

# **Factors and Factor Clusters Most Influential in Introduction and Global Fate of Innovations and their Organizations – IV**

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## Factors and Factor Clusters Most Influential in Introduction and Global (Survive/Terminate) Fate of Innovations and their Organizations<sup>1</sup> – IV<sup>2</sup>

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### ABSTRACT

Analysis of factors (antecedents) influencing the introduction and fate of innovations and their organizations (I&O) has been limited. Most of the innovation literature has focused on introduction and dissemination but not fate of I&O. It often found ideology and politics were not important in introduction of I&O. Glor (2017a, b) studied six factors influencing the introduction and survival/mortality of the first introduction in USA and Canada of ten public sector I&O introduced by the Government of Saskatchewan, (GoS), a Canadian provincial government, 1971 to the present. She reported assessment of their antecedent factors before introduction (Time 1) and those factors again at the time of survival/termination, 15 to 46 years later (Time 2). Introduction and survival/termination are defined by their appearance in/disappearance from *Budget Estimates*, annual reports and *Public Accounts*. I&O studied were the full sub-population of income security I&O introduced. A new, valid instrument was used to assess the influences, examining six factors and some clusters thought by three experts to have influenced their introduction and fate. The expert raters responded to 1267 statements (items), 555 pairs between times 1 and 2 distributed on five-point Likert scales. For all ten I&O, the factors ideology, politics, economy, external support, resources and effects were considered. In this paper, factors and clusters of factors are explored to attempt to predict survival or termination in Time 2, using means, analysis of variance (ANOVA), paired t-test and logistic regression analyses. Clusters were considered, such as external/internal clusters, external cluster and external support factor compared to economy factor and internal cluster. The best combination of factors and clusters for predicting introduction of I&O in Time 1 was found to be economy factor and internal cluster (resources, effects). The best combination for predicting fate (survival/ termination) in Time 2 was political cluster (ideology, politics) and external support factor. These results are important for practitioners, to point the way to successful introduction of I&O and for scholars, to understand important influences on fate. The dominance of resource factors in introduction was as expected and consistent with the literature. The capacity to predict either survival or termination had not been studied before: Political factors dominated survival and termination.

**Key words:** Public sector innovation, innovation measurement, innovation factors, innovation antecedents, Saskatchewan, innovation factor clusters

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<sup>2</sup> IV refers to this paper being 4<sup>th</sup> in a series. This paper was presented to the annual conference of the Northeastern Political Science Association (NPSA), Montreal, Canada, November 10, 2018.

## Introduction<sup>3</sup>

Limited work has been published on the factors key to the successful introduction (creation/adoption), implementation, achieving of objectives and survival/termination of I&O. In the public sector, Berry and Berry (2013) suggested that the factors involved in the dissemination of innovation are political, economic and social. In terms of the adoption of innovations, de Vries, Bekker and Tummers (2015: 147) and Berry and Berry (2013) suggested, slightly differently, that the major antecedents of innovation are external and internal. Their definitions of internal and external are different from those used in this paper, however. De Vries, Bekker and Tummers (2015) defined four types of innovation: process (administrative, technological), product or service, governance and conceptual. Berry and Berry (2013) defined external in diffusion terms as national interaction or regional diffusion and internal as related to the jurisdiction. Glor (2014a) suggested that employees, functions, survival and possibly other not yet specified factors are important. This paper examines empirically three types of factors influencing the introduction and survival/termination of I&O—two types of external factors and one type of internal factor. The innovations examined are policy/program innovations, while organizations are the administrative units delivering them.<sup>4</sup> The paper uses an instrument developed for the purpose that quantifies the factors. It assesses 550 paired statements, organized into six factors influencing the introduction and survival/termination of the sub-population (all) income security innovations introduced by the GoS, 1971-82. It explores whether the factors predicted the introduction and fate of the I&O.

*Innovation* refers to the conception and implementation for the first, second or third time in a government's community of significant new services, ideas or ways of doing things as policy in order to improve or reform them and involves taking risks (Glor, 1997: 4). This paper studies the first time. This definition is different from that of Walker (1969) and Rogers and Kim (1985), who defined innovation as anything perceived by the innovators and their organizations as new; for example, "a program or policy which is new to the states adopting it, no matter how old the program may be or how many other states may have adopted it" (Walker, 1969: 881). Osborne (1998) defined "total innovation," as innovations new to the innovating organization and offering a new service to a new group. Glor added the qualifications about taking risks and the focus on invention and early adoption. Rogers (1995) and Walker (1969) were interested in dissemination, here it is invention and early adoption, the factors that lead to its introduction and influence its fate. Berry and Berry (2013) suggested that definitions focused on the first few adopters were used more before 1990 and that the focus has been primarily on dissemination since then. In my opinion, this change has been due to the promotion of New Public Management and financial constraint as innovation. Including laggards shifts the focus to dissemination of innovation, as opposed to its introduction. Although study of dissemination is important, there is still much to learn about invention and early adoption and—a new focus—on the fate of I&O. *Organization* refers to a group of persons united for a purpose; in this case, an organizational unit and people structured to deliver an innovation. This paper studies the five organizations delivering five innovations introduced for the first time in Canada and USA. The

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<sup>3</sup> The following abbreviations are used in the paper: GoC=Government of Canada; Government of Saskatchewan=GoS; SS=Department of Social Services; FIP=Family Income Plan; SIP=Senior Citizens' Benefits Program; ESP=Employment Support Program; WCB=Saskatchewan Workers' Compensation Board.

<sup>4</sup> Their expenditures could be traced in the GoS budget Estimates and Public Accounts (actual expenditures).

approach has potential to inform understanding of risks of innovating and fate of early adopters. A *government community* is the group to which a government compares itself and/or with which it works. The GoS's community was Canadian provinces, Government of Canada (GoC) and American state and federal governments.

**Factors Identified in the Literature.** Factors explaining innovation adoption have been studied in the innovation, innovation dissemination, organizational change, demography and complexity literatures. **Policy/program innovations.** Researchers have studied the dissemination of innovative *policies*; for example, Collier and Messick (1975) studied the first social security adoption among the 59 countries with formal political autonomy at the time of adoption, Brown et al. (1979) studied 147 agricultural cooperatives in Sierra Leone, Tolbert and Zucker (1983) examined civil service reform in 167 cities, and Glor (1997, 2002) identified 159 GoS policy, program and administrative innovations, 1971-82. While both practitioners and scholars assume that the purpose of innovation is to improve organizational performance (Borins, 2014: Chapter 2, 22), none has considered the survival of innovations as a performance issue.

**Innovation dissemination.** Gray (1973: 1174), Berry and Berry (2013: 1) and Glor (2015) have observed that innovation researchers typically do not study invention of policies, or early adoptions, but dissemination of policies. Dissemination has been studied two ways—the earliness of adoption (e.g. Walker, 1969; Glor, 1997, 2002) and the comprehensiveness of adoption/dissemination (Berry and Berry, 2013 review). Glor (1997, 2002) used the same definition of innovation as is used in this paper. Berry and Berry used and recommended the latter approach: every time an innovation was adopted, it was considered an innovation, and even laggard governments that adopted innovations late were considered innovative. De Vries, Tummer and Bekker (2016, 2018) have prepared a meta-analysis of research in this area. While this approach would allow comparison of the year in which an innovation was adopted by one government to the year it was adopted by other governments and development of adoption rankings, this has not typically been done: Glor (1997, 2002) may be the only researcher to have taken this approach. For the most part, how widely innovations was adopted was of interest.

Berry and Berry (2013) summarized the external and internal factors affecting adoption as identified in the policy dissemination literature. They identified three models of external policy innovation dissemination research, studying external factors, internal factors and a unified model that they developed. Study of *external factors* initially developed two diffusion models—national interaction and regional diffusion. The national model posits that the federal government is the most important factor in policy dissemination. The regional diffusion model posits that geographic proximity of other adopting governments is the prime determinant in adoption and assumes some jurisdictions are leaders and others laggards. The regional approach was subsequently used to develop a unified model, with national diffusion factors having influence throughout the country equally and regional factors being the behaviour of states influencing the state next to it. National factors were found to be more important than regional influence (also Lieberman and Shaw, 2000). Because Canada is more decentralized than the USA in the social policy domain, this needs to be explored for Saskatchewan (Sask.). For the GoS, the next-door provinces are Manitoba and Alberta and national policy, especially national funding, also had an important influence. Berry and Berry recommended a unified model, addressing both internal determinants and external diffusion (2013: 2). Both are studied in the instrument used. *Internal*

*factors* were defined as the political, economic and social characteristics of the *jurisdiction* (2013: 12). In his reviews of literature on innovation in local governments, Walker (2003, 2007) concluded internal antecedents mattered more than external factors in administrative innovations (organizations here). This paper defines external factors differently than they did: factors extant in the government's environment—ideology, politics, economy and external support, and internal factors are internal to the government, and include resources and effects of I&O.

**Administrative innovations.** Based on literature reviews and study of service, administrative innovations—in English local governments, Walker (2003, 2007) concluded that **internal antecedents** were more important than external for administrative innovations. Important management factors for innovations were role of teams and teamwork (people), pilots and experiments, projects, and a variety of forms of project management (2003: 93). He concluded: the antecedents of different innovation types are complex and complementary relationships among innovation types which might not be as widespread as theorized (2007: 591). Iain Gow (2018) commented:

Borins is no doubt right that bottom-up innovations are more numerous than top-down central ones, but this requires important qualifiers. Most of the bottom-up innovations that he identified were managerial, coming in the wave of New Public Management reforms inspired by Osborne and Gaebler's 1992 book, *Reinventing Government*, and dealing with efficiency, savings and service to clients (Hughes et al., 2013: 13–14). On the other hand, the European Innobarometer found that the single most important driver of innovation was reported to be changes in legislation and regulations and budget restrictions (European Commission, 2011). They also found that larger, central organizations were more likely to innovate and that state organizations were just as likely to innovate as decentralized public sector institutions (Gow, 2018: 444).

**Organizational change.** There are two main types of organizational change literature, identifying selection and adaptation mechanisms of organizational change (Barnett and Carroll, 1995). Innovation is often considered an adaptation mechanism. Selection mechanisms determine organizations' fates and include resources, politics, organizational age and size, and environmental and ecological processes (Baum, 1996).

The latter, **organizational demography literature**, suggests innovation is an adaptation mechanism that affects organizational mortality. The measure of survival utilized is mortality and the approach is demographic, the study of populations. Organizational demography is based on studying all organizations in a population.<sup>5</sup> **Complexity Literature.** Torugsa and Arundel (2016) studied factors associated with complexity and how complexity affected innovation outcomes in the most significant innovation in the work groups of 4,369 Australian government employees. They defined complex innovation as incorporating more than one type of innovation and found positive correlation with the variety of beneficial outcomes, a result of both policy and management interest.

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<sup>5</sup> A considerable number of studies in the literature consider a full population (e.g. Glor, 2013; Kuipers et al., 2018). Glor identified eight public sector population studies, such as all German (Adam et al., 2008) and American (Carpenter & Lewis 2004) federal agencies. She established a mortality rate for normal organizational populations.

**What.** Most study of innovation has been concerned with case studies of innovation and their comparisons, public sector entrepreneurship and innovative organizations (Borins, 2014: Chapter 2: 2-3). Borins noted researchers tend to study only one of these types. Knill and Lenschow (2001) and Glor (2014 a, b; 2015) suggested expanding that range. Glor (2018) drew on these literatures to identify six possible factors influencing the fates of five innovations and five organizations that survived/terminated. This paper further explores how the six factors apply to the ten case studies in order to identify what kinds of factors (clusters) there are. It looks at (1) external versus internal clusters, political vs support clusters, (3) whether external factors alone could predict fate, and (4) how influences changed from the period of introduction (Time 1) to survival/termination (Time 2).

The paper: (1) applies the Glor methodology to explore explanatory factors for the introduction and survival/termination of ten income security I&O; (2) provides a framework for studying the issues; (3) uses the results of completion of the assessment instrument by three expert raters, in writing, which were coded and analyzed; (4) the same statements were assessed for each of the ten cases; (5) reports and discusses the results by factor and I&O; (6) identifies kinds of key independent factors influencing introduction and fate of I&O; (6) compares the influence of the grouped independent factors at the time of introduction to their influence at the time of survival/termination; (8) considers whether the factors and any clusters were able to *globally* predict survival/termination. Global prediction predicts either survival or termination but does not predict the fate of individual I&O.

## The Study

**Research Framework.** Most research frameworks employ one theoretical paradigm, such as institutionalism, rational choice, complexity or contingency theory. Knill and Lenschow (2001) argued that scope of change studied, the theoretical schools chosen, and whether the conceptual schools are structure or agency-based create key differences among studies of change. They suggested that needless contention arose in the literature because authors used only one approach and scope and did not relate their work appropriately to that of other schools studying other levels. Glor (2014 a, b; 2015) also suggested expanding the scope of theoretical schools referenced because study of the fate of innovations and their organizations is so new. She recommended (2014 a, b) using elements from four theoretical paradigms—interpretive, humanist, functional and structural (based on Burrell and Morgan, 1979).

Glor's (2014a) framework for studying the fate of I&O recommends studying case studies, effects on people, antecedent factors and the demography of I&O. This study employs these four approaches. Glor's research framework (2014a, b) and Glor and Rivera's (2015) proposal for research and their four approaches frame the paper. An *interpretive approach* considers case studies where there is a plausible link between an organization innovating and surviving/disappearing, preferably matched with case studies of normal organizations (qualitative comparative analysis) (Strauss and Corbin, 1998). A *humanist approach* focuses on employees, e.g. managers (Damanpour and Schneider, 2006, 2009), employees who implemented the innovations, how the innovations and organizations affected them and how they affected the innovations and organizations. A *functionalist* approach, the most researched, explores the factors correlating highly with increased and less innovation and organizational

mortality. A *structural* approach focuses on the fate of structures—including innovations and innovating organizations—and their demography, measured by founding and mortality rates (Glor, 2014a). Most studies have employed only one or two approaches but considering more issues should create better understanding.

The *null hypotheses* examined in this research are as follows:

1. The mean factor scores for the six factors were the same in times 1 and 2.
2. The factors could not be clustered.

In keeping with Glor's (2014a) recommended framework, the paper considers ten case studies (interpretive approach), independent factors influencing the dependent variable of innovation fate (functional approach), and the fate of I&O (structural demographic approach). These cases are the full sub-population of income security I&O introduced by the GoS. They were policy and program innovations and their organizations.

*Research Questions.* A previous paper (Glor, 2018), established that the instrument could distinguish among the factors influencing the ten I&O, that different factors were important in the introduction in Time 1 and survival/termination in Time 2 of I&O, and that the factors could distinguish between I&O that survived and those that were terminated as two different groups. This paper explores the factors involved and addresses three research questions:

*Question 1: Are there types of factors? If so, what are they?*

*Question 2: Are there clusters of factors? If so, which ones?*

*Question 3: Can political and support cluster and external support factor predict global (survival/termination) I&O fate?*

This paper identifies the importance of the explanatory factors for the introduction and survival/termination of income security I&O. The paper (1) provides a framework for studying the issues; (2) uses a new assessment tool; (3) reports and discusses the results; (4) compares the influence of the independent factors at the time of introduction to their influence at the time of survival/termination; and (5) discusses the instrument's use in other contexts.

*Case Studies.* The only population (government) for which all the innovations have been identified is the GoS, 1971-82. Glor and colleagues (1997, 2002) identified 160 policy, program and administrative innovations (Glor, 1997: Table 1; 2002:142-3), including the five innovations studied here. The definition of innovation they used is the one used here. This research did not, however, systematically identify the determinants nor what happened to the innovations. Such information is required to understand factor clusters.

Highly innovative income redistribution programs in the Canadian and American context (Glor, 1997), the need to subsidize these groups (poor working families, unemployables, permanently injured workers) and the principles involved became staples of the federal welfare state in Canada 25 years later. In Sask., all but one was dismantled during the 1980s. Sask., well known for innovating hospital and medical insurance, was the first government in North America to establish innovations of the type of the Family Income Plan (FIP), Employment Support Program (ESP) and Workers Compensation Board (WCB); tied for first to introduce cost-shared

generously-subsidized day care, and second to establish a program of the type of the Seniors Income Support Program (SIP), after the Government of Canada Old Age Security (OAS) and Guaranteed Income Supplement (GIS) programs.<sup>6</sup> The principle guiding the Blakeney government programs was that anyone could need government help during their lives and only income rather than income and assets should determine eligibility. This approach acknowledged income drops in Sask. caused by its boom-bust economy, driven by weather and markets for primary products such as potash, uranium, oil and gas.

The *five income security innovations* (case studies) were (1) A day care subsidy for low and low-middle income parents, for which federal cost-sharing was secured, thus allowing a major expansion. Previously only very low income parents on welfare were subsidized; (2) FIP, a subsidy for the working poor with children; (3) SIP, a subsidy for very low income seniors; (4) ESP, the first provincial program providing long-term unemployed and “unemployables” on welfare with voluntary short-term work, with personal support, thus reintroducing them to the work force and making them eligible for federal Unemployment Insurance; and (5) the first conversion of an employer-sponsored WCB from a pure insurance scheme (lump-sum payments for loss of life and injuries to specific body parts) into a combined insurance and long-term income replacement scheme, subsequently adopted by all provinces and many USA states (Sask. WCB, 1980, 1997). *Five organizations*. Four of the Sask. innovations were delivered by the Department of Social Services (Social Services) and the fifth by an administrative tribunal, the WCB. Part of the WCB innovation was delivered by Social Services. The delivery organizations were also within these organizations. The next, neoliberal government abolished the four popular Social Services innovations and their four organizations during the 1980s.

Using accessible documents (annual reports, budget estimates, public accounts), personal knowledge,<sup>7</sup> and creating descriptive statistics, this retrospective study identified factors contributing to the introduction and to the fate of the ten income security I&O. These I&O were *chosen* from the 159 Blakeney government innovations *because* (1) they were highly innovative; (2) they encompassed all of the government’s income security innovations (a sub-population); (3) the Department of Social Services innovations were controversial in the eyes of the next, Devine government, so it could be determined whether or not information remained transparent (the Devine government passed legislation that made reorganizations more opaque, and refused to answer most questions in the Legislature or by media about reorganizations); (4) this government and two of its successors were well documented in published works; and (5) the Glor was familiar with these innovations.<sup>8</sup> Consisting of four separate questionnaires, the instrument (Glor, 2017b) studies ten case studies for effects on people; factors influencing their introduction and fate, and fates. I&O usually changed name or department or legislation when they were terminated. Key independent factors affecting the introduction, survival and disappearance of I&O were studied.

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<sup>6</sup> Glor (1997) reported Sask. as first for day care cost-sharing but Manitoba was first, a couple of months earlier, during the same year. Data is reported yearly, so they were tied for first. Source: Ron Hikel.

<sup>7</sup> Only recent documents are available online. Earlier documents are rarely available outside Sask.

<sup>8</sup> Having worked as Social Services Budget Analyst in the Department of Finance; done a special project on the WCB while there; and having worked on the WCB innovation while in Executive Council.



## Methodology

Information on I&O was found in Glor (1997, 2002), Harding (1995), Budgetary Estimates, Public Accounts and annual reports. Research was conducted on the ranked time of introduction among Canadian and American governments (e.g. Glor, 1997, 2002; Hum, 1985a, b; Harding, 1995). I&O studied are all of the income security innovations introduced by the government. They are not a sample, but the full sub-population of income security innovations introduced by the GoS.

A quantitative research design requires models that have a lag between the independent and dependent variables to ensure that the measures precede their hypothetical performance effects. Internal and external controls are required to address possible confounding effects due to management, organization, and the environment. Longitudinal data address these central characteristics of causation, but also permit consideration of longer term effects of innovation, particularly when studies are trying to identify lingering effects of changes. They also permit study of causal direction—does innovation result in changes in performance or vice versa? In the GoS, for example, the day care organization, delivering a different program, was reorganized before the innovation was introduced. Data sets need to be able to test the interactions between variables required to tease out relationships. Researchers must collect clear and accurate measures of their variables, and have sufficient external constraints in the data sets to capture the circumstances in which organizations operate and that contribute to or constrain innovation. Good internal and external measures of management and organizational context are also needed (Andrews, Boyne and Walker (2011: 7). Berry and Berry (1990, 1992, 2013); Wright, Erikson and McIver (1987); Lieberman and Shaw (2000); Arsneault (2000); and Boehmke (2009) found both internal and external factors were important in determining whether innovations were adopted. Glor (2015) concluded researchers should address different dimensions of impacts, because gain in one dimension (e.g. efficiency) may be realized by sacrificing another (e.g. equity or equality). Both external and internal data was collected in this research.

**Measures.** A literature search, informants, experience and Glor's hypotheses informed factors that could have influenced the introduction and the fate of I&O. From them, an instrument was developed (Glor, 2017a) which measured two types of independent variables, primary attributes and secondary attributes. *Primary attributes (variables/factors)* affect all of the innovations and their organizations more-or-less equally. They were thought to be ideology, politics, external support and economy. *Secondary attributes (factors)* affect innovations and organizations individually and possibly differently, and require scoring of individual I&O. They were thought to be resources and effects. The instrument explored the following six factors.

*Ideology* was the strength of the party in power's ideology and the strength of the public's support for the ideology as measured by the consistency of federal and provincial election results. Wright, Erikson and McIver (1987) found public opinion surveys were the best measure of dominant ideology, but surveys were not available for Sask. Berry et al (1998) used results of federal elections compared to results of state elections as a measure of ideology, supplemented by other measures. Five measures were used, including theirs'. Ideology was measured as a primary attribute for organizations but secondary for innovations. For example, raters were asked to agree or disagree with these two statements: "The organization's approach

integrated well with the dominant ideology in the province” and “The organization’s approach matched the ideology of the government.”

*Politics* were measured by (1) the effect of federal government ideology on provincial governments; (2) how long governments were in power; (3) the ratio of time in power between the innovating and the next government’s (three elections versus two but in years the neoliberals were only in power one year less than the New Democratic Party (NDP)); (4) whether the federal government had promised specific federal funding (during a minority government) or federal funding was not available; and (5) importance of a change of government. The ratio of years in power indicates how long and proportionately how long the governments had available to implement their policies. The impact of ideology was measured for both innovations and organizations, sometimes using the same questions. There were nine ideology statements for innovations, e.g. How ideological were the two governments on these innovations?

*External Support* was measured by: support for the innovation by the political party in power, the governing party’s election platform, and implementation of the innovation by other government(s). *Economy* was measured by economic growth rate, unemployment rate and government debt.

*Resources* were measured by: *financial resources* (balanced/deficit budget, size of provincial debt, existence of windfall revenues, competition with other priorities, funding provided, whether resources were retained over decades); *administrative support* (were innovations small, infrastructure and new positions were funded, the organization had recently changed); *the innovation was fully implemented* (were I&O and staff fully and quickly funded, retained their funding, fully and quickly implemented, how long the government was in power); and *employee support* (whether managers and/or working level employees supported the I&O, personnel were well treated, had to compete for funding with other programs/organizations).

Four *effects* were measured (1) was the program model was efficacious<sup>9</sup> and augment the incomes of the poor; (2) did the innovations reduce poverty, yet respect the public’s desire not to see the system cheated and not attract the poor from other provinces;<sup>10</sup> (3) whether the innovations fulfilled their goals; and (4) whether employees were respectful of clients.

***Instrument and Raters.*** The instrument is published in Glor (2017a, Appendices I-IV). For policy, the innovations’ communities were officials in other (especially other geographically close NDP) provinces, Sask. non-profit organizations, academic supporters and critics, Cabinet and members of the Legislature, and other English-speaking social democratic country officials (e.g. U.K., New Zealand). The government’s community for these innovations was the NDP caucus in the Legislature, members of the NDP and its supporters, elected officials in some other Canadian provinces, the federal NDP caucus in Parliament, the federal government, and progressive American governments. During the mid-1970s, New Jersey; Gary, Iowa; Seattle-

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<sup>9</sup> Kramer (1981, p. 265) identified four characteristic vulnerabilities in nonprofit organizations: formalization or institutionalization, goal deflection, minority rule, and *ineffectuality*.

<sup>10</sup> American literature (Berry and Berry, 2013) has shown this does not occur, but what about in Sask? Not attracting the poor from other jurisdictions was measured by whether there was an increase in the unemployment rate, acted as a disincentive to work, reduced work disincentives, redistributed income, expanded eligibility, kept up with the cost of living, information was available, and changed recently before introduction of the innovation.

Denver; and Dauphin, Manitoba had guaranteed income experiments (Osborne, 1985: 12). The GIE did not support Berry and Berry’s (2013) regional diffusion model, however.

The 1271 I&O statements explored factors judged to potentially have affected the fate of the innovations. The statements in the questionnaires were each measured by each rater on a five-point Likert scale. A higher score indicates that the element being measured was more strongly at work, a score of three is neutral, and a lower score indicates the element was less strongly at work. Three expert raters completed the questionnaires by choosing an assessment for each statement in each time. Both the raters and the instrument were found to be reliable and the instrument was found to be valid (content and construct validity) (Glor, 2017b). Two examples of statements and possibilities for their scoring by I&O are provided below.

Q6: The voting of the citizenry was consistent across provincial and federal elections.

Q121: The innovation had been introduced by another government.

Choices: Strongly Disagree=1, Disagree=2, Neither disagree nor agree=3, Agree=4, Strongly Agree=5.

Factor	Day Care		FIP		SIP		ESP		WCB	
	Time 1 Create	Time 2 Mort/Sv	Time 1 Create	Tm 2 Mort/Sv	Time 1 Create	Tm 2 Mort/Sv	Time 1 Create	Time 2 Mort/Sv	Time 1 Create	Time 2 Mort/Sv
Q 6										
Q 121										

The capacity of factors and possible clusters of factors to predict globally the introduction and fate of I&O are examined in this paper. The external variables (factors) examined are ideology, politics (sub-factors federal-provincial politics, provincial politics), external support and the economy. The internal factors examined are resources (sub-factors financial resources, administrative support, how successfully innovations were implemented, employee support, orders of change required [for organizations] and effects of the innovations (sub-factors innovation efficaciousness, whether goals were accomplished including effect on poverty, respect of clients, unwanted side effects).

## Results

All I&O were assessed using essentially the same statements for the same factors. I&O data were examined separately and together in Glor (2018) and were found to be sufficiently similar that their data could be combined. They are combined here as well. Individual factor data were reviewed then this paper considered whether the factors cluster, to see whether any clusters are good predictors of fate. All data were paired for times 1 and 2, and only data available in both time periods were used, a total of 555 pairs, across ten I&O.

*Descriptions, Statistical Analyses.* In a **first** test, 1267 statements in the instrument were grouped into factors. Whether their scores were the same/ different in times ½ was assessed by descriptive statistics (Table 1). Mean differences of scores for all factors were considered, using two types of tests—*t*-test and paired samples Wilcoxon test (Table 2a). A **second** assessment for similar scores employed a *paired samples t-test*, which determined whether the mean difference between the two sets of observations is zero (whether they are the same). The difference of

means between times 1 and 2 was compared for I&O grouped by survived/ terminated, using pairs of observations. A t-test requires two independent groups (either ordinal or continuous), in this case, two measures, but they need not be normally distributed (can be nonparametric). The t-value measured the size of the difference relative to the variation in the sample data, and found the true difference in the score means of surviving/terminated I&O was not equal to 0, they were significantly different. The score means combine the data for all of the factors.

**Table 1: Descriptive Statistics for Six Factors, All I&O Combined, Times 1 and 2**

	Ideology	Politics	External Support	Economy	Resources	Effects
No. Pairs	57	99	19	40	172	168
Mean Score Tm 1	3.178421	3.134680	3.815789	4.862500	4.267500	3.826190
SD	1.3404128	1.434441	1.1572300	0.3394471	1.0099998	0.7837487
Mean Score Tm 2	4.377193	4.281178	3.157895	1.525000	2.401163	2.458333
SD Tm 2	0.9967837	1.2862110	1.3022697	0.9333562	1.6028479	1.5644025
Mean Difference	1.198772	1.146498	-0.8157895	-3.3375000	-1.8159884	-1.367857
SD	2.019006	1.465650	1.842481	1.117389	2.090442	1.632082

Tm1=Time 1; Tm2=Time 2. Mean Difference calculated by R Commander per statement and summed (555 pairs).

**Table 2a: Paired T-test, Paired Samples Wilcoxon Rank Sum Test for Differences of Means in Times 1 and 2 for All Factors Combined and Survival, Time 2**

Data	Test result	Df	p-value	Alternative hypothesis	95 % confidence	Sample estimates: mean of difference
<b>Paired t-test:</b>						
DifMeanTms and SurvTm2.	T=11.419	554	< 2.2e-16 Significant	True difference in means is not equal to 0	-1.263566 -0.892650	-1.078108
<b>Wilcoxon rank sum test:</b>						
DifMeanTms and SurvTm2	V=27552		< 2.2e-16 Significant	True location shift is not equal to 0		

with(Dataset, (t.test(DifMeanTms, SurvTm2., alternative='two.sided', + conf.level=.95, paired=TRUE)))

T-tests can be problematic for Likert scales, so analysts use a non-parametric test. This *third* test, a *paired samples Wilcoxon rank sum test with continuity correction*, found the scores of the factors as a whole in times 1 and 2 were significantly different (Table 2a). This is because most factor scores behaved similarly in their changes from Time 1 to 2. Next this paper considers whether some of the six factors could be grouped, and how, guided by the following questions.

**Question 1: Are there types of factors? If so, what are they?**

Question 1 explores whether and the ways in which the factors could be grouped. Two different ways to do so are explored:

*Question 1a: Can factors with similar scores, in times 1 and/or 2, be grouped?*

*Question 1b: Are factors related to each other?*

Following the responses to 1a and b, question 2 will explore clusters of three and two factors.

**Question 1a. Can factors with similar scores in times 1 and/or 2 be grouped?**

A *first* way to identify groups of factor scores is to identify, in times 1 and 2, the factors with the *highest and lowest scores by I&O survived/terminated* and determine whether the factors with similar scores are related to each other. In *Time 1*, for I&O that *survived* in Time 2, the highest scored factors (3.999+), in order from highest to lowest, were economy and resources. External support (3.833333) and effects (3.760000) had medium scores. The lowest scored factors were ideology and politics; ideology (2.888889) was not an influence (below neutral, 3.0), politics (3.175614) had a low influence. This is because I&O that survived were pro-business as well as pro-workers, and a policy the Conservatives supported. In Time 1, for I&O that were *terminated* in Time 2, the highest scored factors were the same, economy and resources. The medium scored factors were external support and effects. The lowest scored factors were ideology and politics. The most and least important factors in Time 1 for I&O that survived and were terminated were similar (Table 2b).

**Table 2b: Comparison of Means, Differences in Factor Scores between Times 1 and 2 by Factor and Survived/Terminated**

Factors	Ideology	Politics	External Support	Economy	Resources	Effects
<b>Time 1 Mean of Factors for 2 I&amp;O that Survived in Time 2: WCB</b>						
<i>Mean</i>	2.888889	3.175614	3.833333	4.750000	4.325000	3.760000
<i>Rank</i>	<b>5</b>	<b>4</b>	<b>3</b>	<b>1</b>	<b>2</b>	<b>3</b>
<b>Time 2 Mean of Factors for 2 I&amp;O that Survived in Time 2: 2 WCB</b>						
<i>Mean</i>	3.888889	4.140175	4.000000	2.125000	2.600000	2.578125
<i>Rank</i>	3	1	2	6	4	5
<i>Difference Mean Tm 2 minus Time 1</i>	1.000000	0.964561	0.166667	-2.625	-1.725	-1.181875
<i>Rank of Dif.</i>	4	5	6	1	3	2
<b>Time 1 Mean of Factors for 8 I&amp;O Terminated in Time 2</b>						
<i>Mean</i>	3.234208	3.124958	3.812500	4.890625	4.2609587	3.8417647
<i>Rank</i>	5	4	3	1	2	3
<b>Time 2 Mean of Factors for 8 I&amp;O Terminated in Time 2</b>						
<i>Mean</i>	4.468750	4.314667	3.000000	1.375000	2.369650	2.4301467
<i>Rank</i>	1	2	3	6	5	4
<i>Difference Mean Tm 2 minus Tm 1</i>	1.234542	1.189709	-0.812500	-3.515625	-1.8913087	-1.411618
<i>Rank of Dif.</i>	4	5	6	1	2	3

Note: Database: 46rSurvTermSort2. Tm=Time.

Factors were ranked the same if their mean scores were less than 0.1 different.

In *Time 2*, for I&O that *survived*, highest scores were for politics (4.314667) and external support (4.0). Ideology's score (3.888889) was slightly less, a high medium score. In *Time 2*, for I&O that were *terminated*, the highest scores were for ideology (4.468750) and politics (4.314667). External support (3.0) was neutral. The lowest scored factors were economy (1.375000), resources (2.369650), and effects (2.4301467). The highest ranked factors were similar for I&O that survived and were terminated but their scores changed considerably. The most important factors reversed between times 1 and 2 but within *Time 1* and *Time 2*, the scores were similar. Ideology and politics changed from least to most important factors. There were no medium scores for I&O that were terminated (Table 2b). In *Time 1*, economy, resources, external support and effects had high (3.999+) and medium (3.4999-3.999) scores and were most important; in *Time 2*, ideology and politics were the most important factors.

A *second* approach to question 1a is to consider the *changes* in the individual factor scores from *Time 1* to *Time 2* (Table 2b). In *Time 1*, both for I&O that survived and were terminated, ideology and politics had similar scores, as they also did in *Time 2*. Important *Time 2* factors all related to political factors (ideology, politics). As in studies of innovation adoption, ideology and politics were not important in *Time 1* but they were very important in *Time 2*. While scores for ideology and politics were high, their high scores did not support survival of I&O. Resources and effects had similar scores (-1.999-2.4999) as well and did not support survival either. Economy had an even lower score (<1.999). Both factor groups' scores changed considerably from *Time 1* to *Time 2*. Economy and resources/effects all had negative scores.

A *third* way to consider factors individually is to consider the *biggest and smallest changes*. Biggest changes were for terminated I&O and included declines in the scores for economy, resources, effects and external support. Only two factors increased their scores, ideology and politics. Glor (2018) confirmed the finding in the dissemination literature that ideology and politics were not important in introduction of innovations, but found that they were very important in this first study of survival/termination of I&O. In *Time 1*, I&O that *survived* in *Time 2* had similar scores for ideology and politics (close to 3.0, neutral), external support and effects (3.5 to 3.9) and economy and resources (4.0+). The *Time 1* scores for I&O that were *terminated* in *Time 2* had similar scores for the same factors. *Time 2* factor scores for I&O that *survived* were similar on the high end for ideology, politics and external support and on the low end for resources and effects. The *Time 2* factor scores for *terminated* I&O were similar for ideology and politics (4.0+) and resources and effects (2.0-2.9). These factor groups scored similarly in *Time 1* and differently in *Time 2*.

A *fourth* way considers factors separately in times 1 and 2 for I&O that *survived/terminated as groups*, to see *how much the scores changed and whether the scores were the same or different in the two times* (Table 2b). The biggest *factor score change* from times 1 to 2 for I&O that *survived* was in the score for economy (change of -2.625 of 4 possible) and resources (change of -1.725). The factor with the least change was external support, with a mean change of 0.166667. Three factors changed close to one point: effects, ideology and politics. One Likert point, a 25 per cent change, is considered an important difference. For the I&O that survived from times 1 to 2, three factors became less of an influence (changed in a negative direction), economy, resources and effects, and three factors became a stronger influence (their scores changed in a positive direction), ideology, politics and external support. For I&O

terminated in Time 2, economy declined the most (-3.515625), followed by resources (-1.8913087), effects (-1.411618), and external support (-0.812500) (a cluster called “support”). The GoS’s financial position and its support for these I&O had declined considerably before they were terminated. Decision-taking based on ideology (1.234542) and politics (1.189709) had increased considerably.

A *fifth* approach identifies factors experiencing *similar levels of change*. Table 2c calculates differences of scores for each factor for Time 1, Time 2 and ranks the differences. In *Time 1*, the factor scores for I&O that eventually survived/terminated were very similar. None of the differences was substantial. In *Time 2*, the differences in scores between I&O that survived and terminated were larger e.g. ideology increased substantially to 0.579861, but this was not a large difference. Ideology scores were consistent across survived/terminated I&O within times 1 and 2. What changed substantially was the scores between times 1 and 2 (Table 2b): ideology and politics had much higher scores in Time 2, especially for terminated I&O. This suggests the most important factor in Time 2 was the beliefs of the government in power. In this case, the GoS in Time 1 was not highly ideological while in Time 2 it was. To attempt to confirm this, the differences in scores for times 1 and 2 were considered. The changes in the scores between times 1 and 2 were all high except for external support and, just barely, politics for I&O that survived. For I&O that survived, changes were largest for economy, effects and resources. These three factors were connected: economy to some extent determined the government’s revenues, which in turn determined resources; resources determined effects of I&O.

**Table 2c: Comparison of Means in Times 1 and 2 for I&O that Survived/Terminated in Time 2, Differences of Means, Ranking of Differences of Means**

Factors	Ideology	Politics	External Support	Economy	Resources	Effects
<b>Time 1: Survived Time 2 WCB</b>						
<i>Mean</i>	2.888889	3.175614	3.833333	4.750000	4.325000	3.760000
<i>Rank</i>	5	4	3	1	2	3
<b>Time 1: Time 1 Mean of 4 I&amp;O Terminated in Time 2</b>						
<i>Mean</i>	3.2342085	3.124958	3.812500	4.890625	4.2609587	3.8417647
<i>Rank</i>	4	5	3	1	2	3
<i>Difference of Means</i>	0.3453195	-0.050656	-0.020833	0.140625	-0.0640413	-0.0817647
<i>Rank of Difference</i>	1	5	6	2	4	3
<b>Time 2: Survived Time 2: 2 WCB</b>						
<i>Mean</i>	3.888889	4.140175	4.000000	2.125000	2.600000	2.578125
<i>Rank</i>	3	1	2	6	4	5
<b>Time 2: Terminated Time 2: 7 I&amp;O</b>						
<i>Mean</i>	4.468750	4.314667	3.000000	1.375000	2.369650	2.4301467
<i>Rank</i>	1	2	3	6	5	4
<i>Difference of Means</i>	0.579861	0.174492	-1.0	-0.75	-0.23035	-0.1479783
<i>Rank of Difference</i>	3	5	1	2	4	6

Note: Factors were ranked the same if their mean scores were less than 0.1 different

For terminated I&O, the differences in scores between times 1 and 2 were consistently larger than they were for I&O that survived. Termination could be recognized in the numbers. Scores for economy, resources and effects went down and all scores for ideology and politics

went up. Only external support changed in different directions: it went up a little for I&O that survived and down substantially for I&O terminated. A small change is .1 to .4, substantial .5 - .998, large .999 to 1.999 and major 2.0 and above. Economy experienced a major change; the other factors—resources, effects, ideology and politics—experienced large changes.

The groups of factors experiencing similar score changes were (1) resources and effects (down) and (2) ideology and politics (up). External support and economy did not experience changes of a similar magnitude to any other factors. Four factors could be grouped: Type 1- ideology and politics and Type 3-resources and effects

A *sixth* way to calculate similar factor scores is to use regression lines and coefficients to compare the factors to each other according to the ranks of their coefficients. There are some possible problems in using regression coefficients, including differences in numbers of pairs for factors, too little data and too little homogeneity/too much heterogeneity in the data. Glor (2018, Appendix II) addressed these potential problems and demonstrated that the logistic regression can be used to rank the importance of the factors. Table 3 ranks the factors by logistic regression coefficient to predict survival of I&O in Time 2, taking account of the number of pairs. Because the number of pairs (Table 1) was different for different factors, this impact was checked but not found to be important. The coefficients are negative because eight of ten I&O were terminated. Among the six factors, the factors causing the least change in the prediction in Time 2 are economy and politics, in that order. The difference of the score for resources from effects (the intercept) is significant at the 0.05 level, so it is a significant effect. The factors with the most similar regression coefficients in Time 2 were external support, ideology and politics. The regression analysis did not, however, add much to the existing understanding of how to group the factors. Resources and effects (the intercept) were closest in coefficients, as were ideology, external support and politics. Economy was in a category by itself.

**Table 3: Ranking of Logistic Regression Coefficients (GLM) for Factors Influencing Survival in Time 2, Innovations and Organizations, from Highest to Lowest Coefficient**

	Factor	Coefficients Ranked	Standard Error	Z value	Pr(> z )
	Intercept	-1.27450	0.47488	-2.684	0.00728 **
<b>Highest</b>	Economy	-0.05405	0.46193	-0.117	0.90684
	Politics	-0.17986	0.36302	-0.495	0.62028
	External Support	-0.38645	0.65919	-0.586	0.55770
	Ideology	-0.41724	0.44795	-0.931	0.35162
<b>Lowest</b>	Resources	-0.72067	0.30696	-2.348	0.01889 *
	MeanTm2	0.01634	0.08098	0.202	0.84007
	MeanTm1	-0.01702	0.11032	-0.154	0.87738
	No. pairs	NA	NA	NA	NA

Effects were the intercept to which the other factors were compared. Used means Time 1, 2.  
Significance codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1

Question 1a, similarity of scores for purposes of grouping factors, was tested six ways: (1) For Factors with the highest and lowest scores by I&O survived/terminated, determining whether the factors with similar scores are related to each other; (2) Changes in individual factor



scores from Time 1 to 2; (3) Biggest and smallest changes; (4) I&O that survived/ terminated as groups, to see how much the scores changed and whether the scores were the same or different in the two times; (5) Identifying factors experiencing similar levels of change; and (6) Similar regression coefficients across time periods. Each revealed different aspects of similarity. Conceptually, (6) would be best but it is not very useful in this context.

**Question 1b. Are factors related to each other?**

Can factors addressing seemingly related topics be grouped into clusters, i.e.: (1) politics and ideology, (2) economy and external support, and (3) resources and effects? Table 4 analyzes these groups of related factors. They are External, Type 1 (politics and ideology), External, Type 2 (economy and external support), and Internal, Type 3 (resources, effects). Types 1 and 3 factors appear to be related within their categories as their scores are similar in both times 1 and 2, they move in the same direction, in similar amounts. The links within Type 2 factors are less clear. Both decline from times 1 to 2, so they move in the same direction, but economy moves more and becomes a negative factor while external support moves less and remains a slightly positive factor. It would appear that economy could possibly support Type 3 resources, external support Type 1. Perhaps there are no Type 2 factors, but rather, economy and external factors should be considered by themselves or perhaps combined with different types. There are additional ways these factors could be combined that are explored in question 2.

**Table 4: Comparison of Means for External and Internal Factors, Times 1 and 2**

	Time 1		Time 2		pairs	n
	mean	sd	mean	sd		
<b>External Factors (Type 1):</b>						
<i>Ideology</i>	3.178421	1.3404128	4.377193	0.9967837		57
<i>Politics</i>	3.134680	1.4344406	4.281178	1.2862110		99
<b>Mean</b>	<b>3.156551</b>		<b>4.329186</b>			
<b>External Factors (Type 2):</b>						
<i>Economy</i>	4.862500	0.3394471	1.525000	0.9333562		40
<i>Extsupport</i>	3.815789	1.1572300	3.157895	1.3022697		19
<b>Mean</b>	<b>4.339145</b>		<b>2.3414475</b>			
<b>Mean</b>						
<b>External</b>	<b>3.7478475</b>		<b>3.3353165</b>			<b>215</b>
<b>Internal Factors (Type 3):</b>						
<i>Resources</i>	4.267500	1.0099998	2.401163	1.6028479		172
<i>Effects</i>	3.826190	0.7837487	2.458333	1.5644025		168
<b>Mean</b>	<b>4.046845</b>		<b>2.429748</b>			<b>340</b>

**Question 2: Are there clusters? If so, which ones?**

As indicated under Question 1, some of the factors have similar scores and move in similar directions (up/down together). Question 2 addresses whether these types of factors can be clustered to predict I&O fate. A cluster is a group of related factors.

**Question 2a: Are there three clusters? If so, which ones?**

When the instrument was constructed, it was thought that there would be three types of

factors. These three possible clusters are identified in Table 4. In an attempt to confirm these three types of factors exist and that there are statistically significant differences between their means, three one-way analyses of variance (ANOVA) of the three types of clusters were conducted, comparing (1) the difference of their means between times 1 and 2, (2) their means in Time 1, and (3) their means in Time 2 (Table 5). All three ANOVA produced significant results at the .01 level (Table 5). The three clusters distinguish the factors influencing I&O at times 1 and 2, at the .001 significance level. These three clusters can therefore be considered to have more/less influence on the fate of I&O and to be more/less important in influencing the introduction in Time 1 and the fate in Time 2 of these I&O. A different paper will consider whether the factors accurately predicted survival/termination of individual I&O. This one considers survival/termination as categories of fate.

High scores for Type 2 (economy, external support) and Type 3 (resources, effects) factors (clusters) supported introduction. The change from fairly neutral Type 1 cluster (ideology, politics) scores in Time 1 to high scores in Time 2 did not support retention of I&O—the highest scores for ideology and politics were negative indicators for the survival of I&O. Only two types of factors appear to exist (Type 1, 3), in times 1 and 2, because of the dissimilarity of external support and economy scores within Type 2 cluster in both Time 1 and 2.

**Table 5: Analysis of Variance (ANOVA) of Difference of Means, Mean Times 1 and 2**

Variable	Mean	SD	N	Df	Sum Sq	Mean Sq	F value	Pr(>F)
<b><i>Difference of Means:</i></b>								
Type 1	0.9858974	1.683329	156					
Type 2	-2.525424	1.818070	59					
Type 3	-1.4945588	1.903313	340					
Total			555					
<b><i>ANOVA:</i></b>								
X3 Factor				2	830.9	415.4	123.4	<2e-16 ***
Residuals				552	1859.0	3.4		
<b><i>Mean Time 1:</i></b>								
Type 1	3.150662	1.3966123	156					
Type 2	4.525424	0.8581442	59					
Type 3	4.049441	0.9305858	340					
<b><i>ANOVA:</i></b>								
X3 Factor				1	116.7	58.37	50.45	<2e-16 ***
Residuals				552	638.6	1.16		
<b><i>Mean Time 2</i></b>								
Type 1	4.316261	1.186208	156					
Type 2	2.050847	.305476	59					
Type 3	2.429412	1.581890	340					
<b><i>ANOVA:</i></b>								
X3Factor				2	430.5	215.26	102	<2e-16 ***
Residuals				552	1165.3	2.11		

Type 1= ideology, politics; Type 2=economy and external support; Type 3= resources and effects.

Significance codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1

The next sections consider possible combinations of *two* clusters, in several ways:  
 Question 2b: Are there external and internal clusters?  
 Question 2c: Is there a resource-related (economy + Type 3) cluster? Are political (Type 1) and resource clusters different from each other?  
 Question 2d: Are there power (ideology, politics, external support) and support (economy, resources, effects) clusters?

**Question 2b: Are there external and internal clusters?**

Two articles in the literature found external and internal factors, as did this one. Do they distinguish fate well? Question 2b compares four types of external factors to the two types of internal factors (Types 1+2 vs Type 3) in this study. External factors are Type 1 (ideology, politics) and Type 2 (economy, external support); internal factors are Type 3 (resources, effects).

*First*, the Type 3 (internal) and the Type 1 and 2 (thought to be two types of external factors) were considered. In Time 1, the mean of the means for the four external factors is 3.7478475; of the internal factors is 4.046845, a difference of 0.2989975 or 8 per cent of the mean for the external factors. The scores of the internal factors are slightly higher than those of the external factors in Time 1. In Time 2, the mean of the means for external factors is 3.3353165 and for internal factors is 2.429748, a difference of 0.9055685 or 27.15 per cent of the mean of the mean for the external factors. The mean of the means for the two types of external factors declines in Time 2 but is still a positive influence for survival. The mean of the means is lower for internal factors in Time 2 and is a negative factor for survival (Table 6a). Internal factors show a substantial decline in their means, external factors show a smaller decline. This is because some the scores for some external factors decrease while others increase in Time 2. The mélange of positive and negative external scores is not very informative: *Type 1 and 2 factors should be considered separately.*

**Table 6a: Comparison of Mean Scores for Internal and External Factors**

	<b>Mean of All Four External Factors (Types 1, 2)</b>	<b>Mean of Two Internal Factors (Type 3)</b>
<b>Time 1</b>	3.7478475	4.046845
<b>Time 2</b>	3.3353165	2.429748
<b>Difference Tm 2 –Tm 1</b>	0.412531	-1.997697

Number of pairs=550

The means of a variety of two factors are presented in Table 6b. A comparison of sums of types is also presented. Type 1 and 2 external data score quite differently and move in different directions. Treating them as one group (adding their scores) seems to obscure differences rather than reveal them. They seem to be different types of factors, not similar ones, as originally thought. Type 2 and 3 factors score somewhat similarly (within 0.48 of each other) in times 1 and 2, and appear to be somewhat related groups of factors. This will be explored further in Question 2c. *The external-internal distinction is not helpful.*

**Table 6b: Means of Factors and Combinations of Factors**

	<b>Time 1</b>	<b>Time 2</b>	<b>Difference Tm2 –Tm 1</b>
<b>Mean Type 1 External Cluster (Political)</b>	3.1506620	4.3162610	1.165599
<b>Mean Type 2 External Cluster</b>	4.5254240	2.050847	-2.474577
<b>Mean Type 3 Cluster (Internal)</b>	4.0494410	2.429412	-1.997697
<b>Mean Type 1+2 (External)</b>	3.7478475	3.3353165	-0.412531
<b>Mean Type 2+3 Factors (Support)</b>	4.1198250	2.373434	-1.746391

N of pairs=555. Type 1 factors=ideology, politics; Type 2 factors=external support, economy; Type 3 factors=resources, effects.

There do appear to be two types of factors; however, they may be political factors and support factors, not external and internal factors. This is explored further in questions 2c.

***Question 2c: Is there a Type 2 +3 cluster? Are political (Type 1) and Type 2 + 3 clusters different from each other?***

Question 2c addresses whether there is a Type 2 + 3) cluster or types 2 and 3 are different. This analysis combines the factors differently from Question 2b. Here, Type 2 data is explored for how much it has in common with Type 3 data, based on the argument that they are both important in determining the resources available for I&O. Types 2 and 3 clusters are compared to see if they are similar enough that they could be combined to produce a new resource cluster. The analysis combines Type 2 (external) factors with Type 3 (internal) to include economy, external support, resources, and effects; it is compared to the political external factors (ideology, politics). It explores whether Type 2 and 3 factors are the external and internal clusters relating to resources. They have similar means in times 1 and 2, and move in similar directions: type 2 and 3 factors have high scores in Time 1 and low scores in Time 2; they both move downwards. On the other hand, Type 1 political factors have fairly neutral scores in Time 1 and high scores in Time 2; they move upwards.

Two tests were conducted to determine whether types 2 and 3 are the same and can be clustered or different. One test checked whether type 2 and 3 factor means were similar and somewhat equivalent. It examined the means three ways with one-way ANOVA tests. Summaries of the data revealed what looked like a difference in the difference of means (1.0308681) between times 1 and 2 but modest differences within times 1 and 2 (Table 6c). Nonetheless, they are successfully detecting changes. The differences in the means between times 1 and 2 were not very different (<0.5). They are quite similar.

In Time 1, the mean of scores for Type 2 external factors (economy, external support) is very high (mean 4.525424). The mean of scores for Type 3 internal factors (resources, effects) is also very high (4.046845). The mean of the means for the same factors in Time 2 is 2.050847 and 2.429748, respectively. Their standard deviations are similar in Time 1 but not in Time 2.

**Table 6c: Numerical Summaries of Type 2 and 3 Clusters: Difference of Means and Means, Times 1 and 2**

Variable	Mean	SD	IQR	N	Df	Sum Sq	Mean Sq	F value	Pr(>F)
<b>Difference of Means</b>									
Type 2	-2.525424	1.818070	2.25	59					
Type 3	-1.494559	1.903313	3.00	340					
Total N				399					
Difference	1.0308681								
<b>ANOVA:</b>									
X2 Factor					1	53.4	53.43	14.94	0.00013 ***
Residuals					397	1419.8	3.58		
<b>Mean Time 1</b>									
Type 2	4.525424	0.8581442	1.0	59					
Type 3	4.049441	0.9305858	1.5	340					
Difference	0.475983								
<b>ANOVA:</b>									
X2 Factor					1	11.4	11.390	13.45	0.000279 ***
Residuals					397	336.3	0.847		
<b>Mean Time 2</b>									
Type 2	2.050847	0.305476	2	59					
Type 3	2.429412	1.581890	3	340					
Difference	-0.378565								
<b>ANOVA:</b>									
X2Factor					1	7.2	7.205	3.02	0.083 .
Residuals					397	947.2	2.386		

Type 2 includes economy and external support; Type 3 includes resources and effects.

Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1

```
> numSummary(Dataset_types_1_and_3[,c("DifMeanTms", "MeanTm1.", "MeanTm2."),
+ drop=FALSE], groups=Dataset_types_1_and_3$X2Factor, statistics=c("mean",
+ "sd", "IQR"), quantiles=c(0,.25,.5,.75,1))
> Dataset <- readXL("C:/Users/Public/Glor_46t_2_factors Type 1 3.xlsx",
+ rownames=FALSE, header=TRUE, na="", sheet="All", stringsAsFactors=TRUE)
```

Three one-way ANOVA were conducted (Table 6c) to explore the differences further, testing the non-specific null hypothesis that the three means are statistically *the same*. When the null hypothesis is rejected, the conclusion is that at least one population mean is different from at least one other mean. The differences of means and means in Time 1 were statistically different; means in Time 2 were not statistically different, although 0.08 is fairly close to 0.05, defined as significance. In summary, the Type 2 and 3 data measured different on two measures and close to different on the third. *They could not, therefore, be combined*. The Type 2 external factors are not measuring close enough to the same thing as the Type 3 internal measures. They are different: though directions are similar, amounts are not. Despite the means of types 2 and 3 factors not being the same, they may both be measuring a third thing, here called resources.

**Table 6d: Comparison of Political (Type 1) and Resource (Types 2 and 3 Combined) Factors by Difference of Means, Means Times 1 and 2**

Variable	Mean	N	Df	Sum Sq	Mean Sq	F value	Pr(>F)
<b>Difference of Means</b>							
Type 1	0.9858974	399					
Type 2+3	-1.6469925	156					
Total N		555					
<b>ANOVA:</b>							
X2 Factor			1	777.4	777.4	224.8	<2e-16 ***
Residuals			553	1912.4	3.5		
<b>Mean Time 1</b>							
Type 1	3.150662						
Type 2+3 Resources	4.119825						
Dif	0.969163						
<b>ANOVA:</b>							
X2 Factor			1	105.3	105.34	89.62	<2e-16 ***
Residuals			553	650.0	1.18		
<b>Mean Time 2</b>							
Type 1	4.316261						
Type 2+3 Resources	2.373434						
Dif	-1.942827						
<b>ANOVA:</b>							
X2Factor			1	423.3	423.3	199.7	<2e-16 ***
Residuals			553	1172.5	2.1		

Type 2 includes economy and external support; Type 3 includes resources and effects.

Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1

Excel file: Glor\_46t\_factors\_2\_types.xlsx"

```
> AnovaModel.4 <- aov(DifMeanTms ~ X2Factors, data=Factors_1_3_and_2)
```

```
> with(Factors_1_3_and_2, numSummary(DifMeanTms, groups=X2Factors,
+ statistics=c("mean", "sd")))
```

```
> AnovaModel.5 <- aov(MeanTm1. ~ X2Factors, data=Factors_1_3_and_2)
```

```
> summary(AnovaModel.5)
```

```
> with(Factors_1_3_and_2, numSummary(MeanTm1., groups=X2Factors,
+ statistics=c("mean", "sd")))
```

```
> AnovaModel.6 <- aov(MeanTm2. ~ X2Factors, data=Factors_1_3_and_2)
```

*Are Type 1 and Type resource clusters different from each other?* Comparing the data for the resource to the political cluster (Table 6d), the scores for political factors seem different from the resource factors, in both Time 1 and Time 2, differences of 0.9848974 and above. Resource factors declined in Time 2 but Type 1 factors increased. This suggests that resource and political factors are important, and should be considered separately. It also suggests that resource factors, while perhaps not equivalent to each other, are measuring some similar issues. This is checked by comparing them using one-way ANOVA, to see whether their means were the same.

Three one-way ANOVA tests compared the political and Type 2+3 clusters, using all 555 pairs. The ANOVA test compared differences of means and means of types 1 and 2 factors in times 1 and 2, testing the null hypothesis that the means were the same. All results were

significant at the zero level: difference of means between times 1 and 2 and the means in Time 1 and Time 2 for political and Type 2+3 factors were not the same. Problems are found with this approach later, however.

*Summary of Findings, Question 2c:* Type 1 and 2 external factors moved in opposite directions. Type 1 external factors (ideology, politics) scored neutral in Time 1 and high in Time 2, Type 2 external factors (external support, economy) and Type 3 (resources, effects) (internal), clusters scored high in Time 1 and low in Time 2. *Types 2 and 3 factors behaved similarly, but were distinguishable.*

Type 1 factors moved in an opposite direction to Type 2+3. A strong political response in the absence of a strong economy, combined with reduced external support, resources and effects could be an irrational response (a response dominated by politics and ideology) to a difficult situation. Possible reasons are discussed in Glor (2018).

- Type 2 external factors, together, declined from a mean of means of 4.3391445 to 2.3414475, a change of -1.997697. This is similar to the two measures of Type 3 (internal) factors declining from 4.046845 to 2.429748, a decrease of -1.617097 (using a mean of means treats the two factors as if they were equally important). Type 2 and 3 factors might be linked.
- Type 2 cluster (economy, external support) declined from Time 1 to 2, but the mean for external support remained slightly positive in Time 2, unlike internal cluster.
- Type 2 and 3 factors declined while Type 1 factors increased: using a mean for external factors muddied the impacts.
- This is caused by the unique behaviour of external support in Time 2: it goes up for I&O that survived and down for I&O that terminated. Because of this, external support and economy (Type 2) cannot be clustered.
- The mean of means of Type 1 cluster (ideology and politics) increased from a low of 3.1565505 in Time 1 to a high of 4.3291855 in Time 2, a change of +1.172635.<sup>11</sup> Nonetheless, they changed the least. They were also the only cluster that increased (however, external support for I&O that survived also increased).
- The consistent clusters were political (Type 1) and “support” cluster (economy + Type 3): the directions they move in Time 2 are consistent: political up, support down.
- The results of this analysis also differentiate factors whose scores moved up in Time 2 (politics, ideology) from those that moved down (economy, resources, effects).

While all factors score consistently in Time 1, external support does not in Time 2, scoring differently for I&O that survived/terminated. Factor scores are separated for I&O that survived/terminated and are examined separately in Question 2c. It is particularly important to separate the factors this way if an attempt is made to predict which I&O will survive/ terminate.

***Question 2d: Are there power (ideology, politics, external support) and support (economy, resources, effects) clusters?***

This analysis compares the scores in times 1 and 2 for two clusters that have somewhat similar scores: power cluster (ideology, politics, external support) and support cluster (economy,

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<sup>11</sup> An argument could perhaps be made for including a number of the external support statements in the category of ideology and/or politics. This issue is not explored here.

resources, effects), by survived and terminated I&O (Table 7a). The elements of the political cluster (ideology, politics) scored similarly in *Time 1*, although ideology showed some, low difference between I&O that later survived/terminated (0.345396). In *Time 1*, political cluster scored much lower than the support cluster. Politics scored slightly above neutral (3.0), ideology slightly below. *External support* factor scored substantially high in *Time 1*: It did not score similarly to political cluster. The *support* cluster in *Time 1* scored high and the factors quite similarly to each other for all three factors. Scores for I&O that survived/terminated in *Time 2* were also similar.

In *Time 2* the support scores were considerably lower (below 3.0) and became negative influences for survival. One score—economy for terminated I&O—was remarkably lower (difference of -3.515625). For support factors, in *Time 1*, each of the factors scored similarly for I&O that later survived/terminated. In *Time 2*, the scores declined considerably but were still quite similar for I&O that survived/terminated. Political cluster increased a lot, especially for terminated I&O.

**Table 7a: Comparison of Support and Power Clusters**

	Time 1			Time 2			Dif Tm2-Tm1	
	Survived	Terminated	Dif Mean	Survived	Terminated	Dif	Survived (across)	Terminated (across)
<b>Support Cluster:</b>								
<i>Resources</i>	4.325000	4.260959	0.064041	2.600000	2.369650	-0.230350	-1.725000	-1.891309
<i>Effects</i>	3.760000	3.812500	0.052500	2.578125	2.4301467	-0.147983	-1.181875	-1.411618
<i>Economy</i>	4.750000	4.890625	0.140625	2.125000	1.375000	-0.750000	-2.625000	-3.515625
<i>Total</i>	12.835000	12.964083		7.303125	6.1747967	-1.128333	5.531875	6.818552
<i>Mean</i>	4.278333	4.321361	-.043028	2.434375	2.0582655	0.376111	-1.843958	-2.2728506
<b>Political Cluster:</b>								
<i>Politics</i>	3.175614	3.124958	-.050656	3.124958	4.314667	1.189709	.964561	1.189709
<i>Ideology</i>	2.888889	3.234209	-.345396	3.888889	4.468750	0.579861	1.000000	1.234542
<i>Total</i>	6.064503	6.359167	-0.29474	7.013847	8.783417	1.769570	1.964561	2.424251
<i>Mean</i>	3.032252	3.179584	-0.14737	3.506924	4.391709	0.884785	.677480	1.212125
<i>Dif Mean</i>	-1.246082	-1.141778						
<b>Power Cluster (Political Cluster + External Support):</b>								
<i>ExtS</i>	3.833333	3.841765	0.008432	4.000000	3.000000	-1.000000	.166667	-.8125
<i>Total</i>	9.897836	10.20093		11.01384	11.783417	2.76957		
<i>Mean</i>	3.299279	3.400310		3.671282	3.9278056	0.92319	.372003	.5274956
<i>Dif Mean</i>	-0.979055	-0.921051	0.058004	-1.236907	1.8695401			

*External support* did not behave like a political factor. In *Time 2*, the ideology and politics scores were higher for terminated I&O than ones that survived, thus behaving oppositely from external support, which went up for survived I&O, and had the highest score. It went down for terminated I&O, and had the lowest score. *External support thus behaved uniquely and could not be grouped with either power or internal factors*. On the other hand, *economy could be grouped with support factors*. External support did not become a negative factor but it was no longer a positive factor for terminated I&O; it became an even more positive factor for I&O that survived. In *Time 2*, survived I&O had lower scores for politics and higher scores for external



support than I&O that were terminated. Politics and ideology were very high for terminated I&O. External support is an anomaly in that it was quite a positive factor in three of the four contexts, but neutral for I&O that were terminated in Time 2. In other words, it moved in two different directions in Time 2: for survived I&O it went up; for terminated ones it declined to a neutral factor. Politics increased from a slightly positive factor in Time 1 to a very positive factor for both survival and termination (higher for termination) in Time 2. Ideology increased from not being a consideration in Time 1 (score under 3.0) to being a consideration for survived I&O and a major consideration for terminated I&O in Time 2. Type 1 cluster cannot be combined with external support as it masks big changes in both Type 1 factors and external support (Table 7a).

Question 2 considered combinations of three and two clusters that did not predict fate effectively. Question 3 considers a combination of two clusters and a factor that predict better.

**Question 3: Can political and support cluster and external support factor predict global (survival/termination) I&O fate?**

This question attempts to predict whether I&O fate could be predicted globally as survive/terminate using political and support clusters and external support factor. It does not attempt to predict the fate of individual I&O.

Means for external support are compared to political and support means for times 1 and 2, survived and terminated I&O, in Table 7b. Compared to support, external support scored lower in time 1 and higher in Time 2. Compared to the political cluster, external support scored higher in Time 1 for survived I&O in Time 2 and lower in Time 2 for terminated I&O. Differences are large and therefore external support is a good indicator. External support is revealed as an important, self-standing factor in the fate of I&O, in keeping with the expected directions. Political support clusters and external support factor predicted fate of I&O. Table 7c demonstrates the three predictors, when time and fate are ignored, are similar in means and standard deviations though not in numbers of pairs.

**Table 7b: Comparison of Political and Support Clusters, External Support Factor**

I&O:	Time 1			Time 2			Dif Tm2-Tm1	
	<i>Survived</i>	<i>Termd</i>	<i>Dif Mean</i>	<i>Survived</i>	<i>Termd</i>	<i>Dif</i>	<i>Survd (across)</i>	<i>Termd (across)</i>
<b>Political Cluster:</b>								
<i>Mean</i>	3.032252	3.179584	-0.14737	3.506924	4.391709	0.884785	.677480	1.212125
<b>Support Cluster (external support, resources, effects):</b>								
<i>Mean</i>	4.278333	4.321361	-.043028	2.434375	2.058266	0.376111	-1.843958	-2.2728506
<i>Dif Mean</i>	-1.246082	-1.141778						
<b>External Support:</b>								
<i>ExtS</i>	3.833330	3.841765	0.008432	4.000000	3.000000	-1.000000	.166667	-.8125
<i>Mean</i>	3.299279	3.400310		3.671282		0.92319	.372003	.5274956
<i>Dif Mean fr. Political Mean</i>	0.801048	-0.479596		0.493076	-1.391709			
<i>Dif Mean fr. Support Mean</i>	-0.979054	-0.921051		1.565625	0.941734			

**Table 7c: ANOVA Comparison of Political, External Support, and Support Factors, Times 1 and 2 and Fate Combined**

Type of Factor:	Mean	SD	Data:N
Type 1 Political	0.1794872	0.3849957	156
External Support	0.1578947	0.3746343	19
Type 3 Support	0.1684211	0.3747332	380

## Discussion and Conclusion

A series of papers is attempting to answer two questions: What happens to I&O? Why? A previous paper (Glor, 2018b) identified six factors influencing the fate of ten income security I&O. This paper explored whether and how the factors could be clustered. If I&O fate could have been predicted globally (survival/termination), then the fate of individual and other I&O are perhaps also predictable. Of particular interest to future studies of innovations of the GoS, 1971-82 is whether external factors, alone, predict fate, as the external environment for all I&O has now been largely determined. The instrument developed to study these I&O was able to distinguish the factors, clusters, and their influence on I&O in Time 1 and 2. Initially the factors were organized into three clusters: Type 1 external (ideology, politics), Type 2 external (economy, external support), and Type 3 internal (resources, effects). The analysis in this paper showed that while types 1 and 3 clustered, Type 2 did not. This paper therefore combined the six factors in new ways. Analysis revealed there were three types of factors (clusters)—types 1, 2 and 3 but the clusters that behaved most similarly and were therefore best for predicting fate were political cluster (Type 1), support cluster (economy + Type 3) and external support factor. Type 1 cluster was neutral in Time 1 and high in Time 2; support cluster was high in Time 1 and low in Time 2; external support was high for I&O that survived and neutral for I&O that terminated in Time 2. Between Time 1 and 2, the factors and clusters influencing I&O fate most changed completely, from external support and support cluster to political cluster (and external support for surviving I&O).

While analysis confirmed two types of external factors: Type 1, ideology and politics and Type 2, economy and external support, they did not predict fate in Time 2 well. Time 1 scores confirmed the finding in the innovation dissemination literature that ideology and politics were not important in the introduction of innovations, but discovered in this first study of the fate of I&O that *ideology and politics were very important in survival/termination*. While Type 1 cluster was neutral in Time 1 (mean 3.1506620, Table 6b), in Time 2, it scored very high (mean 4.706667 of 5 possible). Analysis by fate in Time 2 found that Type 2 factors (external support, economy) did not behave consistently. Economy was consistent with Type 3 factors but external support factor was not consistent with any other cluster. It was, nonetheless, helpful in predicting the survival/termination of I&O. The best clusters for prediction of global survival/termination were political cluster, external support factor (by itself) and support cluster. Responses to the questions are summarized in Table 11 and in more detail in Appendix I.

**Table 11: Responses to Questions**

No.	Question	Response	If so, which three?
1	<i>Are there types of factors? If so, what are they?</i>	Yes	Factors are ideology, politics, external support, economy, resources, effects.
2	<i>Are there clusters of factors? If so, which ones?</i>	Yes	While Type 1, 2 and 3 clusters were confirmed overall, best clusters for prediction of fate were different: external support behaved uniquely and could not be clustered with either political or resource or internal resource clusters.
3	<i>Can political and support cluster and external support factor predict global (survival/termination) I&amp;O fate?</i>	Yes	External support was an important, self-standing factor in the fate of I&O, in keeping with the expected directions. Political cluster, external support factor, and support cluster successfully and best predicted survival/termination.

Whether Types 1 and 2 factors could be used by themselves to predict the fate of I&O was explored. Despite findings in the literature that external and internal clusters were predictive of introduction of I&O, they were not predictive of fate as a whole in Time 2. It was not possible to predict fate (survival/termination) of I&O in Time 2 on the basis of their type 1 and 2 (external) factor scores alone. Types of factors influencing the fate of I&O did not therefore group as expected. The major changes in Time 2 were increases in the influence of political (Type 1 [ideology, politics]) factors for both terminated and surviving I&O and major declines in economy, I&O resources and effects; an increase in external support for I&O that survived and a major decline to neutral in external support for I&O terminated. *These are new findings.* The GoS had become much more political and ideological in Time 2 than it had been in Time 1. A political transition to extreme neoliberal was detected by the instrument and analyses.

**Implications.** Case studies are very useful in developing theory (Strauss and Corbin, 1998). The current research suggested *factors* most important to introduction of these ten income security I&O included economy, external support, resources and effects; factors influencing termination included politics and ideology, while those influencing survival included politics, ideology and external support. Several other studies found economy was not important to introduction of I&O, but it was in Sask. The NDP government maintained a balanced budget and linked its taxes on resources to the market, easing taxation when the market was poor and taxing more heavily when it was good and companies were highly profitable (Burton, 1997). Glor's (2014a, b) and Glor and Rivera's (2015) approach had not been tested empirically previously, but was tested successfully here. Other researchers could compare their studies to this one and to the mortality rates established for normal I&O (Glor, 2013).

The Department of Social Services income security innovations did not survive the next government. The WCB I&O did, to the present. Day care, family income and seniors' income plans remained in name, but their innovative principles disappeared—income security programs returned to being limited programs serving the deserving poor. A good deal of innovation was lost. It has become commonplace for neoliberal governments to abolish or greatly reduce income security programs; little progress in building income security has been made since the 1970s. It will be harder to bring these or other new programs back in the future, as demonstrated by subsequent NDP governments: the province does not have new revenues to work with,

businesses and residents resist new taxes, and the resources of the province, its other major source of revenue, belong to the people of the province in name only.

These important innovations went by the wayside as a function of politics and neoliberal ideology, which has consistently targeted income security programs and the poor. This strategy was developed by the Chicago School of Milton Friedman and overall created a counter-revolution from the liberal and social democratic dominance after World War II to privatization, free trade, free markets and much greater inequality. Such action has not been irrational, but deliberate (Klein, 2007). Some argue the ideology itself is irrational and does not work to increase economic growth except to be benefit of the already rich. It does increase inequality (Klein, 2007; Krugman, 2012; Piketty, 2014; Stiglitz, 2014). Rather than creating this kind of instability in government and society, some innovations, especially innovations that help to create more acceptable levels of inequality, should be beyond politics—they could be left in place by subsequent governments, as they were during the period after World War II. But, as Howard A. Doughty asked: “Are the dominant institutions and the hegemonic social forces that so obviously control national policies and practices in both the private and the public sectors open to changes?” These results are very important both for practitioners, as they point the way to successful I&O, and for scholars, as they help to understand the important factors and clusters influencing the fate of I&O, and for voters, who must try to sort out the meaning of the proposals presented to them by political candidates.

***Future research.*** The next step in this research should be to determine whether the factors and clusters identified were able to predict the fate of individual I&O. To identify the factors important to the fate of innovations more generally, a minimum of about 60 case studies of the 160 identified in Sask. would need to be assessed to identify six variables. Creation of a population (government) database would allow study of: (1) variations in factors across sectors; (2) demographics of I&O; (3) whether innovation is adaptive for organizations, organizational communities and populations; (4) whether innovation was good or bad for survival; (5) what happens to innovations; (6) how I&O mortality compares to that for normal government populations (Glor, 2013); and (7) what happens to the organizations that implement innovations. An earlier analysis of all of the innovations of the Blakeney government suggested that about a third were social democratic, a third liberal and a third conservative. It may be possible to assess whether and by how much mortality was influenced by the innovations’ ideology and politics. It will not be possible, at this late date, to explore this in the same depth as has been done for income security I&O. Based on what was learned here, it should be possible to study the demography of a portion of the other 155 Sask. innovations. Preliminary work has been completed, that: (1) created a framework for studying the factors affecting I&O; (2) identified theories and hypotheses for examination (Glor, 2015; Glor and Rivera, 2015); (3) developed and tested the reliability and validity of a new innovation instrument exploring factors influencing fate of I&O; (4) demonstrated, that the data needed to study the demography of Sask. I&O, 1971-82 can be collected; and (5) identified factors and clusters of factors influencing the fate of I&O. Future research should determine whether information can be secured for crown corporations, especially, as the NDP government used this structure considerably to stimulate economic development. Future research could identify the politics of the innovations, study innovations from each political domain, including ones more/less highly ideologically loaded. The fate of as many as possible of the remaining 155 innovations should be studied. Such a study

would be the first on the demography of the innovations of an entire innovation population. This approach would also be useful for the evaluation of other public innovations in other national and regional governments. Based on the demography of I&O, this research could help to answer “what happens to I&O”?

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**Eleanor D. Glor** worked in the Canadian public sector at four government levels and has written about public sector innovation since the 1980s. She ran the Innovation Salon, a meeting on public sector innovation, from 1995-2005 and is the publisher and founding editor of *The Innovation Journal: The Public Sector Innovation Journal*. She is Fellow, McLaughlin College, York University, Toronto. In this series, she published four previous papers, <http://www.innovation.cc/all-issues.htm>. In 2018 she edited and published three chapters in a book of articles from *The Innovation Journal, Leading-edge research in public sector innovation*, published by Peter Lang (<https://www.peterlang.com/view/title/64504>). Eleanor can be reached at: [glor@magma.ca](mailto:glor@magma.ca)

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## Appendix I: Summary of Findings

Question	Measure	Result
<b>Question 1: Do the factors cluster? If so, which ones?</b>		
<i>Question 1a. Can factors with similar scores, in times 1 and/or 2, be grouped?</i>	Five measures: (1) Similarity of mean scores during same time periods; (2) Similarities in changes of mean scores for I&O that survived/terminated; (3) Similar levels of change; (4) Highest, medium and lowest scores; and (5) Most different regression coefficients across time periods. Conceptually, (5) would be best but it is not very useful in this context.	Yes. In Time 1, the most & least important factors were similar for I&O that survived & terminated: economy, resources, external support, effects (Table 2b). In Time 2, for I&O that survived, highest scores were for politics, external support & ideology. For I&O terminated, highest scores were for ideology and politics. Scores changed considerably from Time 1 to 2: the biggest changes (declines) were in economy, resources & effects. External support increased for I&O that survived, decreased for those terminated. Two increased: ideology and politics. Biggest changes were for I&O terminated. Clustering was found for ideology and politics and resources and effects, maybe for economy, resources and effects in both Time 1 and 2.
<i>Question 1b. Are factors related to each other</i>	Three types of factors explored: External Type 1 (politics and ideology), External Type 2 (economy and external support), Internal Type 3 (resources, effects).	Yes. Type 2 and 3 factors appear to be related as their scores are similar in both times 1 and 2, and they move in the same direction. Similarities are less clear within Type 2 factors.
<b>Question 2: Are there clusters of factors? If so, which ones?</b>		
<i>Question 2a: Are there three clusters (types of factors)? If so, which ones?</i>	Compare mean of means of types 1, 2 and 3 clusters.	Yes but not as helpful as wished. Type 1 cluster (ideology, politics) increased in Time 2. Increases in ideology and politics were negative influences on the survival of I&O; they increased the most for terminated I&O. Overall, the scores of both Type 2 (economy, external support) and Type 3 (resources, effects) clusters declined from Time 1 to 2; they changed from positive to negative influences; no Type 2 or 3 factor mean increased. External support, however, moved in Time 2 in two opposite directions for surviving & terminated I&O: up for surviving, down for terminated I&O.
	Mean scores of factors for I&O that survived/terminated.	Yes . <i>Survived</i> : The combined mean scores in Time 1 for I&O that survived in Time 2 were all above 3.0 (neutral) except ideology (politics were the next lowest score). In Time 2, external support had the highest score (most important factor) for I&O that survived. <i>Terminated</i> : Scores for ideology and politics for I&O that survived were lower than for I&O that were terminated. Ideology and politics had the highest scores (most important factors) for terminated I&O in Time 2. Type 2 and 3 factors had a positive influence on creation and survival. Type 1 factors had a negative influence on both creation and survival (See 3a, b, c).
<i>Question 2b: Are there external and internal factors?</i>	Combinations of two factors	No. Treating Type 2 external factors as one group obscures differences rather than revealing them: external support and economy score and move differently.

<b>Question</b>	<b>Measure</b>	<b>Result</b>
<i>Question 2c: Is there a resource-related (Type 2+3) cluster? Are political (Type 1) and resource (Type 2+3) clusters different from each other?</i>	Can Type 2 and 3 (support) factors be combined? No. Can they be combined in comparison with political factors?	Yes ANOVA: Type 2 and 3 factors are different. ANOVA: Political (Type 1) and support (Economy+ Type 3) factors are different. There are political and support factors.
<i>Question 2d: Are there power &amp; support factors?</i>	Can the political cluster (ideology, politics) and external support be combined and compared with the support cluster (economy, resources, effects)?	No. The best combination of factors is political (ideology, politics), external support and support (economy, resources, effects) clusters. External support does not behave consistently with the other clusters and must be treated by itself.
<b><i>Question 3: Can political and support clusters and external support factor predict global (survival/termination) I&amp;O fate?</i></b>		
	Political and support clusters, external support factor for survived/terminated I&O in times 1 & 2.	Yes. Compared to support cluster, external support factor scored lower in time 1 and higher in Time 2. Compared to political cluster, external support factor scored higher in Time 1 for I&O that survived in Time 2 and lower in Time 2 for I&O that terminated. External support is an important, self-standing factor in the fate of I&O, in keeping with the expected directions. The combination of political and support clusters and external support factor successfully predicted global (survival/termination) fate of I&O.