

# Resilience in Remote Economies: External Challenges and Internal Economic Structure

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## Abstract

*This paper presents a model that emphasises the role of an economy's internal structure in its response to external challenges. The model is an extension of Thompson's "urban size ratchet" to small, remote economies. Thompson's model suggests the internal structure of economies provides the mechanism of response to external challenges. A number of case studies from Alaska communities show how this mechanism has worked. The goal of the paper is to see if these stories are consistent with the general idea that resilience can be explained by a community's internal structure.*

## Introduction

In September of 1898 gold was found near Anvil Creek in north-western Alaska. Alaska's first gold rush brought people from all over the world in pursuit of gold's promised riches. Nome, Alaska's first modern Arctic community, grew out of this migration. Within a few years Nome became a city of 20,000. However, once the golden opportunities were gone, people moved away. By 1920 Nome had shrunk to 1,000 people. The economic prosperity of this remote northern place disappeared as quickly as it appeared. This is a prospect that haunts remote economies everywhere.

At the beginning of the 20th century Nome, like many remote towns, was a rich poor place. It was remote, on the very edge of North America and the Arctic, far from sources of supply and markets. Nome was in an undeveloped region with little infrastructure or population. In this environment, economic development required a high valued, easily produced resource. For Nome the Bonanza resource was gold, which was both highly valued in the world and easily mined in Nome. Technology, labour and capital moved into the region to mine the gold and the wealth of the region flowed back out. The economy grew on the narrow economic base of gold production, but once the easy mining was done and claims had been established the economic base of the region collapsed.

Remote economies like Nome are not resilient. A resilient economy springs back from any challenge and is not made worse off by its response. Resilient communities aren't static but change in the face of external challenges. A declining

economic base is just one of the types of challenges faced by remote communities. A narrow economic base makes remote regions unstable and vulnerable to any external challenge.

The question of resiliency in remote regions poses a problem both for policy makers and forecasters (Aarsaether, Riabova & Baerenholdt, 2004). Policy makers are focused on what to do to maintain or promote the economies of remote communities – how to make these communities resilient. Forecasters are interested in how a community will respond to challenges in the future as an element of population or economic prediction. History provides no real guide for either policy maker or forecaster; the past is not likely to repeat itself in these remote places.

This paper presents a model that emphasises the role of an economy's internal structure in its response to external challenges. This model could be helpful to policy makers who wish to build resilient economies and forecasters looking for signs of how an economy will respond to challenges in the future. After describing the model in the next section, the paper applies it to a number of Alaska case studies. Following that we examine ways in which the characteristics of resiliency have been developed in the state of Alaska. The final section of the paper presents a summary of these results.

## **Internal Structure and the Response to External Challenges**

The economic base model is widely used in economics to predict the response of a regional or community economy to external changes. The model makes explicit the link between external demand for a community's products and the growth of the local economy. The mechanical multiplier relationship defined in the economic base model is appropriate for examining small changes in the economic environment. However, a richer model is needed to examine the variety and relative scale of economic challenges faced by small remote communities.

Thompson (1972) introduced the 'urban size ratchet' as an early attempt to understand how American cities responded to challenges. At the time, despite facing all types of challenges, there seemed to be no American cities with over half a million in population that experienced an absolute decline in population. The challenges Thompson saw facing American cities were primarily external. The internal structure of these urban economies was the source of their continued relative prosperity.

Thompson hypothesized that "if the growth of an urban area persists long enough to raise the area to some critical size, structural characteristics, such as industrial diversification, political power, huge fixed investments, a rich local market, and a steady supply of industrial leadership may almost ensure its continued growth and fully ensure against absolute decline-may, in fact, effect irreversible aggregate growth" (1972, p. 24). Five structural characteristics were responsible for a city's positive response to external challenges.

- Large economies are diversified. Many industries at varying stages of maturity and with varying growth prospects make up the economic base

of large cities. Diversification provides large cities with time to adjust to challenges faced by any particular industry.

- Large economies have significant political power. Urban areas with a significant number of voters have power to influence government spending, public works projects and the rules that affect the economy. Politics helps these cities limit, mitigate or repair the economic consequences of external challenges.
- Large metropolitan areas have significant fixed private and social capital. Streets, sewers, office space and housing are already available in cities. If an external challenge reduces the use of these facilities they become available to new enterprises at less than their replacement cost, so reduce the cost of introducing new activities.
- Large metropolitan areas have large local markets. Much of the economic activity of cities serves the local population. External changes have less effect on this part of the economy. The large local market may also serve as an attraction for national or international retail and service firms which expand the local economy.
- Large places have more entrepreneurs. These places generate relatively more innovation and invention resulting in expanding old or creating new enterprises. New economic opportunities are being created which replace the old industries that may decline as a result of external challenge.

Thompson suggested that examining the internal character of metropolitan areas may help both policy maker and forecaster think about the future. An area's internal economic structure may be the best place to look for guidance on its future.

While there are few large metropolitan areas in the remote regions of the world, Thompson's urban ratchet idea has a parallel in small, rural communities. The five characteristics Thompson used to define the internal structure of a metropolitan economy can be used to think about the future of small community economies. The internal structure of remote economies defines a mechanism of community resilience. Differences in internal structure help to explain the ways communities respond to external challenges. Thompson's five 'urban size ratchet' characteristics are redefined for small places below:

- Diversification. The typical remote economy has a limited number of basic activities, but economic diversity exists even in the smallest of places. Diversity in remote areas is often seen as a conflict between industrial activities and local production. Diversity may exist within a single industry; for example, a fishing community may catch a variety of species. Traditional harvesting and herding activities add another element of diversification to small remote economies.

Economic diversification provides time for adjustments to be made in response to external challenges. The more diversified a community's economic base, the greater are the opportunities it has to replace lost activity. A more diversified local economy will be more resilient. The effect on resiliency will be greater the easier it is to move between sectors.

- Fixed community assets. The fixed assets of any community include not only its private and public infrastructure but also its human capital, the collective experience from its economic past, and local financial capital. Human capital and social memory are embodied in the local population. A community's stock of fixed assets reflects the things that went before.

A community's fixed assets provide resources for responding to external challenges. If they are released from one industry, they become available for use in new replacement industries. Their availability, however, depends on their mobility. While physical capital is certain to remain in the community, human capital has the potential to move. Social connections and local quality of life are elements of the community that limit population mobility. The greater the stock of fixed assets available to a community the more resilient it is likely to be in the face of external challenges.

- Local market. Fishing, timber, mining and other resource activities producing for export often form the economic base of remote communities. Some portion of production in these industries may also serve the local market. Traditional herding, harvesting, and fishing activities that produce locally for local consumption provide the reason for many remote communities. Government also provides a component of the local economy through transfers that provide local jobs and disburse goods and services from higher levels of government. These activities are likely to occupy a relatively large part of the economy in many small communities and will be independent from the factors that affect the export industries. Work in the local economy provides community residents with an alternative if there is some disruption of externally oriented economic activity.
- Entrepreneurs. Entrepreneurs are the agents of resiliency. They see opportunities where others see problems. While large places with large populations have many entrepreneurs, small places also have entrepreneurial talent. Entrepreneurs are not just confined to market activities. Social and political entrepreneurs pursue opportunities in community organisation, governmental assistance and legislation.

There are many examples throughout the world of entrepreneur-led recovery in small communities. In these places entrepreneurial talent created new industries to replace those effected by external change. Husavik, Iceland, developed a tourism industry when its whaling industry

was limited by politics (Einarsson, 2009). Kodiak, Alaska, is another fishing community that was able to shift from one fishery resource to another in the face of environmental changes. More resilient communities are more likely to have a larger entrepreneurial element in their population.

- Political power. Remote regions have limited population and this is likely to limit the political power of a region at higher levels of government. Political power allows local communities to affect legislation and influence the flow of resources in response to economic challenges. It may be more important for small remote regions to gain local control over decisions that affect their residents. Local control allows local residents to set the rules that determine the consequences of the use of regional resources. Increased control will limit the challenges posed by decisions made outside the region which affect local resource use.

Thompson was describing the internal elements that promote the resiliency of large city economies, but the same lessons hold true for small places. Small remote communities and regions can be described using Thompson's model. A community will be more resilient the more diversified its economic base, the greater its stock of fixed assets, the larger the local economy, the greater the availability of entrepreneurs, and the more local control it has over local resource use. This framework can be used to identify communities that will be more resilient and able to respond positively to external challenges.

## **Alaska Stories: Community Challenge and Response**

This section discusses the stories of five communities throughout the state of Alaska, which faced a variety of external challenges. The focus is on the role of the community's internal economic structure in each community's response to the challenge. The stories reflect the type of challenges faced by small, remote communities; these include challenges to the local economy caused by changes in the environment, the market, and regulation as well as potential resource development conflicts.

The story of each community challenge is briefly summarised below. The challenge and the particular role that the local economy's internal structure played in the community's response are highlighted. These stories are not presented as tests of a theory. The goal is to see if the stories are consistent with the general idea that resilience can be explained by a community's internal structure. Those interested in a full understanding of the cases reviewed are directed to the set of research studies from which these stories were drawn.

***Salmon Challenge in Chignik Lagoon.*** The Chignik area on the south side of the Alaska Peninsula is a major Alaska commercial salmon fishery. Salmon provides the economic base for communities in this remote region. Alaska limits entry into the commercial salmon fishery. There are about 100 permit holders in this fishery. After its peak in the mid-1990s the ex-vessel value of salmon caught in the fishery began to

decline. This decline was a result of a decline in the fishery catch and a decline in prices. The Chignik fishing communities faced both an environmental challenge and a market challenge.

Knapp (2008) reported on an inventive community response to these challenges, the creation of the Chignik Salmon Cooperative. The decline in earnings was accompanied by an increase in the costs of catching fish and a reduction in the number of boats fishing by the end of the 1990s. In response to this economic crisis some Chignik permit holders took the idea of forming a Co-op before the Alaska Board of Fisheries, which sets fisheries policy. Under the Co-op fewer boats would harvest the allowable catch assigned to the whole fleet. The boats that fished would share both the costs and the catch with the Co-op members. Since fewer boats would fish, this would dramatically reduce the cost of catching the same number of fish. According to Knapp, the Co-op reduced the costs and increased net income in the fishery.

Not all permit holders agreed to participate in the Co-op. Two fishing periods were established to allow Co-op members and non-members to fish for particular shares of the allowable catch. Permit holders who opposed the Co-op took the matter to court. After the Co-op's third season in 2005, the Alaska Supreme Court ruled that the Co-op violated the Limited Entry Act that required permit holders be on the boat when fishing. The Co-op experiment was ended with this Court ruling.

This story illustrates the role of two elements of Thompson's rubric. The creators of the Co-op showed entrepreneurial talent. They found an innovative way to respond to the salmon crisis, invested in the creation of the institution, and took the idea forward to the regulators. While there were many problems with the Co-op idea in practice, experience showed it was a method of maintaining community income in the face of the environmental and market challenges. The ability to implement this mechanism of resilience was limited by the lack of political power or control. Co-op members did not represent all of the permit holders in the fishery and the rules of organisation were established by Alaska law. The Alaska legislature would have to revise the law for the co-op idea to be implemented.

***Regulatory Challenge in the Tongass.*** Sitka is a small regional center in southeast Alaska with a population of less than 9,000 people. It was the commercial and administrative centre of the Russian-American company prior to the sale of Alaska to the US in 1867. To encourage population growth in the region after World War II the federal government provided incentives for timber industry development using the forest resources of the Tongass National Forest. These incentives encouraged the location of pulp mills in Sitka and Ketchikan, another regional center in southeast Alaska. By the beginning of the 1990s the timber industry was an important component of the Sitka economy; the pulp mill accounted for almost 18% of the community's total payroll.

Gilbertsen (2003) describes the effect of the closure of the pulp mill in 1993. The closure of the pulp mill resulted from the increased world market competition, increasing local costs and more restrictive federal timber policies in the Tongass

National Forest. The closure of this important economic component of the Sitka economy presented serious regulatory and market challenges to the community.

The aftermath of the mill closure presents a mixed view of the Sitka economy. In 2001 Sitka had fewer people than when the mill closed but greater employment. Both unemployment and personal income were less in 2001 than in 1993. The Sitka economy also experienced a change in character. Sitka switched from a community based on manufacturing jobs to one based on services. Sitka maintained other core industries and expanded new ones such as tourism, conventions and shipbuilding.

According to Gilbertsen, Sitka has fared better than other south-east Alaska communities in the post-timber economy. He concluded that "the key to this community's resiliency seems to be its diversified economy and willingness to embrace new ideas and opportunities" (Gilbertsen, 2003, p. 9) Sitka's resilience in the face of these challenges illustrate the role of two of Thompson's structural characteristics: the diversity of the local economy and the entrepreneurial nature of the place.

***Regulatory Challenge on the North Slope.*** The coastal villages of the Arctic have been hunting the bowhead whale for thousands of years. The bowhead whale hunt is both economically and culturally significant to the Inupiat people of Alaska's North Slope. The whale hunt is a community event and each whale provides thousands of pounds of meat which is shared by the community. The International Whaling Commission has regulated commercial whale hunting since the middle of the 20th century. In 1976 the Commission placed a moratorium on the subsistence hunting of bowhead whales. This decision was based on observation that the stock of bowheads was about 10% of its historic high. This decision provided the communities of the North Slope with a regulatory challenge to their way of life.

As described by Freeman (1989), the Alaska Eskimo Whaling Commission (AEWC) was formed in 1977 as a result of a meeting of whaling captains called by the mayor of the North Slope Borough, the local regional government. The AEWC disagreed with the population estimates used by the IWC and the method that produced these numbers. The AEWC asked the US government to object to the moratorium and the AEWC was given a small quota. The AEWC also established a scientific research program to develop better information on the bowhead population.

With financing from the North Slope Borough and the state of Alaska, the AEWC used both new technology and traditional knowledge to establish that the population of bowhead whales was almost four times the original estimate and the herd was expanding. The scientific program was well funded and was generally of the highest scientific quality. As a result of these efforts the AEWC was given the management responsibility for indigenous bowhead whaling. The AEWC management responsibility includes assigning quota to villages and educating for best practices in hunting to minimise lost struck whales.

The efforts of the AEWC allowed North Slope villages to maintain the important economic and cultural activity of whaling. The story of the Alaska Eskimo Whaling Commission highlights the importance of fixed assets or what went before to community resilience. Traditional knowledge was used in identifying the problems

with the IWC's initial estimate of the bowhead population. The ability of the North Slope Borough to fund the research and organisational costs of the AEWG reflected the discovery and development of oil at Prudhoe Bay which lies within the NSB. The tax revenues from this oil field provided the funds for the scientific work.

***Development Challenge in Suburban Alaska.*** The Mat-Su Borough is the fastest growing region of Alaska. The Borough is just north of the state's largest city, Anchorage, and attracts commuters looking for land and the Alaska outdoor lifestyle. As Huskey and Protasel report (forthcoming), this lifestyle was challenged in 2000 when Alaska's Department of Natural Resources began a program to lease the shallow natural gas resources in the state.

Shallow natural gas (SNG) lies within 3,000 feet of the surface and was seen as a potential source of natural gas for the state's rural and urban communities as well as a new source of public revenue. To reduce the cost of developing this resource, state legislation allowed producers to bypass regulations that applied to regular oil and gas production and waived requirements for state and local public review and oversight.

When leasing began the majority of the applications were in the Mat-Su Borough. Stories from other states with SNG production told tales of dry and contaminated water wells, wildlife and landscape destruction, and air and water pollution. The challenge to the residents of the Mat-Su was magnified by the system of property rights in Alaska. Most private land owners held only the surface rights to their land; the subsurface rights were held by the state. The state could sell the right to develop SNG under privately owned land. To make matters worse, subsurface rights trumped surface rights; subsurface rights gave their owners rights of access with minimal compensation or safeguards for the surface owners.

This change in state regulations presented a challenge to the residents of the Borough. The residents were able to translate their outrage into political action to limit SNG leasing. As a result of political pressure at both the state and local level the SNG leasing program was placed back under the state and local regulatory safeguards which govern other petroleum leasing programs. Both the state and local government developed significant standards for this type of development. Public pressure and the increased requirements and limitations imposed by new legislation reduced the production companies' interest in Alaska's SNG resources.

This case shows the use of another of Thompson's internal characteristics to meet a regulatory challenge. The area had political power because it was relatively large and had a rapidly growing population. It used its political power to maintain the character of the community the residents desired.

***Development Challenge on the North Slope.*** The Prudhoe Bay oil fields on Alaska's North Slope are an industrial enclave in a lightly populated remote region where traditional economic activities continue to be important. As production from the primary Prudhoe Bay fields declined, oil companies began to explore and develop satellite fields in its vicinity. Haley (2004) has described the challenge that oil development in these satellite fields presented to one village in the region.



One of the largest satellite fields was discovered in 1994 by ARCO near the Inupiat village of Nuiqsut. At the time ARCO was one of the two operators of the Prudhoe Bay field. Development of a major oil field in the neighbourhood of a small traditional village presented a challenge to the village's way of life, including its subsistence harvesting.

The challenge was limited because of the ownership rights village residents had received from the Alaska Native Claims Settlement Act (ANCSA) passed in 1971. ANCSA established regional and village corporations which were given financial and land resources. The local village corporation established under the Act was the owner of surface rights to much of the land that the oil lay under. In addition, the Arctic Slope Regional Corporation, which represented village residents, held significant parts of the subsurface rights in the area. Nuiqsut was also a community in the North Slope Borough, the local regional government.

The ownership rights and government control allowed the village to develop a working agreement with ARCO that guaranteed royalties, rents, property taxes and community assistance benefits to minimise or compensate for the negative effects of development. A Subsistence Oversight Panel was also set up to address the impacts of oil development on subsistence harvests. In this case, community resilience may not have kept things the same, but resources were made available as a result of local ownership and control to respond to and compensate for the negative impacts of development. The creation of the village and regional Alaska Native corporations in 1971 gave residents ownership rights and control over the resources near their communities. The establishment of the North Slope Borough in 1972 gave the village some political control over development.

## **The Alaska Challenge: Creating Resilience**

Alaska's economy has grown and matured since it became a state in 1959. Alaska's economy when measured by employment is more than four times its size at statehood. Alaska's population more than tripled between 1960 and 2010. Production and employment are more stable throughout the year and the economy provides more goods and services for local consumption than at statehood (Goldsmith, 2011).

Resilience remains a concern for the state just as it does for its smallest communities. The Alaska economy is relatively small; population, employment and output are less than 1% of the US totals. Alaska is also far away from US markets and suppliers; it is more than 1,400 miles between Anchorage and Seattle. The distance from markets and suppliers and the limited scale means Alaska remains a high-cost region.

Alaska's historic experience reminds us that remote economies can't be complacent. Alaska has experienced busts as well as development booms throughout its history. Goldsmith (2008a) describes the current economy as built on two uncertain sectors. He estimates that about one-third of Alaska's jobs are generated by activity in the petroleum sector and one-third by federal government spending. While neither the

petroleum nor the federal government sectors will disappear in Alaska, it is possible that in the future each may decline significantly (Goldsmith, 2008b and 2011).

Alaska's response to a possible decline in its major economic sectors will reflect its internal structure. Alaska's growth since statehood has changed its internal structure in ways that are likely to promote resilience. Since statehood the Alaska economy has not only become more diversified, the size of the local market has also increased. Over time more of the goods and services local residents and businesses bought were produced in Alaska (Goldsmith, 2011). This has contributed to a significant decline in the relative cost of living in Alaska. This is the growth-induced structural change that Jack London (1900) described in his defence of the Klondike gold rush. Growth brings structural change that by lowering costs creates the conditions for future growth. According to Thompson's rubric, increased economic diversity and a growing local market should increase the resilience of the Alaska economy.

In addition to the structural change that accompanies economic growth, a number of institutional changes which promote resilience have been adopted. Two of the most important were the ANCSA and the establishment of the state's Permanent Fund. Each of these promotes an internal characteristic that Thompson suggests advances economic resilience.

ANCSA in 1971 was a national institutional change that increased the local control of Alaska's resources. With the passage of ANCSA in 1971 the federal government created 12 regional corporations with surface and subsurface rights to 44 million acres of land. Along with the land transferred to Alaska when it became a state, the ANCSA transfer to these private corporations increased the share of Alaska's resources over which Alaskans had control. Alaska Natives had the political power to effect this change because their claims could have held up the construction of the Trans-Alaska Pipeline (Huskey, 2010). According to Thompson's rubric, by increasing residents' control over decisions that affect them, ANCSA increased the resilience of the Alaska economy.

The state created a significant fixed asset for its economic future when it established the Alaska Permanent Fund in 1976. The Permanent Fund was created to turn a short-term asset – the non-renewable North Slope oil fields – into a long-term asset for use by future state residents. The state collects royalties and bonuses from petroleum production on state lands, and the law mandates that a portion of mineral bonuses and royalties are placed in the Fund. Throughout the years the legislature has made additional special deposits in the Fund. Currently the Permanent Fund has over \$40 billion in assets. This provides an impressive fixed asset for the future which according to Thompson will increase the resilience of the Alaska economy.

The Alaska case illustrates that an economy's internal structure is created in many ways. The internal structure changes with economic growth as Jack London pointed out. It can also be changed through legislation as in the case of ANCSA and the Permanent Fund. Institutional changes that promote Thompson's internal

structural characteristics complement those changes that come with economic growth and both increase the likely resilience of the Alaska economy.

## Conclusion

Thompson hypothesised that the internal economic structure of large urban regions influenced the economic resilience of these regions. He calls this relationship the "urban size ratchet". This paper suggests that a similar relation might be at work in small, remote economies. The internal economic structure of small and remote places might create the conditions of resilience in the face of external challenges. Thompson's five structural characteristics were redefined for remote communities.

Five stories of Alaska communities that faced external challenges were presented to see if they were consistent with the general idea that a community's internal structure can explain its resilience. Communities facing market, environmental and regulatory challenges were examined. Alaska's economic history was presented to illustrate some of the ways in which a remote economy's internal structure might change.

While these examples do not comprise a test of the 'ratchet hypothesis' for small communities, they provide encouragement for further examination of the role of internal structure in remote economies. More actual cases, cases with negative as well as positive outcomes, are needed before any firm conclusions can be drawn. The promise of this approach is that Thompson's rubric could be used both as a predictive tool to identify likely outcomes in a particular place and as a prescriptive tool to suggest policies for communities likely to face challenges.

Small, remote places face many challenges. External challenges may overwhelm a community's capacity to respond. Policies may not be available to reverse this reality for some places. Because not all communities will be resilient, it is important to also focus attention on the resilience of the population in these communities. People may have to move to limit the negative effects of external challenges. Policies should be designed to ensure that they are able to move successfully. The ultimate goal of policy may simply be to make certain that the people in a community facing challenges are better off no matter where they live.

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