed variables followed the same probability distribution in the two groups of IT professionals, and, as such, the construct measures did not vary across these groups.

To assess the measurement model, we followed procedures described by Wetzels *et al.* (2009) and performed confirmatory factor analysis. The corresponding cross-loading matrix showed that all items loaded appropriately on their respective latent variables. The outer loadings related to each reflective measurement scale were above 0.7 and statistically significant ( $p < 0.001$ ). As shown in Table II, composite reliability ( $CR > 0.7$ ), average variance extracted ( $AVE > 0.5$ ) and Cronbach's  $\alpha$  ( $\alpha > 0.7$ ) are above the limits suggested in the literature (Chin, 2010). Also, the square root of AVE for each latent variable (shown in the diagonal) is greater than the correlations of each variable with other variables. Taken together, these results indicate that the constructs of the proposed model have adequate internal consistency and discriminant and convergent validity.

**Table II.** Results for the measurement model

Reflectively measured latent variable	Items	Loadings (min., max.)	AVE	CR	$\alpha_c$	1	2	3	4
PSE	4	0.70, 0.85	0.61	0.86	0.81	0.78*			
JS	3	0.86, 0.90	0.78	0.91	0.86	0.35	0.88*		
ILO	3	0.84, 0.87	0.74	0.90	0.83	-0.30	-0.63	0.86*	
ILP	3	0.89, 0.91	0.80	0.92	0.86	-0.28	-0.34	0.24	0.89*

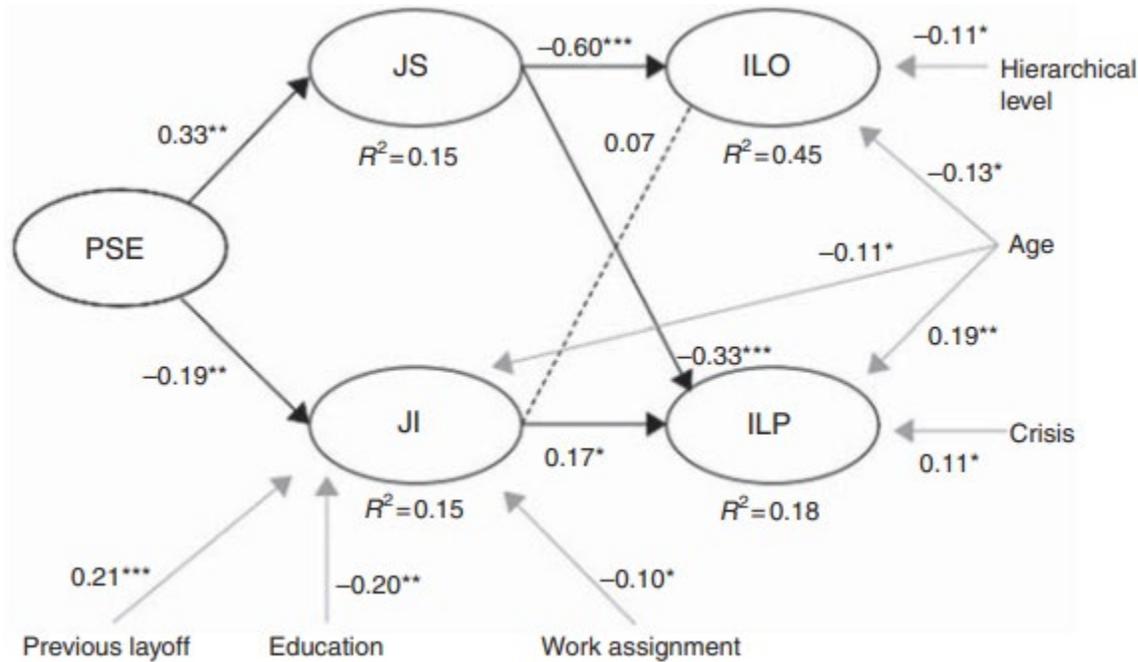
Notes:  $n=291$ . \*Square root of AVE

The correlations in Table II show that IT professionals' ILO or ILP are negatively associated with PSE and JS. Furthermore, the two intentions (ILO and ILP) and the two perceptions (PSE and JS) are positively related to each other. The analysis of the structural model, presented next, explores these relationships in more detail, taking into consideration the measurement models of the latent variables.

As recommended in Hair *et al.* (2012), we assessed multicollinearity for the formative measurement model of JI. The VIF indexes for the indicators varied from 1.05 to 1.70, well below the cutoff values recommended in the literature. The indicator weights were between -0.13 and 0.78, the lowest two being not statistically significant. After we removed the corresponding indicators, the remaining weights were 0.75 and 0.34 and statistically significant ( $p < 0.05$ ). These items refer to an individual's concern with the possibility of the job being eliminated or outsourced.

## Structural model

To assess the significance of path loading estimates for the structural model, we employed bootstrapping techniques with a sample size of 291 and 1,000 resamples. Figure 2 shows the results.



**Figure 2.** The structural model  
**Notes:**  $n = 291$ . \*  $p < 0.05$ ; \*\*  $p < 0.001$

The proposed model was able to explain a considerable proportion of the variance of ILO ( $R^2=0.45$ ). Although the corresponding values for the remaining exogenous latent variables were lower ( $R^2=0.15$  and  $0.18$ ), all hypotheses except one received significant statistical support.

PSE had significant influence on both JS and JI. The corresponding path loading estimates were statistically significant ( $0.33$  and  $-0.19$ , respectively;  $p < 0.01$ ). Hence, as observed in the theoretical review, IT professionals who have higher PSE tend to report higher JS and lower JI. Hypotheses  $H1$  and  $H2$  were empirically supported.

JI had significant influence on ILP ( $0.17$ ;  $p < 0.05$ ), that is, IT professionals who have stronger concerns about the possibility of losing their jobs (higher JI) are more likely to take steps to leave the profession. It is important to reiterate that, in our study, JI refers to one's concerns about the job being eliminated or outsourced soon. Thus, hypothesis  $H4$  was empirically supported. On the other hand, we did not find a statistically significant relationship between JI and ILO. Recall that we were equivocal in our arguments about the direction of the relationship between JI and ILO and did not specify a particular direction. Our skepticism was supported in not being able to obtain statistical significance for  $H3$ .

JS was a strong predictor of ILO and ILP, with statistically significant effects of  $-0.60$  and  $-0.33$ , respectively ( $p < 0.001$ ). The results support both  $H5$  and  $H6$ , that is, IT professionals who have higher JS are less likely to report ILO or ILP.

Table III shows the indirect effects of PSE on ILO and ILP as calculated with the bootstrapping technique. As expected, PSE had a statistically significant negative effect on ILO through JS, that is, JS mediates the effect of PSE on ILO. On the other hand, the effect of PSE on ILP is mediated by both JS and JI, although the effect mediated by JI was only marginally significant. Thus, the stronger the beliefs of IT professionals about being able to properly perform their assigned tasks, the less they intend to leave their organizations or the IT profession.

**Table III.** Indirect effects of PSE on ILO and ILP

Path of indirect effect of PSE	Mean	SD	T	p-value
JS→ILO	-0.20	0.04	-5.32	0.00
JS→ILP	-0.11	0.03	-3.64	0.00
JI→ILO	-0.01	0.02	-0.77	0.44
JI→ILP	-0.03	0.02	-1.72	0.09

Note:  $n = 291$

Some control variables had statistically significant effects on the endogenous latent variables. Older employees ( $-0.11$ ;  $p < 0.05$ ), more educated employees ( $-0.20$ ;  $p < 0.01$ ) and those who work full time ( $-0.10$ ;  $p < 0.05$ ) tend to report lower values of JI. On the other hand, professionals who have been laid off before are more likely to report higher levels of JI ( $0.21$ ;  $p < 0.001$ ). Both age and hierarchical level in the organization seem to negatively influence ILO ( $-0.13$  and  $-0.11$ , respectively;  $p < 0.05$ ), that is, older IT professionals and those who occupy higher positions in the organizational hierarchy are less likely to intend to leave the organization. However, older professionals tend to report higher ILP ( $0.19$ ;  $p < 0.01$ ), i.e., they may want to leave the profession entirely. The intention to leave the IT profession was also higher for professionals who answered the questionnaire in the 2016 crisis-conscious moment than for those who answered the questionnaire in the 2015 pre-awareness moment ( $0.11$ ;  $p < 0.05$ ). Therefore, the heightened level of the economic crisis seems to affect ILP, but not ILO.

While Joseph *et al.* (2015) found different job mobility patterns between male and female IT professionals, and Ryan and Harden (2014) observed significant differences between IT males and females in terms of job embeddedness, we did not find gender differences – similarly to Joia and Mangia (2017), whose recent study was also conducted in Brazil. We were also not able to detect differences based on the type of organization (whether public, private, or mixed). The literature suggests that beliefs and attitudes might not differ in public and private organizations (Dinger *et al.*, 2015); however, we expected that, in Brazil, employees in private and public organizations would manifest very different mindsets and behaviors, since those in the public sector have more job stability. In fact, it is very unusual to see public employees in Brazil thinking of quitting their jobs (Joia and Mangia, 2017).

## Discussion

We developed a parsimonious model where PSE influences both JS and JI, which in turn influence ILO and ILP. That is, we modeled job-related perceptions as antecedents of job-change intentions at a high level of abstraction. We were also able to frame the model within a push–pull–mooring perspective, and additionally we tested the effect of the maturation of a national crisis on the main constructs.

There may be additional constructs that are relevant to explain ILO and ILP, such as workload/exhaustion, work–family conflict, enjoyment at work, professional obsolescence, professional growth, job embeddedness, career vs organizational embeddedness, professional identification, and organizational commitment. In this study, we focused on high-level constructs that address one’s broad appraisals about the self (PSE) and broad perceptions about the job (JS and JI), whereas other studies include lower-level constructs and address very particular situations. We favored parsimony over complexity, while not compromising the total variance explained in the dependent variables. Complex networks of constructs, on the other hand, pose difficulties in understanding and demonstrating model integrity. As an example, Joia and Mangia’s (2017) study involves a large number of constructs modeled as direct antecedents of ILP. They include eight direct antecedents of turnaway intention. Conceptually, though, there is great complexity in demonstrating that the eight factors are necessary, non-overlapping, and sufficient to explain turnaway intention. Moreover, their model does not include two important constructs necessary to explain ILO and ILP, i.e., PSE and JI, and does not include mediating effects. A parsimonious model such as ours in terms of the number of constructs and mediating paths obviates these difficulties while also explaining a good amount of variance in the intended phenomena.

We found that PSE negatively influences JI (*H1*), i.e., the more the professionals perceive themselves as competent in performing job-related tasks, the less insecure they feel about the job. This is in line with Dinger *et al.*’s (2015) argument that the sense of being able to perform a set of tasks mitigates the anxiety related to external assessment, which is in turn associated with JI. Essentially, when one feels competent in performing a specific task (assuming that the task remains relevant to the organization) and feels that the organization and others in the organization depend on the worker, this eventually leads to a sense of security and of being less disposable. We also found support for *H2*, i.e., PSE positively influences JS. Essentially, the sense of being able to perform well contributes to increasing satisfaction with the job. This may result from the feeling that the work performed well will be valued positively by peers and supervisors, and thus a feeling of self-actualization. Together, the results of *H1* and *H2* suggest that PSE needs to be constantly nurtured on the job, thus representing personal investments and psychological reinforcements that eventually result in mooring effects.

Regarding the influence of JI on ILO (*H3*), we were not able to detect one. While hypothesizing a relationship between JI and ILO, we were ambivalent about the direction of the relationship, especially at the time of an economic crisis. The statistical results were not significant. The “no relationship” result is somewhat inconclusive, since our theoretical review addressed different streams of research and different findings about JI – one in normal times and another during economic recessions. When one feels insecure about the job, a possible behavior is not necessarily to search for an alternative workplace, but to work harder instead to demonstrate that you are needed in the organization. Interestingly, though, different professionals may have different coping behaviors when exposed to JI. The possibility that professionals have a repertoire of possible behaviors in the presence of JI may have blurred our results. Further investigation is required, especially since JI has not been the focus of research in the IT field. JI seems to be a new phenomenon for practitioners and researchers in the IT field, and as such respondents may not have formed grounded perspectives on how it relates to job-related

behaviors. It may also be that our sample describes an unusual group of IT professionals, particularly those who currently need to deal with an unprecedented multi-order crisis and are thus unprepared to deal with the consequences on their jobs, organizations and careers.

As for whether JI positively influences ILP (*H4*), the hypothesis was supported. JI may also point to a lack of job embeddedness, particularly in the “fit” dimension, i.e., with the job, the organization and the community (Mitchell *et al.*, 2001), leading to a desire to leave the profession. This is an important finding in that it reveals that our respondents do not see the IT field as a source of continued job security or as a safe shelter during economic crises, and therefore they would consider changing between professions. They may take this action in spite of the historic perceived job security, autonomy and lucrativeness of the IT field. This particular result supports JI as a push factor, as originally posited.

Regarding the negative influence of JS on ILO (*H5*) and ILP (*H6*), the hypotheses were supported. As expected, the more an IT professional is satisfied with the job, the less is the inclination to leave the organization or the profession. Thus, overall, satisfied workers tend to leave their jobs and their organizations less frequently than the unsatisfied ones. Although retaining IT professionals should not be seen as “the one best practice” in all organizations at all times, a good advice for organizations that want to preserve their valuable IT human resources is to make sure that they have timely assessment of employee satisfaction, and actions and rewards in place to develop positive job-related perceptions. Rewards, among other factors, can lead to JS (Aziri, 2011) and in turn affect job-related behaviors. Of course, this advice comes with a caveat. Organizations can only do so much. At some point, the nomadic culture of IT professionals may push them to seek new opportunities in spite of success and satisfaction at the current job or organization. Consistent with our results, JS is a pull factor that motivates one to continue on the job.

Besides the six hypotheses, we had a particular interest in the background national crisis, and deployed it as a control variable. We found that the maturation of the crisis in Brazil had no impact on ILO, but impacted ILP. This may be explained by the insecurity one feels about losing the job in a moment when finding job alternatives is harder due to less opportunities and increased competition. In the case of Brazil, besides the monetary compensation provided by a job, workers also have a series of other benefits that accumulate based on their tenure length in the same organization. As such, leaving the organization is not attractive, and especially so during an economic crisis. Moreover, changing between organizations may mean moving to another community, and this is usually associated with new patterns of personal expenses in a difficult economic period. Additionally, while changing jobs between organizations represented an opportunity for better salaries in the past, the current situation in the country is the opposite as organizations are replacing their human resources with cheaper labor. Therefore, leaving the organization is not attractive during the evolution of a crisis, but moving to another profession may emerge as an alternative, especially if the whole IT sector is affected by the crisis.

### Contributions to theory

This study makes a number of contributions to the IT literature. First, it discusses the role of JI in explaining job-mobility intentions. Second, it is among the very few to address both the intention

to turn over and the intention to turn away in a single study, thus presenting a richer picture of the mobility phenomenon. Third, it is arguably the first study to address the influence of an economic crisis on job-related perceptions and intentions of IT professionals. Fourth, it develops a parsimonious model to achieve such intents; parsimony is always a desired attribute of a model especially when it provides a good explanation (i.e., explained variance) of the phenomena of interest. And fifth, our study is among the few to use the push–pull–mooring perspective of human migration to discuss mobility in the IT profession, thus contributing to an embryonic research tradition.

### Implications for practice

There are several implications for practice from our results. For example, PSE is an important antecedent for job-related perceptions and intentions. It affects both JS and JI and indirectly affects ILO and ILP. While employers may not want to keep every single IT employee on its rolls, there are many who they may want to keep and nurture. Several mechanisms exist for raising PSE and need to be evaluated, e.g., professional development programs, education and training, provision of resources, and mentoring. By the same token, JS is an important deterrent to ILO and ILP. Thus, besides improving PSE, other means need to be examined to boost JS. For example, greater autonomy and feedback can result in higher JS (Morris and Venkatesh, 2010). Other strategies may include direct rewards and appreciation as well as a greater role in decision making.

We found equivocal results for the effects of JI. We could not find a relationship with ILO, although one may exist but was not identified in our data. We did find, however, a relationship between JI and ILP. In any case, it would make sense for organizations to reduce the level of insecurity especially if it is not warranted. Even if uncertainties may exist in the organization, participation and communication may help dissipate some of the insecurities (Elst *et al.*, 2010).

In normal times, the literature describes IT workers' attachment to the profession and a nomadic behavioral pattern in crossing the organizational boundaries in search of career success. However, we found that a national crisis may not motivate them to leave the organization and instead drive them to another profession. Managers should thus be aware of this completely different pattern that may manifest among the IT workforce and find ways to address it. Measures to deal with this situation are certainly complex as it is contrary to expected behavior. The greatest concern is that the IT professional would lose job loyalty and embeddedness, and begin to develop other skills while at the job.

### Limitations

One limitation of our study is its limited generalizability to other contexts. Our study provides important findings for IT professionals in Brazil, an emergent economy and a context that has been neglected in the established IT literature. While our findings are likely to be generalizable to similar economic and cultural contexts, the transferability to wider contexts, such as more developed economies, should be undertaken with caution.

Another limitation refers to the control variables. There may be other control variables influencing ILO and ILP, but they were not available to us due to the use of a standard instrument from a larger study. For instance, we do not know for how long our respondents were working in their organizations, their salaries, their levels of job and organizational embeddedness, their career orientation and personality, or their attitudes toward the organization. On the other hand, we were able to collect data on a number of important control variables.

At the time we conducted our study, the World IT Project involved only the collection of cross-sectional data. As a result, Brazilian IT professionals provided information only once and were not identified in the survey instrument. This precluded the possibility of conducting a long-term panel study, which would allow us to evaluate how the variables in our model changed within the same subjects as the crisis unfolded. Consequently, our analysis could only identify average differences between groups of respondents, but not how the crisis affected the same individuals over time.

#### Future research

There are numerous avenues for further research. We enumerate a few. First, job mobility behavior is an important topic and needs to be investigated in different scenarios and contexts to develop a deeper understanding, e.g., in different economic conditions, national and cultural settings, and periods of crisis. Brazil is a global player; while it has similarities with many countries, it also exhibits differences. Thus, our findings need to be compared with other contexts. We acknowledge the concerns raised by Davison and Martinsons (2015) about contextual particularism, and exhort researchers to conduct such studies in various other environments.

Second, our investigation into the effects of a multi-order economic crisis may trigger another line of investigation. As crises develop in different parts of the world, the effects of a profession-related, field-wide crisis on career intentions and decisions is worth examining. Riaz *et al.* (2016) describe one such crisis in the US banking sector during the global financial crisis as well as the actions of some actors to defend their positions. Our findings regarding ILP suggest some upheaval in the profession during certain crises. In this regard, it would be profitable to map the preferred alternative professions desired by the IT workforce, estimate the economic impact of IT professionals migrating to other professions, and understand how IT expertise may fit with the requirements and expected performance in alternate professions.

Third, the current unpleasant realities in Brazil may be causing an exodus of qualified professionals. Even if the internal labor market for IT professionals is not seriously affected at this moment, the crisis is not only marked by economic recession, but also by urban violence, institutional instability, ideological conflict, increasing taxation of commercial transactions and state services, and so on; thus, both the economy and the larger society are affected in profound ways. Therefore, brain-drain effects may be under way in Brazil or may occur soon. Future research on job-related issues of IT professionals in countries facing difficult economic and social times may thus focus on the motivations and destinations of professionals who are leaving or plan to leave the country. As a note of caution, brain-drain effects should not be confounded with the increased mobility in global labor markets.

## Conclusions

Our study was motivated by several aspects of the IT profession: the worldwide imbalance between supply and demand, the struggle of many organizations to retain their IT human resources, the IT occupational culture, the phenomena of turnover and turnaway, and the intriguing silence in the literature about JI of IT professionals. Specifically, we studied how the perceptions of IT professionals about their PSE, JI and JS during an economic crisis influence their intention to change jobs by leaving the organizations or the profession. The empirical study was conducted in Brazil, which has a historically prominent IT sector and has recently seen major swings in its economy. Fortuitously, it provided us an excellent natural control to examine job-related perceptions and intentions during times of economic upheaval.

This study contributed to the literature by developing and testing a parsimonious model to explain the intentions to turn over and turn away based on the theoretical foundation of the push–pull–mooring perspective. Three contributions of our work stand out. First, JI is an emerging and important concern in the IT field, and was explicitly modeled. Second, we not only examined turnover intentions, but also turnaway intentions, which have received very little attention in the literature. Third, our study was in the middle of an unfolding multi-order national crisis and we were able to examine its effects on job perceptions and intentions. Our study has implications for countries with similar economies and socio-cultural contexts. We believe such research forays into various regions of the world should continue to enrich our understanding of global job mobility issues.

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