The Liability of Renewal: The Impact of Changes in Organizational Capability, Performance, Legitimacy and Pressure for Change

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Abstract

Organizational change has remained an important subject for many researchers in the field of organizations theory. We propose the importance of organizational liability of renewal through a model that examines how an organization can overcome potential rigidities in organizational capabilities from learning by changing capabilities. We examine whether an established organization can overcome liability of renewal by changes in organizational capabilities and how the organizational renewal process reflect on the balance between the dynamic aspect of organizational learning as demonstrated by changes in capabilities and the stabilizing aspects of organizational inertia. We found both positive relationship between organizational learning and performance, and between legitimacy and performance. Performance and legitimacy have, however, a negative relationship on the pressure for change.

I Introduction

Organizational change remains an important field of research in management for many scholars. Many schools of thought have discussed the period of change that new or established organizations need in order to adapt to a new environment as a critical time in which some organizations may fail. Aldrich and Fiol (1994) discussed the birth of an organization and its ability to survive as a period of "liability of newness". They argued that this period of time can be a critical one for a new organization to adapt to the new environment. This kind of struggling to survive during the liability of newness phase may increase the probability of gaining or losing organizational legitimacy. On the other hand, Freeman, Carroll and Hanna (1983)

argued that organizational death can occur at any time or age. We contend that organizational death and loss is seen in organizational rigidities that may happen at any time or age and for an incumbent organization attempting to regain its performance after a loss, it enters a period of risk for losing organizational legitimacy, we term the liability of renewal.

Structural inertia is an implicit aspect of this study which can be a cause as well as an obstacle of organizational change. An organization seeks to change in order to gain sustained competitive advantage. In addition, an organization tends to change its tangible and intangible elements in order to be successful. Therefore, an organization must have processes in place for continued learning and adaptation which can be called the organizational renewal process. What effects or stimulates this renewal process and how it operates within an organization is an important aspect that is still not well understood.

Amburgey, Kelly and Barnett, (1993) argued that whenever an organization initiates a major change it resets its organizational clock. We contend that resetting an organizational clock is equal to changing organizational capabilities that lead to attempts at regaining legitimacy through improving performance, which leads to a hazard state[1)], which we call liability of renewal. The liability of renewal, in our case, can be defined as whenever an old established organization tries to minimize errors to re-gain legitimacy throughout a process of organizational learning from changes in capabilities which aim to improve its performance.

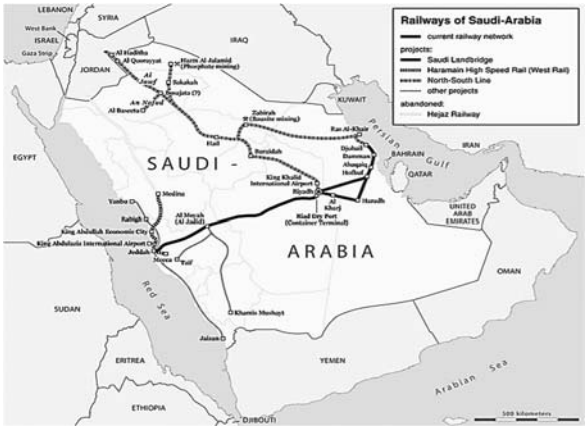
In this paper we aim to investigate the liability of renewal of the Saudi Railway organization (SRO). The first section highlights the establishment of SRO and presents the problem statement including the research question. In the second section, we develop our conceptual model and the main propositions of this paper. In the third section, we examine the research methodology and how we collect the research data. In the final section, we analyze the data and discuss the findings and conclusion of this paper. In order to understand the process of organizational renewal in the Saudi Railway Organization, it is important to understand the establishment and the history of the organization; we examine this in the next section.

II Introduction to the problem statement and research question

The Saudi Railway Organization (SRO) started construction on October 1947 and the first line was inaugurated on October 20, 1951. It was initially run by Aramco a private company, but subsequently transferred to the state and since 1968 has been operated as a state-owned corporation. As a state-owned company that operates Saudi Arabia's rail network, SRO provides

freight and passenger services on two main lines totaling 1656 km as can be seen in *figure 1*. These connect Riyadh with the port of Dammam on the coast of the Persian / Arabian Gulf.

Figure 1: SRO main lines map.

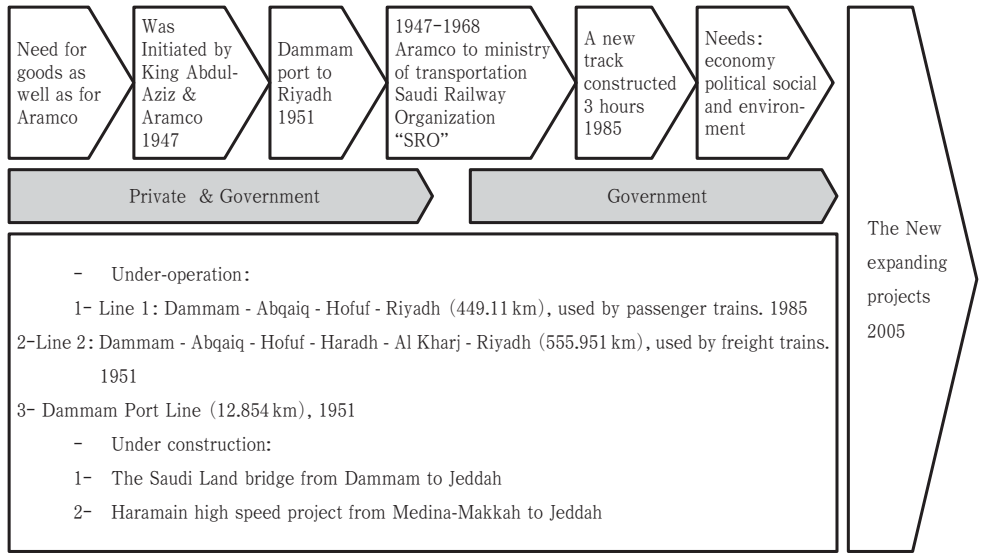


Source: The Saudi Railway Organization

SRO went through different stages of change and development as can be seen in *figure 2*. In 2005, new projects were proposed for SRO by the Saudi government. The initiation of new expanding projects resulted in SRO being unable to adapt to the new environmental demands. From this result we can summarize two consequences. First, the SRO failure to adapt to the new project indicates that SRO could be exhibiting structure inertia. Second, this failure in its performance could have impacted SRO's legitimacy. As a result the Saudi government established a new railway organization, The Saudi Railway Company (SAR), to carry out the new project, but it did not close down SRO. Instead SRO was given the opportunity to try again since it was determined that having two functioning railway organizations would be better than just one. Part of the impact on SRO's legitimacy has been to stimulate an attempt by SRO to enhance its organizational capabilities, performance and learning.

The major question addressed in this paper is whether an established organization can overcome liability of renewal generated by changes in organizational capabilities and how the organizational renewal process reflects on the balance between the dynamic aspect of organizational learning as demonstrated by changes in capabilities and the stabilizing aspect of organizational learning as indicated by organizational inertia. We examine the period from 2005 to 2012 and focus on SRO's attempts at organizational renewal. One reason behind choosing this period of time is that the Saudi government initiated its new expansion project from 2005. At the same

Figure 2: Institution timeline of the railway in Saudi Arabia



Source: the Saudi Railway Organization

time, the Saudi Government has pushed a new private company into the market which is called Saudi Railway Company (SAR). The lunch of SAR is an indication of the loss of SRO's legitimacy. Hence, we considered this period of time to be a critical one in understanding SRO's attempts at overcoming the liability of renewal.

Ⅲ Literature review and hypotheses development

1 Railway system and organizational change, empirical studies on railways systems

In order to put SRO's change attempts in context, we need to examine how railway organizations have changed overtime. Organizational change in the railway system is connected with the restructuring of the institutional environment in terms of nationalization and privatization. In studying privatization, Misutani and Uranishi (2003) looked into the main factors that increase the total factor productivity (TFP) of the privatization of the Japanese railway. They found that TFP was growing with 0.59% annually. Another study by Mitsutani and Nakamura (2004) aimed to explain the Japanese approach to railway reform and lessons learned from the privatization process. They found that the Japanese approach to privatization improved productivity, cut operating deficits, decreased fares, and provided better services. In addition, Obermauer (2002) argued that fully privatized organizations were more efficient in the

domestic and the international market. A study by Lodge (2003) discussed the regulatory change in the railways in Britain and Germany. It argued that organizational learning and transfer processes could be better understood through an institutional perspective in each country. Thus the institutional environment is an important consideration.

Also from these studies we believe that state-owned organizations have constraints on their productivity and such constraints impose structural inertia. This appears to be the situation currently confronted by SRO. Given the importance of railway system to change as well as the importance of transportation in the movement of goods and people, especially in developing countries, there is a need for studies which examine organizational attempts to renew their capabilities within the context of being state-owned and to understand the liabilities generated in this process. We explore these issues in details in the section below.

2 Institutional economics and organizational change

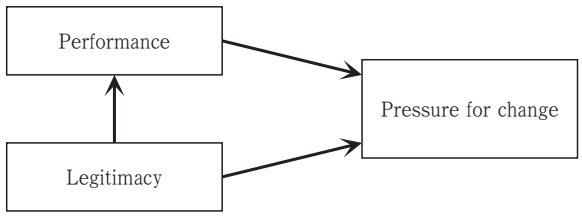
It is important to understand how institutions change and how these changes influence organizational change especially in terms of organizational legitimacy, since organizations exist in an institutional setting. The institutional environment has a strong influence on the legitimacy of an organization. North (1991) has defined institutions as rules for governing the exchanges that occurs in society. Human beings have devised constraints on the institutional transformation process in order to regulate it, including formal and informal rules (North, 1991). An important notion of the study of Kingston and Caballero (2009) was that some theories indicated the importance of deliberate action in the birth of institutions usually through some political process, while other theories saw institutions as emerging through a more bottom up evolutionary process. Holm's (1995) study has argued that understanding institutional change has problems which can be solved if institutions are seen as a nested system. He argued that the nested system is an interconnected, multilevel system in which each action-level is a framework for action and a product of action. His perspective on the nested system relies more on endogenous processes than exogenous forces in explaining institutional change (Holm, 1995). Greenwood and Hinings (1996) posited that the internal dynamic of an organization will strongly influence the ability to respond to pressure for change that originate from institutional sources. We contend that such institution transformation processes have had an influence on the organizational legitimacy which increases the likelihood of environmental pressure for change. We propose a model, which is a nested model that incorporates internal change processes nested within processes that affect legitimacy and pressure for change. Organizations

can choose to adapt to these pressure for change or not. Each alternative, to adapt or not, has risks associated with it.

We assume that the level of organizational adaptation to the new environment can be decided based on current capabilities and the pressure for change which is influenced by the legitimacy as well as by the organization's performance. Therefore, we assert that such action and subsequent reaction increase the likelihood of an organizational surviving the period of liability of renewal.

Organizational change theory suggests that environmental changes that cause organizational decline in performance will lead to pressure for change. We expect that decreases in organizational legitimacy will also influence performance and that both lower performance and loss of legitimacy will lead to pressure for change on the organization. These relationships are summarized in this portion of our model in figure 3.

Figure 3: The relationship between legitimacy, performance, and pressure for change.



3 Population Ecology and organizational change

Population Ecology theory contends that when an old organization attempts to adapt to a new environment, usually it fails and ceases to exist. Structural inertia is an important aspect of this theory which can be seen as an obstacle to organizational change. Hannan and Freeman (1984) indicated that structural inertia influences most features of an organization's structure. In their study, they indicated two features are important to organizational structure: one is the organization's core (goals, forms of authority, core technology and marketing strategy) and the second is organization's peripheral that is established to protect an organization's core from uncertainty in the environment. They also predicted that core feature change will increase the probability of organizational failure and thus ceasing to exist (Hannan and Freeman, 1984). They noted that formal organizations have two important advantages over other collective actors; that is, their ability to perform reliably (in terms of capabilities) and to account rationally for their action (in terms of legitimacy). Both organizational reliability and accountability requires organizational structures that are reproducible or stable over time (Hannan and

Freeman, 1984; Kelly and Amburgey, 1991).

Sastry (1997) argued that internal factors influence organizational change such as routine for monitoring organization-environment fit and trail period following a reorientation. Haveman (1992) proposed that organizational change can be beneficial if it builds on established routines and competences, thus decreasing the liability of renewal. On the other hand, Gilbert (2005) discussed the distinction between resource rigidity and routine rigidity regarding effects of threat perception on inertia. He found that resource rigidity can be overcome but simultaneously can amplify routine rigidity. We contend that during the time period of organizational change that is, the period of liability of renewal, changes in organizational capabilities, as seen in changes in resources, influence both the learning process which attempt to increase performance but can also examine the lags as routines attempts to catch up and have the capability may remain inert and generate lags in adaptation and negatively effects changes in organizational capabilities.

We contend that attempts at change even with the attendant organizational liability of renewal offer a survival chance for an old organization. The organization must renew its capabilities as seen in increased use of resources to adapt to the new environment and balance these with inertial forces in the organization as routines to catch up.

4 Organizational learning and organizational change under the pressure for change

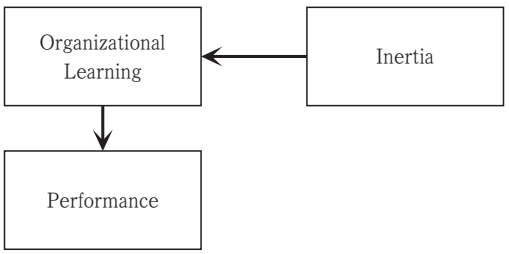
Organizational change always requires organizational learning which is important to increase organizational capabilities. Further, learning is not only differentiated by goal, that is exploratory or exploitative but it is also differentiated by means, that is direct, indirect and vicarious (Barnett and Hansen, 1998; Terlaak and Gong, 2008; Mitsuhashi, 2011; Greve, 2005; Levinthal and March, 1993; March 1991). In this paper, we are trying to study how organizational learning as an implicit process is inherent in the liability of renewal. Hernes and Irgens (2012) discussed organizational learning under continuity in a way that they thought that learning from past cases can be helpful in the present as well as an exploration of the future. Thus providing an intermediate ground between organizational change being successful and organizational change leading to catastrophic failure.

In the discussion of Population Ecology, we saw how an organization may fail to adapt to a new environment. The degree of failure matters. With catastrophic failure an organization ceases to exist, but with non- catastrophic failure an organization has an opportunity to renew itself. We assert that non- catastrophic failure to adapt to the new environment causes

pressure for change to learn from failure. We expect that when pressure for change becomes high, organizations seek for new knowledge in order to add new capability, whereas when pressure for change becomes low an organization remains inert. While failure in the population ecology view leads to the demise of the organization, we adopt a dynamic capabilities view that suggest that failures that are less than catastrophic leads to lower performance and that in turn leads to adaptation through exploratory capability building activities.

In terms of dynamic capability, Ambrosini, Bowman, & Collier, (2009) suggested three levels of dynamic capabilities. According to their study, "these levels are related to managers' perceptions of environmental dynamism. The first level is "incremental dynamic capabilities" which are concerned with the continuous improvement of the firm's resource base. The second level is "renewing dynamic capabilities" which are refreshing, adapting and augmenting the resource base. These two levels are usually represented as dynamic capabilities. The third level is "regenerative dynamic capabilities" which have an impact on firm current set of dynamic capabilities". Capabilities have an effect on organizational performance. A study by Protogerou, Caloghirou and Lioukas (2008) investigated the direct and indirect relationships between dynamic capabilities and firm performance. They found that dynamic capabilities have a positive impact on firm performance in environmental change. We assert that changes in organizational capabilities have a positive effect on the performance. We summarized these aspects of our model in *figure 4*.

Figure 4: The relationship between inertia, organizational learning and performance.



IV Conceptual model and propositions:

We have examined several research literatures that are important in building our conceptual model. From these research literatures, we have identified the relevant variables, and general relationships among the variables. We turn our attention to how these variables and their

relationship are expressed in our model.

For the first proposition, we infer that structural inertia may decrease organizational capabilities. Hence, whenever an organization has high levels of structural inertia it will have negative influence on changes in its organizational capabilities. From this we also infer that changes in organizational capability reflect the dynamic or exploratory influence of learning. This leads us to the first proposition:

Proposition 1: Inertia has a negative relationship with changes in organizational capabilities.

We argued that changes in organizational capabilities can be regarded as changes in organizational learning. We are assuming that the dynamic aspects of learning will generate changes in organizational capabilities and these will result in improvement in how organizations perform. Singh, Chan and McKeen (2006), built on the theory of knowledge management capability to indicate how an organization can improve performance. They found that organizations should pay attention to investing more in its knowledge processes to improve its performance. We assume that changes in organizational capabilities are a result of these knowledge processes and will lead to high performance. This leads to our second proposition:

Proposition 2: change in organizational capabilities has a positive relationship with changes in performance.

Legitimacy also can affect performance especially if certain organizational practices become normative, in that case legitimacy gains can become more important than performance improvements (Guo, 2012). Further the relationship between performance and legitimacy is affected by the type of environmental contingency or crisis such as the one suffered by SRO in 2005. In a study on crisis, Breitsohl (2009), found that "crises are indeed characterized by a loss in legitimacy, the specific dimensions depending on the type of crisis" (Breitsohl, 2009).

We assert that institutional change can have an impact on the legitimacy of an organization and that leads to a decrease in performance and vice versa. Here we assume that organizational legitimacy can be impactful on performance. This leads us to our third proposition:

Proposition 3: Legitimacy has a positive relationship with changes in performance.

Following the notion of "for each action there is an equal and opposite reaction", we believe that decreasing an organization's performance which causes loss of organizational legitimacy will lead to an increase in pressure for change. Environmental change for a state-owned

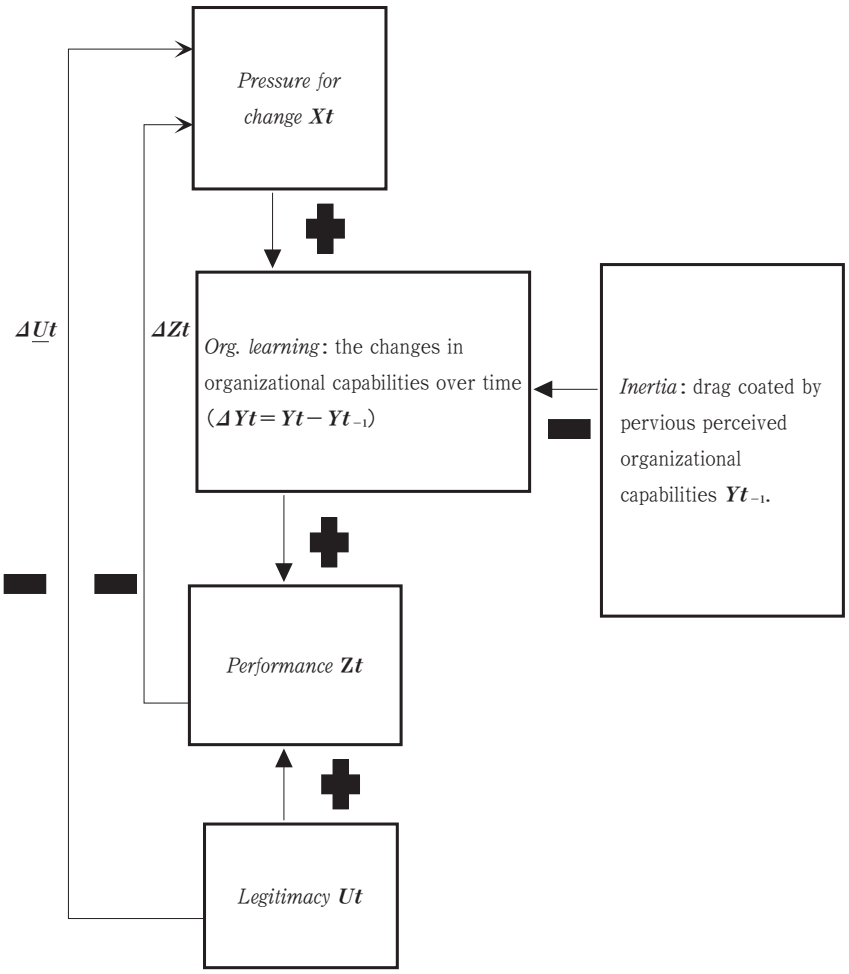
company is reflected in changes in legitimacy as expressed by its major stakeholders, the governmental losses in legitimacy from their stakeholders increases the likelihood of pressure for change. We assume that organization decreased in performance and losses in legitimacy lead to pressure for change. This leads us to our fourth and fifth proposition:

Proposition 4: changes in performance have a negative relationship with changes in pressure for change.

Proposition 5: changes in legitimacy have a negative relationship with changes in pressure for change.

A key element which links the liability of newness with the liability of renewal is the extent

Figure 5: The conceptual model:



to which organizations can learn. Here, one aspect of the links between the liability of newness and the liability of renewal is that an old organization seeks to learn from failure. As we assume, in propositions 4 and 5, that loss of legitimacy and decrease of performance lead to pressure for change, we also assume that pressure for change has a positive impact on changes in organization capability. This leads us to sixth proposition:

Proposition 6: Pressure for change has a positive relationship with Organizational learning.

The components of our model shown in *figures 3 and 4* and the propositions offered above are shown in our complete model in figure 5.

V Methodology

1 Variables in Equation

In this paper we choose relevant variables as can be seen in the Table *1*. We explain the relationships among variables and our measures and the reason for choosing these measures in Table *1*. We discuss these as follows:

First: *Organizational capabilities denoted as Y*. we are examining core capabilities of the organization. These core capabilities as represented by the Y variable are measured in terms of number of wagons for freight, number of freight trips, total number of freight cars, number of passenger cars and staff. This is in keeping with the study of Gilbert (2005). We should note that in this study the number of passenger cars remains the same over the time series and then the number jumps from 75 cars to 115 cars in 2012. This may have an impact on our results.

Second: *Performance denoted as Z*. This variable is measured by the number of passengers, number of containers, Tons of freight, freight revenue and passenger revenue. We decided these measures based on railway's industry common performance measures during the suggested period of time.

Third: *Pressure for change denoted as X*. This variable is measured by percent of yearly achieved goals, passenger expenses, Freight expenses, ratio of freight train accidents and ratio of passenger train accidents.

Fourth: *Legitimacy denoted as U*. This variable is measured by budget paid by the Saudi government. In measuring all the above variables, we denoted time series as $_{(t)}$, and the time lags as $_{(t-1)}$.

2 Difference equation model

It was suggested that in order to test our model and these propositions, this study applies a difference equation approach. We test these propositions using a time series from 2005-2012 to understand the relationships among organizational inertia, organizational capability, legitimacy, performance and pressure for change. The model is summarized by equations 1 through 3, to which we apply regression analysis.

Equation 1: $\boldsymbol{\Delta Yt = a_0 + a_1 Xt_{-1} + a_2 Yt - 1 + \varepsilon t}$

Where: $Yt-1$=Organizational capability lagged one year as our indicator of inertia.

$\Delta Yt = Yt - Yt-1$=Changes in organizational capability as indicator of organizational learning.

Xt_{-1}=Pressure for change.

Our first equation aims to test the relationship on learning for propositions 1 and 6. In this equation we denote changes in organizational capabilities as learning as ΔY as the dependent variable and lags in organizational capability as organizational inertia as $Yt-1$ and the pressure for change Xt_{-1} as the independent variables. This equation was recommended by Preece (1984) in his paper, which called for the use of mathematical modeling for understanding of learning. From this equation we expected to show the organizational inertia level by using the regression coefficient of the lagged capability variables. A negative coefficient indicates negative learning, that is, inertia in the organization in that it has a damping effects on the organizational capabilities. Organizational learning is indicated in our model by changes in organizational capabilities, ΔYt.

Equation 2: $\boldsymbol{\Delta Zt = b_0 + b_1 \Delta Yt + b_2 Ut + \varepsilon t}$

Where: $\Delta Zt = Zt - Zt-1$=Changes in organization performance

Ut=Legitimacy

The second equation measures the relationship between changes in organization performance ΔZt by changes in learning ΔYt and legitimacy Ut. This equation aims to test propositions 2 and 3.

Equation 3: $\boldsymbol{\Delta Xt = c_0 + c_1 \Delta Zt + c_2 \Delta Ut + \varepsilon t}$

Where: $\Delta Xt = Xt - Xt-1$=Changes in pressure for change

$\Delta Ut = Ut - Ut-1$=Changes in legitimacy

The third equation measures the relationship between the changes in pressure for change ΔXt by measuring changes in organization performance ΔZt and changes in legitimacy ΔUt. This equation tests propositions 4 and 5.

In all equations we test our propositions through regression analysis for each dependent variable with only two independent variables. In the equations we test each equation separately and not simultaneously. This was because the numbers of variables are large, but observations per variable are very small (seven years). If we put all relevant variables in a single equation all the parameters could not be measured simultaneously. Thus we chose to test each dependent variable against the two independent variables separately. For example, in order to evaluate the first equation, we run regression analysis for each organizational capability measure separately against lags of pressure for change and organizational capability measures.

To examine SRO and since it is state owned organization, we got a permission from the Saudi Minister of Transport Gebara Bin Eid to collect all the data needed in this paper. So we collected all the data from SRO directly.

Table 1: The relationships among variables and our measures.

Variable codes		Variable names	Conceptual definition of variables	Operationalization (measurement definition) of variables	Why these measures are used for each variable
Y	**N.W.F**	Yearly No. of wagons of freight	Organizational capability related to operating freight.	No. of freight wagons per single trip *No. of total freight trips per year	This measure is related to the core capability of the amount of transported freight.
	N.F.T	Yearly No. of freight trips	Organizational capability related to operating freight.	No. of total trips per year/ No. of freight wagons per single train	This measure is related to the core capability of transported No. of wagons.
	N.F.C	Total No. of freight cars in each year	Organizational capability related to add cars to the freight operation.	Added No. of freight cars in each year	Adding more cars increases the core capability of fright operation.
	N.PC	No. of passenger cars in each year	Organizational capability related to add cars to the passenger operation.	Added No. of passenger cars in each year	Adding more cars increases the core capability of passenger operation.
	S	Staff	Organizational capability related to add No. of staff to both freight and passenger operation.	Added No. of staff in each year.	Adding more staff increases core organizational capability to handle freight and passenger operation.
Z	**P**	Passenger	Organization performance related to passenger operation.	Registered No. of passengers in each year.	In the railway system the No. of passengers is related to passenger operation performance.
	C	Container	Organization performance related to freight operation.	Registered No. of containers in each year.	In the railway system the No. of containers and tons of freight are related to freight operation performance.
	T.F	Tons of freight	Organization performance related to freight operation.	Registered tons of freight in each year.	
	P.R	Revenue of passenger operation	Organization performance related to passenger operation.	Registered passenger revenue for operation in each year from the financial statement of SRO.	Both freight and passenger operations' revenues are related to the performance outcome.

	F.R	Revenue of Freight operation	Organization performance related to freight operation.	Registered freight revenue for operation in each year from the financial statement of SRO.	We use these measures to evaluate organization performance.
X	% **Ach G**	Percentage of achieved goal each year	Pressure for change	% of achieved goal from the financial statement of SRO in each year.	We find this measure as pressure for change, we think that if the organization couldn't achieve its goals in a year it will be forced to improve to achieve it in other year.
	F.EX	Expenses of freight operation	Pressure for change	Registered freight expenses for operation in each year from the financial statement of SRO	Since SRO is a state-owned company, both expenses paid by the government can be related to pressure for change.
	P.EX	Expenses of passenger operation	Pressure for change	Registered passenger expenses for operation in each year from the financial statement of SRO.	
	R. F.Ac	Ratio of freight accidents	Pressure for change	No. of total freight trips per year / % of total accident per year	This is a measure of pressure for change since any increase in accidents will increase pressure to improve.
	R. P.Ac	Ratio of passenger accidents	Pressure for change	No. of total passenger trips per year / % of total accident per year	
U	**Bud**	Budget paid by the government	Legitimacy	The amount of money paid by the government year from the yearly financial statement of SRO	Since SRO is a state-owned company its major stakeholders is the government. Budget is a payment, which can be regarded as a source of legitimacy,

VI Result

Table 2, shows the result for proposition 1 and 6 which includes the relationship between changes in organizational capabilities as an indicator of learning as ΔY as the dependent variable and the lags of both organizational capability as Yt_{-1} and the pressure for change Xt_{-1} as the independent variables. As we noted in our model Yt_{-1} is an indicator for organizational inertia. In this table, the results of the regression analysis are displayed. The study found a significant (<0.1 or <0.5) and positive relationship between changes in learning and pressure for change which supports proposition 6. This indicates that pressure for change has a positive effect on organizational learning.

Looking at *Table 2* in more detail, we found that the measure for pressure for change as indicated by the lag in freight expenses has a positive and significant effect on the change in organizational capability as measured by the change in the numbers of freight and passenger cars and also significantly and positively affects the number of staff. We also found that the ratio of freight accidents as a measure of pressure for change positively and significantly affects the change in organizational capability as measured by the change in the number of freight trips.

Table 2: The result of equation 1.

Xt_{-1}, Yt_{-1}

ΔY	% Ach G / Yt_{-1}		F.EX / Yt_{-1}		P.EX / Yt_{-1}		R. F.Ac / Yt_{-1}		R. P.Ac / Yt_{-}	
N.W.F	-.398	-.329	-.284	-.245	.251	-.466	.768	-.043	.589	-.105
N.F.T	-.228	-.316	-.713	.222	.271	-.365	.896*	.110	.817	.146
N.F.C	.071	-.463	.851**	-.860**	.200	-.338	-.398	-.723	-.431	-.543
N.PC	.162	-	.725*	-	.179	-	-.457	-	-.766**	-
S	.131	-.193	1.235*	-1.127*	.510	.060	1.068	.822	-.449	-.459

** indicate sg at 0.05, * indicate sg at 0.1

We also found a negative and significant relationship between the ratio of passenger accident and the number of passenger cars which does not support proposition 6. As we noted since the number of passenger cars is almost the same over the time series and we feel this finding, although significant may be more an artifact of data than a meaningful result. Overall, we found that pressure for change increases the likelihood to learn as indicated by changes in capability.

Lag in organizational capabilities Yt_{-1} is our measure of organizational inertia and shows a negative and significant relationship with learning from changes in capabilities ΔY. This is in the expected direction and shows support for proposition 1, which states that inertia, has a negative effect on organizational learning. We found that the lag in organizational capabilities in terms of freight expenses has a significant negative relationship with number of freight cars and the number of staff. We also found most of the measures of organizational inertia were negative although not significant. Since the negative signs are in the hypothesized direction, for an exploratory study, we feel this supports proposition 1, overall. We summarize that since SRO did show lags in the changes in its capabilities, SRO seems to have structural inertia. Since the number of passenger cars is almost the same over the time series, this variable could not be computed. Overall, we found that Inertia has a negative relationship with changes in Organizational capability.

Table 3, includes the relationship between changes in organization performance ΔZt by changes in learning ΔYt and legitimacy Ut. In this table, the results of the regression analysis are displayed. This study found a significant (<0.1 or <0.5) and positive relationship between changes in organization performance and changes in organizational capabilities and this result supports proposition 2, which states that organizational learning as understood by changes in organizational capabilities has a positive relationship with changes in performance.

In looking at *Table 3* in more detail, we found that increases in learning from changes in capabilities in terms of changes in number of wagons for freight has a positive and significant

Table 3: The result of equation 2.

ΔYt, Ut=Bud

ΔZt	N.W.F / Bud		N.F.T / Bud		N.F.C / Bud		N.P.C / Bud		S / Bud	
P	.356	.585	.400	.605	-.318	.845	-.740*	.965**	-.015	.588
C	.739*	-.064	.796	-.024	.313	-.331	-.832	.361	.331	-.229
T.F	.746**	-.410	.577	-.303	.795	-1.078	-.305	-.259	.046	-.439
P.R	.224	-.516	.313	-.499	-.530	-.077	-.746*	-.130	-.192	-.426
F.R	.644	.419	.705*	.455	.827	-.274	-.395	.618	.380	.231

** indicate sg at 0.05, * indicate sg at 0.1

relationship with the performance variable as measured by changes in the number of containers and tons of freight. We also found that increases in learning as measured by the change in number of freight trip have a significant and positive relationship with our performance variable as measured by the freight revenue. As we noted, the number of passenger cars is almost the same over the time series. We believe this accounts for the negative relationship find in *Table 3*. Overall, we found that changes in organization capabilities as an indication of the dynamics of organizational learning has a positive relationship with changes in performance.

The result in *Table 3* also supports proposition 3, which states that legitimacy has a positive relationship with changes in performance. We found that our measure of legitimacy (the budget paid by the government) has a positive relationship with changes in performance. The relationship between the budget and the number of passenger shows a positive and significant relationship. Although we found negative relationships between legitimacy and changes in performance, however none of these are significant and we found some are positive. So overall, we conclude that legitimacy has a positive relationship with changes in performance.

Table 4 includes the relationship between the changes in pressure for change ΔXt with changes in organization performance ΔZt and changes in legitimacy ΔUt. Our study found a significant (<0.1 or <0.5) and positive relationship between the changes in pressure for change with changes in organization performance. This supports proposition 4, which states changes in performance has a negative relationship with changes in pressure for change.

In examining *Table 4* in more detail, we found that changes in performance as measured by changes in the number of passengers has a negative significant relationship with changes in pressure for change as measured by changes in ratio of freight trains accidents. We also found that changes in number of containers has a negative and significant relationship with the change in the ratios of both freight and passenger freight accidents. An interesting significant relationship can be seen between passenger revenue and the percentage of achieved goals which does

Table 4: The result of equation 3.

ΔZt, ΔUt

ΔXt	P / Bud		C / Bud		T.F / Bud		F.R / / Bud		P.R / Bud	
% Ach G	.380	-.282	.252	-.321	.284	-.267	-.229	-.505	-.718*	-.645
F.EX	.198	.038	.081	-.005	-.070	-.083	.999**	.265	-.103	-.072
P.EX	-.612	-.578	-.452	-.264	.072	-.288	-.175	-.385	.535	-.175
R.F.Ac	-.828*	-.403	-.913**	-.485	-.465	-.031	-.493	-.220	.065	-.050
R. P.Ac	-.301	.115	-.893**	-.177	-.161	.141	-.501	.082	-.585	.065

** indicate sg at 0.05, * indicate sg at 0.1

support proposition 4. We found a positive and significant relationship between the freight revenue and freight expenses. This may be related to the accounting point of view that whenever revenue increases expenses also increases. We also see this with the positive but insignificant relationship between changes in passenger revenue with change in passenger expenses. Overall, however we found that change performance has a negative relationship with pressure for change.

Our results as reported in *Table 4* support proposition 5, which states that changes in legitimacy has a negative relationship with changes in pressure for change. Although changes in legitimacy (the budget paid by the government) have a negative but not significant relationship with changes in pressure for change, as exploratory study, we feel this sign is in the predicted direction shows support for proposation 5.

Ⅶ Discussion

In this study we examine whether an established organization can overcome liability of renewal by changes in organizational capabilities and how the organizational renewal process reflects on the balance between the dynamic aspect of organizational learning as demonstrated by changes in capabilities and the stabilizing aspects of organizational inertia. Overall we found support for our model and propositions. Through our use of regression analysis we tested our model as it was expressed in the series of difference equations.

As seen in our results, SRO has difficulties in overcoming liability of renewal through changing its capabilities as indicated by the structure inertia seen over the time series. On the other hand it seems that SRO has changed some of it capabilities especially in the freight sector which has allowed SRO to learn from this change and as a result improve its performance. This was indicated by positive relationships between organizational learning and performance. We

also noted that there are positive relationships between legitimacy and performance in our model. This study found that both performance and legitimacy have a negative relationship on the pressure for change. Whenever SRO has low performance and/or loss of legitimacy we found an increase in pressure for change, which in turn affects SRO capabilities positively.

As an exploratory study we choose relevant measures of our variables as can be seen in the *Table 1* to test our propositions. As a weakness of this paper, we tried to measure changes in organizational capabilities as indicator of organizational learning which means that we didn't measure the learning process directly. In the future we will need to develop more direct measures of organizational learning. We also consider the limitation of the time series to seven years as another weakness of our study. We will collect more data over time to increase the data available to examine our variables. Although we were unable measure the whole model simultaneously, we were able to measure all the expected relationship between variables as shown in each of the equations. Therefore we find preliminary support for our model. In the future, with more data and more refined measures of our variables, we will conduct a simultaneous equation examination of our model.

In the future, we will apply this model in different ways on many organizations within the same industry. The expanding projects of the Saudi railway system are ongoing and we expect to have many organizations in the coming years as sites for conducting research.

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Note

1) By hazard state we mean a situation in which the probability of the organization failing has increased

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