



**Diversifying Hawai'i's specialized economy: A
spatial economic perspective**

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Diversifying Hawai'i's specialized economy: A spatial economic perspective

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Abstract

Specialization in tourism exposes the economy of Hawai'i to external shocks that trigger collapses in tourist numbers. Furthermore, Hawai'i's economic growth has diminished for decades as the dominance of tourism has not generated productivity growth. In response, policy-makers in Hawai'i increasingly emphasize diversification. This article examines a spatial economics perspective to explain why Hawai'i is so specialized and to sketch policy for diversification and growth. Isolated, small, and open economies tend to be more specialized in one or a few industries because increasing returns to scale generates a coordination problem for new industries. By targeting industries that use related know-how or a Hawai'i-specific resource, Hawai'i can access productivity gains from the scale of *related* and *location-bound* industries.

JEL Codes: R11, R12

Keywords: Economic growth, diversification, related variety.

1. Introduction

Hawai'i's economy is extraordinarily specialized in tourism, resulting in vulnerability to external shocks and diminishing productivity growth (Kato and Mak, 2013). In response to the economic impact of the COVID-19 pandemic, policy-makers in Hawai'i increasingly emphasize diversification. Alternative industries are asking for support. For example, recent research examines policies to support the agriculture (La Croix and Mak, 2021a) and film industries (La Croix and Mak, 2021b). Some economists are concerned that diversification policy will fund special interests rather than genuine economic development initiatives. Ultimately, the challenge is how to balance the tendency to specialize with promoting resilience and productivity growth.

This article discusses how spatial economics explains why Hawai'i is so specialized in order to sketch strategies for diversification policy. Only this perspective explains why some industries are more difficult in Hawai'i and why a select few are so bound to Hawai'i. As a result of spatial externalities, distance, and internal and external increasing returns to scale, isolated, small, and open economies tend to specialize (Bond-Smith and McCann, 2020). Specialization in tourism is a response to Hawai'i's unique set of spatial constraints and local advantages and disadvantages.

But these arguments are far more nuanced and complex than simply distance, scale, and a tropical location. Specialization is more than comparative advantage, but internal and external increasing returns to scale interacting with the mobility of factors of production that generates a coordination problem for new industries. The insights in this article would also be applicable to community-scale analyses of isolated towns and rural areas across the United States. Understanding how the spatial economic perspective affects the industrial structure and economic development of different places generates very different policy implications in small and isolated places based on local characteristics, endowments and local market failures. The spatial economy perspective makes diversification policy in Hawai'i a kind of riddle, with logical, though counterintuitive, local solutions.

This problem of specialization and volatility is not unusual in small, isolated and open economies (Maskell et. al., 1998; Bos et. al., 2020; Forero et. al., 2021). Other isolated states are also more specialized such as Alaska, the Las Vegas region, Colorado or Maine, though Hawai'i

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is far more isolated than anywhere else. There are productivity benefits from comparative advantage and establishing an industry with sufficient scale due to increasing returns, but very small economies can probably only do this in very few areas. The choice of specialization is a result of hysteresis and resource endowments. As a result, such economies typically specialize in a natural resource industry, since those natural resources cannot be extracted anywhere else. In many states this is *Mining and Oil & Gas* extraction. In the past, and in many rural communities, it is primarily *Agriculture, Forestry and Fishing*. It is more difficult for other industries to become established in small, open and isolated economies because there are productivity benefits from locating these activities in closer proximity due to increasing returns to scale (Krugman 1991).

The spatial economics perspective understands that the location choices of individuals and their economic activities are affected by internal and external, increasing and decreasing returns to scale due to fixed costs and spatial transaction costs. Spatial transaction costs increase to serve customers located further away and decrease if more customers and suppliers are located in close geographic proximity. External increasing returns can generate coordination and hold-up problems for economic development (Matsuyama, 1990; Rodrik, 1996) such that a *firm* is only competitive once the *industry* reaches a sufficiently large scale. As a result, *new* activities are slow to develop until complementary investments are made to increase the scale of customers and suppliers in close proximity. Coordination problems can be solved by industrial policy (Rodrik, 2004, 2007), that stimulates either private (Morck and Nakamura, 2007) or public investment (Rosenstein-Rodan, 1943; Murphy et. al., 1989), to establish the critical scale for a self-sustaining industry or to stimulate agglomeration economies (Kline, 2010).

Such investments describe the recent strategies of several oil-rich countries building extravagant cities and expanding services to prepare for an eventual shift away from oil. But it also provides a narrative for Hawai'i's various past specializations and the potential solutions to diversify its economy. King Kamehameha III made a series of changes to Hawai'i's land tenure system, known as the Great Māhele, that allowed private investment to enable sufficient scale for plantation agriculture. In the late '60s Hawai'i Governor Jack Burns built freeways, several tunnels, housing, a shopping center, an industrial area, and most importantly, *airport infrastructure*, in order to diversify the economy away from plantation agriculture. Stagnating productivity in tourism implies that such industry policy initiatives might be necessary once again. While some may object to this larger role for government, government spending also provides for risk-reduction which is important when Hawaii is exposed to significant external risks (Rodrik, 1998).

The difficulty with such policies is identifying suitable opportunities and structuring any policy to take advantage of market-based incentives and discovery processes. This avoids the pitfalls of "picking winners" and incentivizes productivity growth. Such policy initiatives are uniquely local because they build on existing strengths, capabilities, and resources, and address uniquely local problems and market failures. Similarly, the economic history and the narrative of how a particular place specialized in its comparative advantage is a very local story. It would not be possible to include detailed case studies for multiple economies to explain such narratives in one article. While this article focuses on the story of Hawai'i, the lessons from this approach can also be widely applied to other small, open and specialized economies around the world.

The intuitive responses are to reduce spatial transaction costs, attract footloose activities that could relocate, and support industries that used to be strong. For example, many are hopeful that the work-from-anywhere trend will bring high-value opportunities; some advocate for tax credits to expand the footloose film and television industry; and others want subsidies to re-establish agriculture and locally-sourced foods. But declines in spatial transaction costs do not necessarily lead to development in isolated places because greater advantages accrue to the more-connected places. While the internet means people can work from anywhere, it also means that *the most connected places can serve everywhere*. Similarly, attractive subsidies or tax breaks might attract tech

businesses or film makers, but footloose industries are also more likely to leave than to become sources of long-term economic growth. And lastly, industry policy is often unsuccessful because it persists with supporting a failing industry for far too long. Re-establishing agriculture seems like a good use of land, but Hawaii-grown food is still usually more expensive than imported food and unlikely to lower living costs. Rather, diversification policy will only be successful if it can take advantage of the set of forces that already generate specialization.

The economic geography, spatial economics, and innovation literatures provide insights for such a policy. McCann (2009) describes how economic geography explains the paradox of New Zealand's specialized economy and lagging productivity. He suggests strategic investments to increase connectivity, as well as to increase value-added in key industries. Saunders et. al. (2021) argues for a mission-oriented innovation research program. Balland et. al., (2019) suggests that initiatives should focus on activities *related* to core strengths and uses economic complexity to identify valuable industries. Bond-Smith and McCann (2020) imply that small economies should target existing clusters with a higher degree of within-industry spillovers, since these are *less footloose* and would be more likely to remain. Skilling (2020) argues that large firms provide the productivity frontier in small advanced economies, but large firms might also face too little competition to incentivize innovation in small markets (Bond-Smith, 2022a). The EU's Smart Specialization policy to help lagging regions in Europe provides a suitable guide for supporting local areas of opportunity (McCann and Ortega-Argiles, 2015). Recent testimony from the Brookings Institution at the US Senate Committee on Environment and Public Works emphasizes the importance of local and regional leaders (Liu, 2022). Similarly, Dani Rodrik (2022) and policy-specialists at the World Bank (Ketels and Duch, 2022) emphasize the importance of location- and sector-specific policy. I take insights from all of these perspectives.

The article relates to research on regional economic development. New and existing industries will form clusters of *related* industries. This can be thought of as an extension of the clusters approach (Porter, 1998, 2000, 2011), as promoted in the USA's Comprehensive Economic Development Strategies (CEDs). Much of the economic development literature focuses on subsidies and incentives (McGahey, 2016). I briefly discuss the importance of not "picking winners", such that investments focus on *enabling* activities that address market failures rather than direct subsidies. But the concept of "picking winners" is nuanced by narrowing the scope of broad programs to focus on the most promising opportunities. Florida (2002a, b, c) emphasizes the importance of quality-of-life to attract the so-called "creative class". While others criticize the direction of causality, this might not matter when Hawai'i is already richly endowed with natural and cultural amenities. Rather, I emphasize the need to attract creatives from the targeted feasible areas that are more likely to remain in Hawai'i in the long term.

This article also relates to a growing literature about the economic impact and response to the COVID-19 pandemic. Brodeur et al. (2021) provides an initial survey of COVID-19 economic research. Handwerker et al. (2020) examines labor markets. Altig et al. (2020) examines the increase in uncertainty. Usher (2022) examines the experiences of surfers travelling and hosting visitors during the pandemic, an important factor for Hawai'i, emphasizing the need to diversify coastal economies. In Hawai'i, Fuleky (2022) developed nowcasts of the economic impacts of the pandemic using high frequency indicators. Bond-Smith and Fuleky (2022) discuss the economic effects of the pandemic on Hawai'i by comparing outcomes to the 2019 forecast. The common theme is that economies are unlikely to return to their pre-pandemic situation and new approaches may be required. A similar rhetoric is promoted in policy circles (WEF, 2020).

Recognizing this need from both scholarly research and policy, in this article I provide a forward-looking survey of the spatial economic perspective of the economy of Hawai'i and sketch a strategy for diversification to provide resilience to future shocks. The approach is similar to *Growth Diagnostics* (Hausmann et. al., 2008; Rodrik, 2010): finding a narrative that is consistent

with the observed development issues and prescribing a suitable policy response, though a full diagnostic exercise is more than the page limits of one article. Since the narrative and response relates to the unique set of circumstances and local capabilities, the resulting policy is a *uniquely Hawai'i* economic development strategy. Even with this scope narrowly defined in Hawai'i, the principles for economic development can be widely applied to other small, open, and isolated economies and especially tourism-dependent economies.

2. Why so specialized?

Three key characteristics explain a lot about Hawai'i's economy: isolation, scale and economic integration. But, as I explain in this article, these factors have far more nuanced and complex impacts than simply being too isolated and small to attract and maintain economic activity outside of tourism.

Isolation

Hawai'i is a long way from the rest of the United States. Geographically, Hawai'i isn't even in North America: it is in Oceania. More specifically in Polynesia, though this is more cultural than distance or economic connections would imply. Market access measures such as distance explain significant variation in economic outcomes (Redding and Venables, 2002; 2004). Government regulation and infrastructure can also contribute to isolation. For example, the antiquated Jones Act requires shipping between US ports to use US-built ships and crew, adding to the cost and distance for transporting goods to Hawai'i. Hawai'i's isolation from the rest of the United States generates significant transaction and transportation costs that many industries may be unable to overcome to be competitive.

Spatial transaction and transportation costs incentivize geographic proximity. This means many traded businesses will be more competitive if located in the continental states. This also means that traded imports to Hawai'i face greater costs than they do for people living in the continental states, pushing up both the cost of living and production. As a result of these circular forces, economic activity in Hawai'i is always based on an *immobile* and *local* factor of production—Hawai'i's climate—because these activities are unable to occur anywhere else.

Scale

Hawai'i is small. If it were bigger, a sufficiently large home market would allow it to take advantage of the productivity benefits of internal and external increasing returns to scale to supply both local and export markets (Krugman, 1991).

The limited availability of land pushes up the cost of building space. Ninety-two per cent of the land in a 50-kilometer radius around Honolulu is not developable when much of the area is ocean, mountains, or conservation area. This makes Honolulu the most land-constrained city in the United States (La Croix, 2016). As a result, the cost of holding inventory or hosting space intensive production is exorbitant. As with transport costs, many industries may be unable to overcome the cost of building space to be competitive in mainland markets. This may also explain some of the industrial composition skew towards services in Hawai'i.

Economic integration

Being part of the United States still provides a large domestic tourist market. Access to this large "home market", provides sufficient scale in one industry—tourism—because the many amenities that tourists come to visit cannot relocate. Tourism generates a large "export" income from both Asia and the continent. While each tourist visiting Hawai'i spends less than they used to, the number of tourists continues to grow, reaching a record of 10.4 million in 2019 (HTA, 2020). So integration with the United States gives Hawai'i the ability to gain scale and productivity in its comparative advantage, implying even greater specialization.

Hawai'i is well-connected physically. Even small cities in Hawai'i have frequent flights to global cities such as Tokyo, Seoul, and Los Angeles. The neighbor islands required airports for

travel within the state, so it is straightforward to expand these to long-distance travel. But connectivity may imply even greater specialization patterns because of productivity gains from increasing returns to scale when a region is *connected* to more markets and other needs can be fulfilled by imports. The role of connectivity depends upon *where* a place is connected in the network. Places connected to the ends of a network could be expected to become more specialized while those in more central locations become hubs of activity (Glückler, 2007). In this way Hawai'i's economy was fruitful when it was a hub for crossing the Pacific. In more recent times, Hawai'i is no longer in the middle of the network but at its peripheral endpoint.

The combined effect

These effects interact to generate system level effects that impact small and isolated places differently (Desmet and Rossi-Hansberg, 2014). While the internet reduces spatial transaction costs making it easier for economic activity to spread out across places, counterintuitively the economic world is becoming even more curved (McCann, 2008). This is because as spatial transaction costs decline, activity also rationalizes into fewer locations (Krugman, 1991). For example, in 2002 Hawai'i switched from a state with net exports to a state with net imports (Liou, 2020). The change was caused by Amazon offering free shipping to Hawai'i for orders over a certain amount. E-commerce means that it is more efficient for the most well-connected places to sell *everywhere*, so economic activity clusters in fewer, but more well-connected places.

While the internet makes it easier for University of Hawai'i academics and Hawai'i's businesses to collaborate with US and foreign colleagues (Forman and van Zeebroeck, 2012; 2019), *new* collaborations often require close proximity (Catalini, 2017) because innovations are often only spurred when people meet serendipitously. Serendipity doesn't *yet* occur as easily over the internet. Furthermore, the trust that is required for collaboration can often only be built by meeting face-to-face and "talking story"¹. This is especially important for skilled *non-routine* tasks, where measuring performance is difficult. It is certainly easier for academics to attend conferences as the cost of travel has declined, but the shift to online conferences might reduce the serendipitous benefits. The internet can substitute face-to-face communication, but often the internet is *complementary* to face-to-face communication, particularly for trust-building and serendipity (McCann, 2007). As a result, the greatest advantages of the internet for collaboration also occur in the places that most frequently connect people in person—large scale and highly connected cities—and that isn't in Hawai'i. Most of all this issue affects those early in their careers, implying headwinds for the economic trajectory in Hawai'i and a further explanation for declining growth. This is a modern version of the core-periphery outcome in the New Economic Geography (Krugman, 1991). Since Honolulu is not as large or as well-connected as other major cities in the United States, such rationalization implies even greater specialization in Hawai'i.

As a result of economic geography, isolated, small, and open economies tend to be much more specialized in one or a few industries (McIntyre et. al., 2018; Bond-Smith and McCann, 2020). This is a response to their relatively higher spatial transaction costs, increasing returns to scale, and open integration. Small, advanced, open, and isolated economies gain scale in single, locally-bound industries which benefit from increasing returns to the scale of the industry. The selection of the specialization is a historical accident, such as a natural resource endowment, institutional change or big investment. Businesses that use natural resources, such as Hawai'i's climate, cannot simply shift elsewhere. These are industries that *have* to locate in Hawai'i.

3. The economic case for diversification

There are many reasons to diversify the economy of Hawai'i. Tourism puts pressure on infrastructure and the environment. Tourists using homes and apartments could push up the cost of homes (Barron et. al., 2021). As visitor numbers set records, the social cost of tourism

¹ "Talk story" is a Hawaiian pidgin expression meaning to gossip; rekindle old times; talk with friends; or chit-chat. Talking story is considered to be especially important for doing business in Hawai'i.

may increase relative to the benefits (Mak, 2017; 2018). Declining resident sentiment was reinforced during the pandemic when incomes were protected by federal assistance, cementing a view that tourists were a problem, rather than a source of income. Perhaps most importantly, many Kānaka Maoli² are justifiably concerned about the commercialization of their culture and disregard for cultural values. Furthermore, the high cost-of-living has long generated significant out-migration (Mak and Tyndall, 2020) and spurred concerns for kama‘āina³ and Kānaka Maoli to remain in Hawai‘i. While all of these reasons are important, the scope of such a project would be well beyond this article. Instead, this section focuses on the economic case. I note the importance of these other aspects as components of the solutions presented later in this article.

Short and long-term risks

Hawai‘i’s economy has faced multiple waves of specialization since traders first arrived, starting with sandalwood, then whaling, different types of plantation agriculture, and tourism (La Croix, 2019). A relatively hands-off approach initially allowed tourism to expand rapidly, though declining resident sentiment, environmental impacts, and declining visitor spending now requires a more managed approach (Mak, 2018a; 2021). While tourism has proven more stable than commodities and Hawai‘i made the transition to tourism fairly well, Hawai‘i’s economy is still always very specialized (La Croix, 2021).

This intense specialization makes Hawai‘i’s economy vulnerable to external shocks, exposing its residents to economic volatility and risk. Initially after both 9/11 (Bonham et. al., 2006) and the pandemic (Bond-Smith and Fuleky, 2022), Hawai‘i’s tourism economy crashed as people avoided travelling in planes and travel restrictions were put in place to reduce transmission of COVID-19. Figure 1 examines the number of tourists and their spending since 1975. The number of tourists and their spending patterns is punctured by external shocks such as the Asian Financial Crisis, 9/11, the Great Recession, and the COVID-19 pandemic.

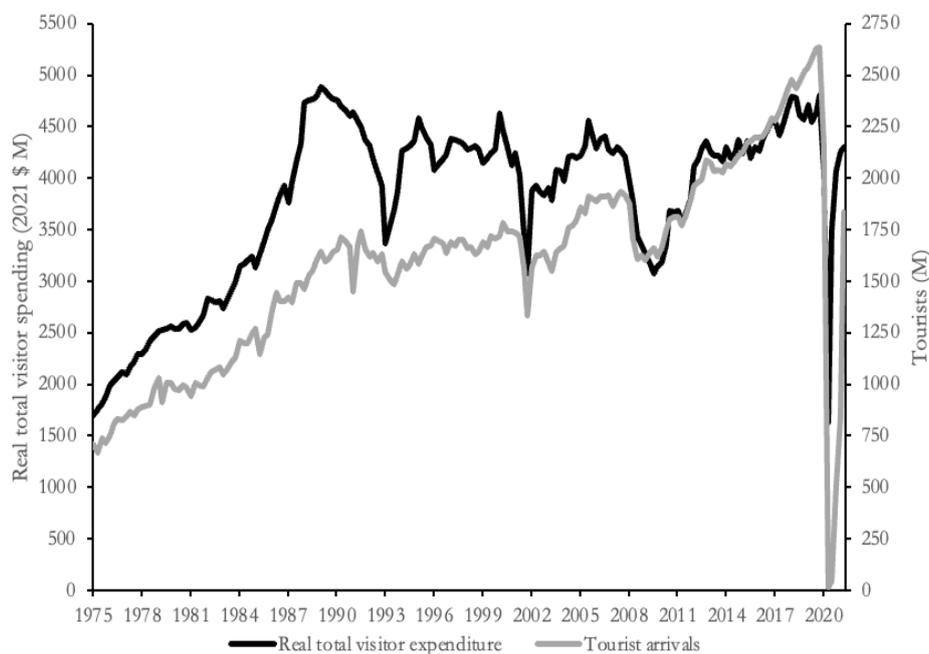


Figure 1: Tourist numbers and spending

Notes: Tourist spending is deflated based on the Honolulu CPI. Source: Authors calculations using data from DBEDT via UHERO.

² Kānaka Maoli is the Ōlelo Hawai‘i (Native Hawaiian language) term for Native Hawaiians.

³ Kama‘āina is a term from Ōlelo Hawai‘i meaning person of the land, to describe long-term current and former residents of Hawai‘i regardless of their racial background.

Many of these impacts are short to medium term. Vaccinations have lessened the epidemiological impact of COVID-19 and Americans craving a return to normalcy after a year without travel returned with record numbers in the summer of 2021. But international tourism is slow to recover with travel restrictions continuing in Japan and other sources of international tourists. As a result, the concentration in tourism also generated a slower economic recovery in Hawai'i than in the rest of the United States. These sharp shocks on the economy might also have lasting scars (Huckfeldt, 2022; Fuentes and Moder, 2020).

This extreme specialization also presents a long-term risk. Real tourism spending essentially stopped growing around 1990. It has long been understood that industries tend to eventually experience stagnating growth or even decline as technological progress slows down (Kuznets, 1929). On this basis, Kato and Mak (2013) point out that slowing technological improvement in air transport explained the end of growth in tourism in Hawai'i. While the slowdown in tourism has allowed Hawai'i to become slightly less specialized since 1990, no other sector has emerged to offer significant growth. As a result, Hawai'i's economic growth has failed to keep up with the rest of the United States (See Figure 2). Per capita GDP grew significantly after statehood until the end of the Cold War, followed by the so-called "lost decade" and limited growth after the Great Recession. Real GDP per capita peaked in 2005 at almost \$67,000 (in 2021 dollars) but only reached this peak again in 2019. In comparison, US real GDP per capita grew 17 % in that time. Based on these trends, Hawai'i faces a risk of becoming one of the so-called "left-behind places" (Hendrikson et. al., 2018) or "places that don't matter" (Rodríguez-Pose, 2018).

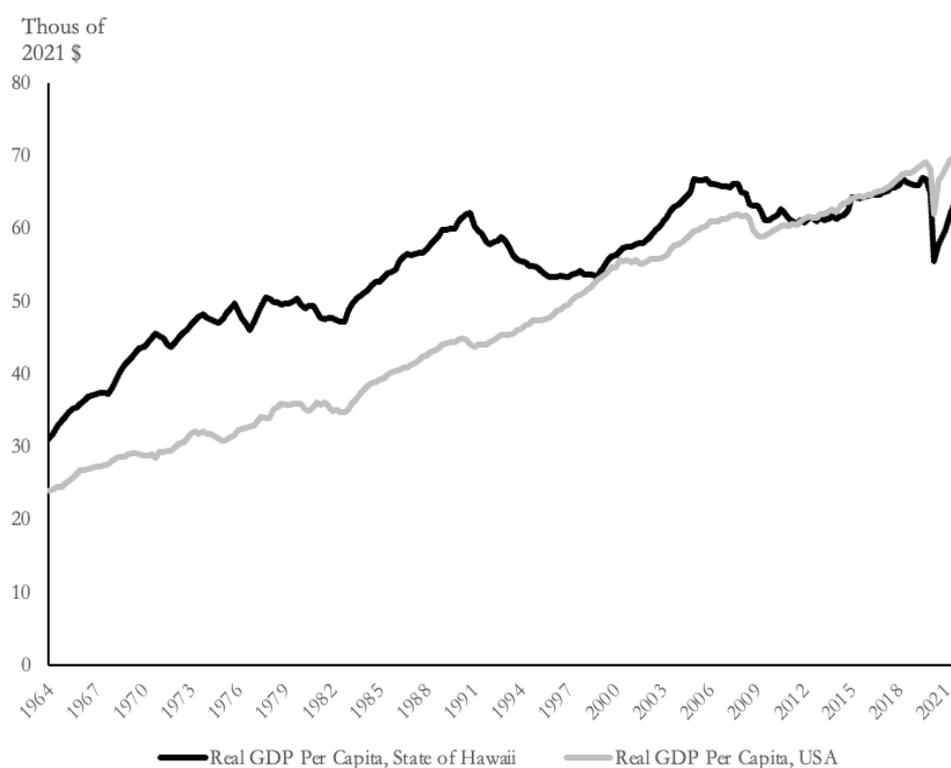


Figure 2: Real per capita GDP (in 2021 dollars) for Hawai'i and USA.

Notes: USA GDP is deflated using the GDP Price deflator. Hawai'i's GDP is deflated based on the Honolulu CPI. There is no state-level GDP deflator. Source: Author's calculations using data from UHERO

Domestic comparisons

If scale and isolation are indeed the cause of specialization in Hawai'i, then it should be expected that the industrial concentration of Hawai'i is similar to Alaska, Maine or Montana – isolated states with a small population. Given these states' major cities are less than half the size of the Honolulu metro area, better comparisons might be New Mexico or Nevada—states in less dense parts of the country with comparable (though relatively less isolated) major cities.

Shown in Figure 3, a Herfindahl index based on the number of employees on nonfarm payrolls in ten broad industry sectors is used to compare industry specialization by state. I measure specialization by employment because it describes how people experience specialization.⁴ An index value of 1 implies that all employment is in one industry only. In March 2020, prior to the impacts of the pandemic, Hawai'i was the third most concentrated state, surpassed only by Nevada and Alaska.

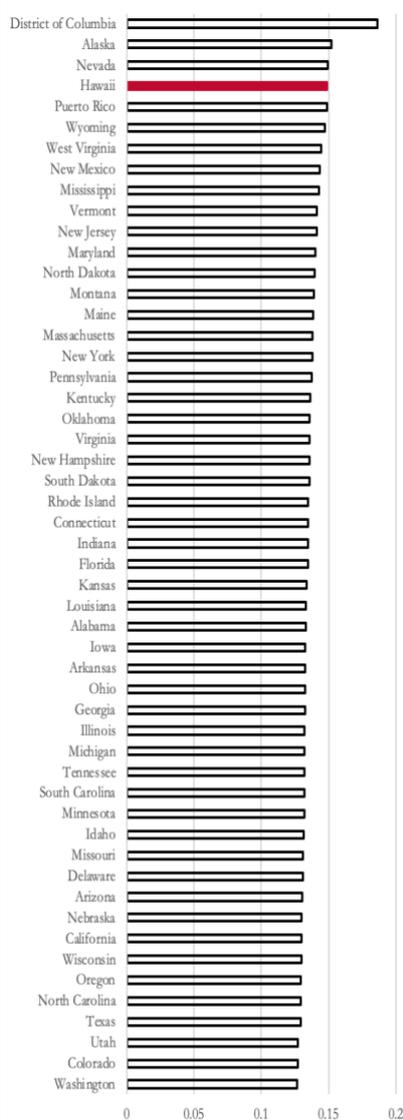


Figure 3: Herfindahl Index of non-farm employment in ten industry sectors by state plus DC and Puerto Rico, in March 2020

Notes: Ten industry sectors are Mining, logging and construction; Manufacturing; Trade transportation, and utilities; Information; Financial activities; Professional and business services; Education and health services; Leisure and hospitality; Other services; and Government including military. Source: Author analysis based on data from: U.S. Bureau of Labor Statistics, "State and Area Employment, Hours and Earnings": All states and ten industry super sectors, Retrieved on 16 March 2021.

⁴ An alternative such as GDP would describe the diversity of value, but would not describe how specialized its people are.

While this is just a snapshot, for the most part the concentration index in each state has been relatively stable over time. This implies that the contributing factors to industrial structure, are also not changing, such as location. The one exception to this is in states that have cities with significant population growth, such as Las Vegas, such that specialization has declined significantly in Nevada over the last twenty years as the scale of the internal Las Vegas economy developed over time and reduced its extreme industry concentration in tourism.

Adapting an analysis from the IMF on small countries (McIntyre et. al., 2018) to US states, I calculate the average concentration measured by an average annual Herfindahl concentration index for 2008-2020 based on twenty industries and compare it to the average annual growth rate in non-farm earnings over the same period. As with the study of small countries, states with greater industrial concentration typically had lower growth.

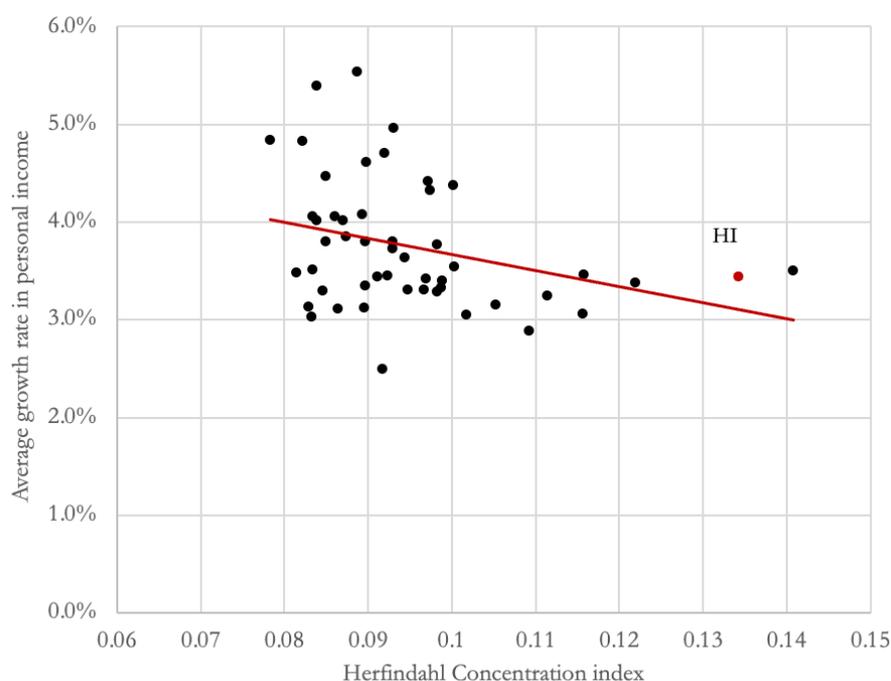


Figure 4: Average Herfindahl Index twenty industry sectors by state vs average annual growth rate in state personal income, 50 states

Notes: The twenty sectors include forestry, fishing, and related activities; mining, quarrying and oil and gas extraction; utilities; construction; manufacturing; wholesale trade; retail trade; transportation and warehousing; information; finance and insurance; real estate and rental and leasing; professional, scientific, and technical services; management of companies and enterprises; administrative and support and waste management and remediation services; educational services; health care and social assistance; arts, entertainment and recreation; accommodation and food services; other services (except government); and government and government enterprises. Source: Authors calculations using data from the Bureau of Labor Statistics.

International comparisons

These stories of specialization and volatility are not unusual for small, isolated, and open economies. Other global examples of isolated economies provide a concurring diagnosis.

Instead of ocean, Western Australia is separated from the main population centers in Australia by thousands of miles of desert. It too has a specialized ‘boom and bust’ economy that started with a gold-rush and now exports massive amounts of iron ore to China. WA’s economy is frequently rocked by external shocks due to volatile commodity prices (Bond-Smith et. al., 2019). Like Sandalwood or sugar, commodities are often subject to global competition, the trade or regulatory environment, exhaustion of a resource, or technology changes.

The so-called *tyranny of distance* is often used to describe how isolation has affected Australia's development.⁵ There is now optimism that the internet age will create new opportunities to overcome isolation. However, as I will explain, the tyranny of distance still applies in many ways, despite the internet, and is arguably stronger than ever *because* of the internet. Both internal and external increasing returns to scale imply that productivity depends on the scale of activity. This implies that larger firms are more productive than smaller firms, larger local industries are more productive relative to other places, and larger cities are more productive than smaller cities. There are a number of mechanisms that generate returns to scale with implications for the location of economic activity (Bond-Smith, 2021). Globalization and internet technologies allow industries to leverage local scale (firm, industry and city) to now supply to the world from large, well-connected cities. This especially applies to any knowledge-based activities, where a large and dense urban environment provides benefits such as labor market pooling or knowledge spillovers. As a result, much activity rationalizes into fewer, but better-connected locations.

New Zealand's economy is specialized in Agriculture and Food (Destremau and Siddharth, 2018). Like Hawai'i, it has a rich Polynesian heritage and natural resources predominantly based on its climate. Its Māori culture is viewed as a national treasure.⁶ It is highly integrated with, yet isolated from, a much larger nearby economy, Australia. And it has strong links to economies in Asia. New Zealand was once one of the most productive economies in the world first exporting Kauri for masts on tall ships and flax for making rope when it was the strongest fiber available at the time. In the middle of last century, it mostly exported wool and lamb to its colonial parent, the UK. New Zealand has also experienced waves of specialization followed by economic shocks as technology or trading relationships went out of New Zealand's favor (McCann, 2009).

In contrast, four small advanced economies are praised for achieving substantial growth (Yusuf, 2021). The UAE (especially Dubai), Ireland, Panama and Singapore, all emphasized the combination of foreign direct investment and high-skilled immigration to develop industrial manufacturing, services or both. The combination of the latest technologies with advanced skills to operate this capital allowed Ireland and Singapore to develop high-value industrial capabilities, and all four developed high-value tradable services such as financial, legal, transport and others. These were all similar to public investment solutions to the coordination problem. While Hawaii also hosts clusters in finance and insurance, and transport and logistics (Bonham and Coffman, 2017), geography also mattered. These four economies are all strategically located. Dubai has a central Middle-East location, allowing it to emerge as a hub for the entire supra-region. Ireland is a gateway to the European Union's massive single market. Singapore is strategically positioned along trade routes through South East Asia. And Panama, obviously, hosts the canal between the Pacific and Atlantic oceans. Hawai'i was once strategically located as a hub in the middle of the Pacific, but modern globalization has since bypassed Hawai'i.

Strategically located countries such as Singapore, Ireland, Panama and UAE are able to diversify by becoming central hubs that combine capital and skills, but this is more difficult in isolated places. Specialization in an industry based on its natural resources and increasing returns to scale enables small, isolated and open economies like Hawai'i, Western Australia and New Zealand to prosper despite their small size and isolation. Due to the attraction of its climate,

⁵ Originally the term comes from a history book 'The Tyranny of Distance: How Distance Shaped Australia's History' by Geoffrey Blainey published in 1966.

⁶ Māori history, culture and Te Reo (Māori language) also have many similarities with Kānaka Maoli history, culture and 'Ōlelo Hawai'i (Hawaiian language). In Māori oral history, Tangata Māori arrived in Aotearoa (Māori name for New Zealand) by waka (canoe) from the mythological place Hawaiki, a cognate word of Hawai'i (the 'okina denoting a glottal stop that replaces the "k"). The hero Māui features in both Māori and Kānaka Maoli cultural mythology. In Hawai'i Māui is credited with fishing up various islands and in Aotearoa he fished up the North Island while his waka (canoe) formed the South Island. In both cultures Māui is credited with restraining the sun. The word "mana" holds almost the exact same meaning in both Te Reo, and 'Ōlelo Hawai'i. Similarly with "tapu" in Te Reo and "kapu" in 'Ōlelo Hawai'i. The local people are referred to as "Kānaka 'Ōiwi" in 'Ōlelo Hawai'i, or "Tangata Whenua" in Te Reo: the "k" replaces the "t" and "l" replaces the "r" in a number of otherwise similar Polynesian words. Other words are identical but with very different meanings, such as "kai" meaning food in Te Reo and sea in 'Ōlelo Hawai'i. The close similarities reflect that the Polynesian migrations to Hawai'i and Aotearoa occurred around the same time.

natural beauty, and host culture, Hawai'i finds that scale by specializing in the tourism industry. Of course, these places should also try to increase value by expanding skills and capital, but their economies will likely remain very specialized, amplifying external shocks and increasing risk. To address this challenge, these economies need tailored economic policies that account for scale, isolation, connectivity, resources, economic geography and cultural riches.

4. Why doesn't innovation generate industrial diversity in Hawai'i?

Innovation is promoted in Hawai'i as the solution to diversify the economy, but innovation is also affected in similar ways by economic geography (Audretsch and Feldman, 1996; Feldman, 2016). Furthermore, poorly designed innovation policies or R&D tax credits have had little benefit (La Croix and Mak, 2021c; Kato et. al. 2009).

Figure 5 charts patents per 1,000 people employed in science and engineering occupations by state plus Puerto Rico and the District of Columbia. The science and engineering normalization accounts for differences in the size of states and their industrial structures. Even allowing for its small science and engineering sector, Hawai'i is ranked 49th (See Figure 5).

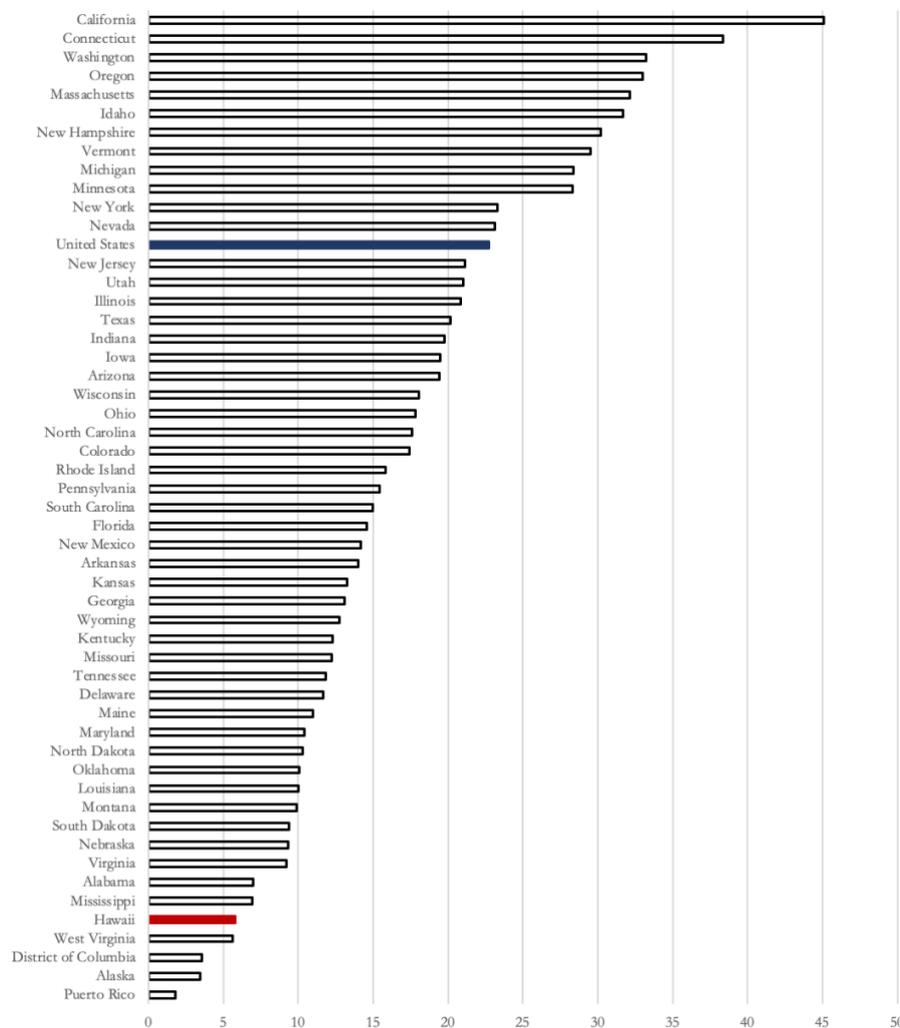


Figure 5: Patents per 1,000 Scientists and Engineers by state 2018*

Notes: *2017 patents per 1,000 S&E occupations are used for Alabama, Arizona, Indiana, Pennsylvania, and Utah due to missing data in 2018.

Source: Author analysis based on data from: National Science Board. "Patents Awarded per 1,000 Individuals in Science and Engineering Occupations." Science and Engineering Indicators: State Indicators. Alexandria, VA: National Science Foundation.

<https://nces.nsf.gov/indicators/states/indicator/patents-per-1000-se-occupation-holders>. Accessed on 7 December 2020.

While patents are not a perfect measure of innovation, the data imply that Hawai'i isn't very innovative. Furthermore, industry specialization and patent output are negatively correlated (See Figure 6). Local diversification enables knowledge spillovers across industries (Jacobs, 1969) which are especially important for young industries (Neffke, 2011) in 'nursery cities' (Duranton and Puga, 2001), making innovation even more challenging in highly-specialized places.

Like Hawai'i, the other states ranked poorly for patents are small and isolated without significant cities, and often dispersed populations: Alaska, Puerto Rico, Montana, South Dakota, Maine etc. Small scale and isolation make innovation less likely. As a result, fewer engineers, scientists, or entrepreneurs choose to live in these places and the engineers and scientists who do live there tend to be less innovative because there are fewer knowledge spillovers and less opportunity for serendipity. These rankings are also very stable over time. With one exception, Hawai'i has ranked between 47 and 49 out of 52 in every year since 2003.⁷

Innovation based growth diversifies economies because new ideas generate new and more productive industries (Hausman et. al., 2007; Hidalgo et. al., 2007). But innovation is even more clustered than businesses (Florida, 2005) in large part because much knowledge cannot be documented. Hausmann (2016) calls it "know-how". Know-how is very local. It is embedded in people, tasks, routines, and business. Innovation builds on existing know-how. Innovation combines know-how in new ways. Innovation clusters around people with know-how and people with know-how choose to go where other people with compatible know-how already are.

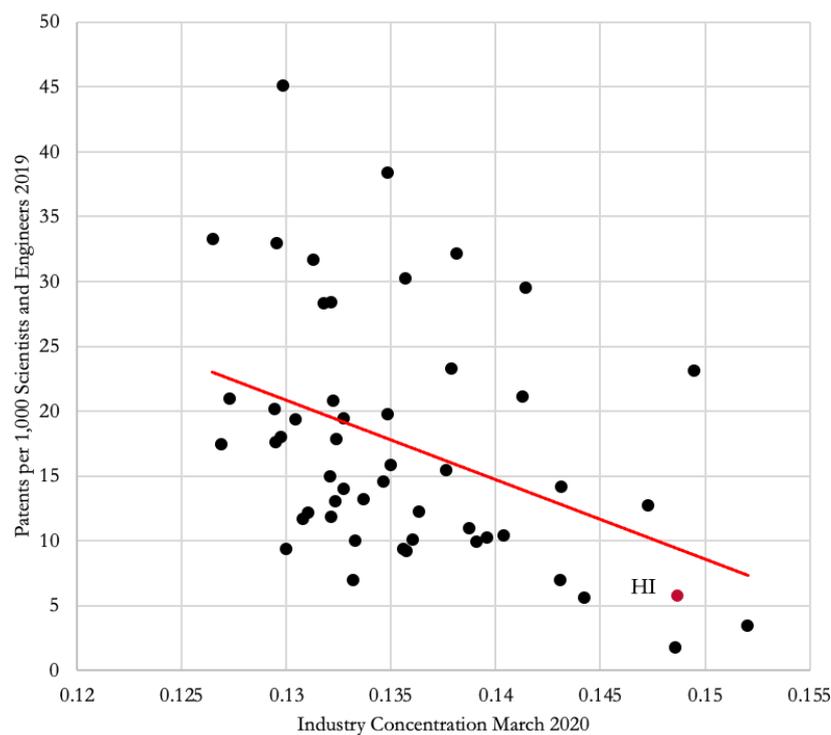


Figure 6: Patents per 1,000 Scientists and Engineers by state 2019 vs industry concentration

Notes: Ten industry sectors are Mining, logging and construction; Manufacturing; Trade transportation, and utilities; Information; Financial activities; Professional and business services; Education and health services; Leisure and hospitality; Other services; and Government. Source: Author calculations based on data from: U.S. Bureau of Labor Statistics, State and Area Employment, Hours and Earnings⁷. All states and ten industry super sectors, Retrieved on 16 March 2021. Author analysis of patents based on data from: National Science Board. "Patents Awarded per 1,000 Individuals in Science and Engineering Occupations." Science and Engineering Indicators: State Indicators. Alexandria, VA: National Science Foundation. <https://nces.nsf.gov/indicators/states/indicator/patents-per-1000-se-occupation-holders>. Accessed on 7 December 2020.

⁷ And probably earlier, but this was the earliest year in the dataset. The exception is 2007 when Hawai'i ranked 44.

The most innovative places are highly connected, with large numbers of skilled workers with useful know-how. Rarely does an entrepreneur have all the ideas. It's serendipity that yields chance meetings with someone who has the compatible know-how that generates new products and improvements. Serendipity is more likely if you're surrounded by other entrepreneurs, scientists and engineers with useful know-how. And just as an aspiring actor goes to Hollywood, aspiring entrepreneurs go to Palo Alto, New York and Boston because they are hoping to find people with the bit of "know-how" to make their idea work. Crescenzi et. al. (2019) describes this modern geography of innovation as a "hub-to-hub system" in which innovation clusters in only a handful of highly-connected places and generates regional divergence, rather than spreading innovation and productivity growth across regions. This has concentrated economic growth and innovation in only a handful of *superstar* cities (Gyourko et. al., 2013). Unfortunately for Hawai'i, Honolulu is not one of those superstar cities. With this understanding of innovation, it is no surprise that Hawai'i has low rates of innovation.

Entrepreneurs also move to superstar cities to access venture capital. Investors in risky start-ups want to trust that the ideas are promising and that the entrepreneurs have their fiscal interest in mind. So, investors are either located alongside entrepreneurs or they hire a manager they trust who is on the ground. Even when Hawai'i generates new tech start-ups, they often end up relocating to Silicon Valley to access venture capital and know-how.

This geography of innovation also explains the difficulty for Hawai'i to establish its own tech cluster. For innovation in isolated places, it is necessary for knowledge spillovers (and any transaction costs) to be sufficiently high (low) that a business prefers to be in the peripheral cluster than anywhere else (Bond-Smith and McCann, 2020). The tech industry intuitively appeals because it seems easier for these activities to locate in Hawai'i in spite of its isolation. But it's also easier for tech businesses in other places to now serve *more* customers including in Hawai'i. This implies greater advantages in those places that don't face the tyranny of distance.

5. What has been done to diversify Hawai'i? Why didn't it work?

The desire to diversify is not new, but it has become especially salient during the COVID-19 pandemic. Hawai'i's *Statewide Comprehensive Economic Development Strategy* (CEDS) for the 2016 to 2020 period already noted the importance of diversification (Economic Development Alliance of Hawai'i and State of Hawai'i Office of Planning, 2016). Unfortunately, it offers broad aspirations that could apply to almost everywhere in America. Similarly, O'ahu's draft CEDS for 2022-2026 promotes diversification (Oahu Economic Development Board, 2022), but is also too broad and poorly targeted (Bond-Smith, 2022b). The cluster approach is prescribed by the EDA but is powerless if it covers the entire economy. Otherwise, requirements such as healthy residents, housing and public safety are framed as clusters for diversification, when they are no such thing. These types of broad-brush aspirations do not address Hawai'i's *unique* challenges. But perhaps the issue is more fundamental, since organizations based around existing businesses are unlikely to draw up a strategy to benefit new industries.

Like many states, Hawai'i has implemented R&D tax credit policies in attempts to encourage a tech industry. While R&D tax credits are important, poorly designed policies can make tax credits ineffective. In the past, Hawai'i's 100% tax credit attracted businesses simply seeking the cashflow of a refundable credit, rather than making genuine investments in innovation. Furthermore, the original credit was directed towards strategic industries, though, as I will explain, aspirations for a tech industry might not be the best target for Hawai'i. Although the policy has been significantly improved, it is currently too small to contribute to economic growth and its first-come-first-serve rationing approach might even discourage tech firms from applying (La Croix and Mak, 2021c).

Many states seeking to diversify offer incentives to attract footloose industries. Intuitively, these industries are attractive because they can switch location easily and bring demand to both

up- and down-stream industries. For example in Hawai'i, the film industry is discussed as an economic activity to attract (La Croix and Mak, 2021b). Similarly, aspirations for a tech industry frequently hope to attract a major business to relocate. Some cities offer incentives to host events while others support large stadiums and attract a professional sport franchise. But any film makers, tech firms or top-tier sports franchises that might come to Hawai'i for an incentive are also easily attracted elsewhere. Ultimately, as with other tax competition policies, these are a race to the bottom where taxpayers foot the bill, and investors reap the rewards, rather than locals. While some incentives could be used to establish or expand an industry, or to reward businesses for positive externalities, Hawai'i should avoid playing a tax competition.

Policy-makers and others have long argued that Hawai'i's geographic position makes it a natural gateway between Asia and the United States. In some ways this is true, but it is also misleading. Hawai'i was once a gateway, providing a hub for crossing the Pacific when planes didn't have the range that they do today. For shipping Hawai'i has provided a strategic position for the US Navy since even before it became a US territory. But these characteristics have not recently worked in Hawai'i's favor. Modern shipping across the Pacific usually goes to Long Beach before trade is rerouted back to Hawai'i due to the Jones Act. Arguably, the Jones Act might even contribute to specialization in Hawai'i by acting as a tariff on ship transport, but not air. However, even if foreign ships were allowed to dock in Hawai'i enroute to the mainland, it is not clear that shipping patterns would change much (Olney, 2019). Economies of scale in shipping and external economies from the very large mainland market would provide productivity benefits for shipping that might even exceed the additional distance costs of routing trade to Hawai'i via Long Beach.

To some extent Hawai'i has diversified its sources of tourists. Business and convention travel makes use of the same hotels that recreational tourists require. Building the convention center could be thought of as resolving a coordination problem, or a public goods problem, in that the main benefits of a convention center accrue to the hotels hosting delegates, rather than the convention center itself. While financially the convention center itself has performed poorly (Mak, 2018b), this might be more of a governance and management issue that could potentially be resolved with more transparent accountability or privatization. In any case, addressing the initial coordination problem by state investment provided the opportunity for a more diversified tourism industry.

Hawai'i frequently ranks poorly for the ease of doing business. Of course, policy makers in Hawai'i should aim to ensure taxes are not too high, reduce unnecessary regulatory burdens, and make it easy to start a business, but Hawai'i has done little so far to improve things. In any case, improving the business environment isn't a panacea for the economy. Once good institutions are in place, and many are by being part of the USA, the places that perform well do so because production is a circular dynamic that reinforces existing advantages and disadvantages. New York and California are not necessarily great states for doing business from a "best practice" policy perspective, but they are places where people are more innovative because other innovative people live there and investors want to be near opportunities. Tech especially clusters in these places to benefit from knowledge spillovers when there is greater density of other tech businesses. These are places where initial advantages led to greater economic activity which led to additional advantages and *persistent* economic activity. Taxes are not the main determinants of *where* business takes place. For example, Amazon didn't choose to put its second headquarters in the state offering the greatest tax breaks. It chose Virginia and New York primarily for access to talented workers (Smale, 2018). Rather, the ease of doing business, and reducing the regulatory burden may all be desirable policies in their own right to support local economies, but are not a diversification policy because they do not address the local causes of specialization.

While tax competition attracts *footloose* activities (Andersson and Forslid, 2003; Blöchliger and Campos, 2011) that also easily shift away, taxes still matter (Moretti and Wilson, 2017). When assessing new revenue proposals, it is important to recognize that high tax increases would discourage affected workers and businesses. While California and New York have high income taxes and still sustain vibrant tech industries despite their high tax rates, these are places where local benefits of agglomeration and clustering exceed the cost of higher taxes (Brühlhart et. al. 2012). It is a privilege that tech businesses want to locate there for other reasons in spite of taxes, which Hawai'i unfortunately doesn't have.

Remote work is now touted as an opportunity that Hawai'i residents could take advantage of. Remote work would generate an export revenue by providing labor output to clients on the mainland. While remote work was already increasing before the pandemic (Clancy, 2020), it is not yet clear how remote work will go in the long term. COVID-19 restrictions showed that remote work certainly works *temporarily* for teams that have already established trust in person (Dingel and Neiman, 2020). But the increases in productivity that occurs as people build trust will take longer with remote teams, or may not happen at all. And, as with tax incentives for footloose industries, the people (and employers) willing to work remotely in Hawai'i, are also very mobile. As such, this could also imply substantial cost savings from off-shoring remote work entirely (Brinatti et al., 2021). Any jobs with even a few tasks that require face-to-face interaction are likely to be hybrid, in which workers still need to commute on a regular, though less frequent basis, which would be impractical to mainland cities from Hawai'i. There might be an increase in locals living on O'ahu's North Shore, in Kahului, or in Hilo and regularly commuting to Honolulu, though not every day, but remote work is unlikely to attract significant activity from the continent. For hybrid remote work, the greatest advantages accrue to the outer suburbs and exurbs of large, highly-connected metropolitan areas and significant commuter towns that are maybe a two- or three-hour drive away (Bond-Smith and McCann, 2022). As a result, the diversification opportunity of remote work is probably smaller for Hawai'i than for other states and cities. Or at least Hawai'i's remote work strategy must account for the nuance of Hawai'i's geography.

Overall, it seems that Hawai'i's efforts to diversify are mostly in vain. The spatial economic perspective finds that Hawai'i will naturally over-specialize in its comparative advantage due to external economies generating coordination or hold-up problems that limit the entry of other industries. Pushing back against comparative advantage is hard because the spatial economy reinforces that specialization as other industries shift away to places where they are more competitive due to internal and external increasing returns compounding advantages and disadvantages. Initiatives to support footloose industries are unable to attract industries that can be sustained in the long-run. There is a danger that the focus on footloose activity, such as remote work, will continue to persist in vain. And efforts to support R&D have been poorly designed, and poorly targeted. There are many other issues that remain unsolved, like the ease of doing business, the Jones Act, or housing regulation (Bonham et. al., 2022), but resolving these would also not address diversification. Yet the few successes point to how solutions could be crafted. These have typically been from opportunities within tourism itself, where the important factors of production are bound to Hawai'i, but may require governments to address specific market and government failures that limit these opportunities.

6. What are the opportunities to diversify?

The implication of these spatial economic arguments is that Hawai'i specialized in tourism in response to its small scale and isolation because it really had no other choices. As a result, its economic fortunes are largely dependent on external drivers for productivity in tourism and demand for vacations. Hawai'i is in a difficult position, in the middle of the Pacific Ocean where people take vacations, rather than part of the core US economy. Ultimately, this means O'ahu

will probably never be a “Silicon Island”. Hawai‘i is probably not going to be a significant gateway for business, travel or trade between Asia and the United States. And remote work combined with regular infrequent commuting will be impractical from Hawai‘i. But there are ways to promote diversification and growth that builds on the same principles that otherwise explain industrial specialization and Hawai‘i’s unique economic geography. Some characteristics of Hawai‘i are perfectly suited to particular activities. Hawai‘i’s proximity to Asia, its cultural and social networks to both the United States and Asia, key changes in technology, and importantly, recent changes in the global economy could be suitable for particular niches.

Below I sketch four potential initiatives to support Hawai‘i’s diversification strategy and long-term economic development. These initiatives identify areas of potential based on this spatial economic perspective where barriers can be addressed and support can be provided for the missing pieces to allow these opportunities to flourish. It’s also important that such initiatives are monitored with measurable targets and reviewed at regular intervals, refined and adjusted to ensure Hawai‘i is on track to meet its aspirations. Furthermore, effective governance structures are required to abandon failing initiatives, and avoid corruption or cronyism.

i. Strategic geography

My first recommendation is to focus on how Hawai‘i’s geographic characteristics and factor endowments are uniquely good for particular activities. Don’t try to be Silicon Valley, be Hawai‘i! Businesses that develop based on Hawai‘i’s economic geography with local elements as key factors of production are unable to emerge anywhere else. More importantly, they are unable to relocate anywhere else.

A resilient diversification policy, counterintuitively, develops *less* footloose activities. These are businesses that remain even if other places offer generous incentives because Hawai‘i has something special to offer that they prefer to remain, despite the benefits in other places. Development can still involve incentives to establish new activities, but they should be targeted at strategic areas that are chosen on the basis of Hawai‘i’s advantages to avoid subsidy or tax competition with other places. There will be many bold proposals that take strategic advantage of Hawai‘i’s location to carve out a particular niche. It requires outside-the-box thinking based on deep knowledge of industries, geography and Hawai‘i itself. The crucial question to ask is: In what activities is Hawai‘i’s geography better than anywhere else?

Some strategic geography features include connectivity to multiple trans-Pacific internet cables, Hawai‘i’s captivating scenery, feasible flight routes between Asia and South America, and the only truly tropical location in the USA for agriculture, aquaculture and fishing. Internet connectivity hasn’t been advantageous for Hawai‘i in the past because Hawai‘i’s location was not strategically better than California. But the expansion of Asia’s tiger economies in recent decades means that Hawai‘i is now strategically placed to benefit from international internet traffic. It’s not the full-blown tech industry that previous R&D tax credits failed to attract, it’s a niche that leverages Hawai‘i’s location to its advantage. Flights from Honolulu to as far as Buenos Aires or Sao Paulo would not push against the current length of the world’s longest flights.⁸ This means that Honolulu could potentially emerge as a hub between Asia and South America. Similarly, Hawai‘i makes a desirable meeting place for deals between business people in the growing economies of China and Brazil. Hawai‘i’s scenery is a magnet for film makers so policies that protect Hawai‘i’s natural treasures and govern their sustainable use provides support for a resilient content industry. A tourism industry based on the sustainable use of Hawai‘i’s natural amenities doesn’t require Hawai‘i to win hosting rights for big events. And the benefit of social capital in a sports industry built around the University of Hawai‘i community is locally bound.

⁸ The world’s longest flight is currently Singapore to Newark at over 9,500 miles. Honolulu to Rio de Janeiro would be 8,300 miles.

Geography is also influenced by policy. While much of Hawai‘i’s economic opportunities rely on the productivity benefits of the service-oriented agglomeration economies of Honolulu, there are also opportunities for the neighbor islands to benefit from their proximity and connectivity to O‘ahu and connectivity to the mainland. There is a risk that productivity growth on the neighbor islands continues to lag behind if they remain dependent on tourists. There is a role for the state to address the internal geography and connectivity between the islands. Ensuring affordable and reliable connectivity between the islands for residents, both physical and digital, will provide the neighbor islands with access to some of the services and infrastructures that benefit the urban economy in Honolulu.

ii. Remote work

While the greatest advantages of hybrid remote work are likely to accrue to the hinterlands of the largest globally connected cities (Bond-Smith and McCann, 2022), there are various niches of remote work that might be advantageous in Hawai‘i. Covid has highlighted how easy it is to *temporarily* work remotely in established teams and still be productive. Hawai‘i might be able to attract temporary remote workers, taking a sabbatical, or so-called “workation”. This is a diversification of tourists to Hawai‘i, but they will come for longer periods, pay taxes and hopefully do business. O‘ahu’s transient vacation rental system should target such long-stay working visitors, though new restrictions may limit this opportunity.

Again, these ideas are not completely new. For example, the “Movers and Shakas” program⁹ is a very small program designed to attract temporary remote workers when tourism disappeared entirely during the initial stages of the pandemic. The departments of Business, Economic Development and Tourism (DBEDT), and Labor and Industrial Relations (DLIR) have a remote work pilot project to demonstrate remote work in the state and inform potential employers and employees.¹⁰ Since many of these discussions are already taking place in Hawai‘i, the key recommendation is with respect to the *focus*, scope, governance and policy processes that shape the remote work strategy.

Rather than trying to attract *any* remote workers, Hawai‘i should ultimately try to attract remote workers that might leave their remote jobs and create new opportunities for residents in Hawai‘i. These are most likely to be workers in areas where Hawai‘i already has existing capabilities or returning kama‘āina. If either of these groups work remotely for a while in Hawai‘i, they’re also likely to serendipitously meet others already in Hawai‘i who they can collaborate or work with from similar or related industries. These are the people with knowledge they can share and transfer to locals. These are people who are more likely to stop working remotely and set up new businesses in Hawai‘i, creating job opportunities where locals can work, rather than returning to the continent. Those who do return, will have established networks in Hawai‘i that could generate new activity. Incentives to work remotely in Hawai‘i could be offered to these groups in return for participating in community-based events that would increase serendipity. Combined with support for R&D in relevant industries and business incubators, Hawai‘i could develop a cluster of start-up businesses in its *niche areas of expertise* starting with attracting potential entrepreneurs to work remotely.

iii. Support strengths

This targeted scope ties into my third recommendation – support Hawai‘i’s strengths. Diversification initiatives often fail because there are reasons the economy is so specialized, most notably due to comparative advantage. But diversification doesn’t mean Hawai‘i stops doing what it is already good at. Tourism will likely remain the dominant “export” industry. Unfortunately, the spatial economy perspective means that there is not really much choice. The

⁹ See www.moversandshakas.org.

¹⁰ See <https://invest.hawaii.gov/remote/>.

issue is really to find ways to upgrade the level of value-added, or extracted, from tourism to generate productivity growth locally.

Productivity growth has been lackluster because the mix of tourists has gradually changed from high-spending Japanese visitors in the 1980s to roaming American tourists experiencing Hawai'i's *free* amenities. Yet the discontent of locals and the pressure on environmental ecosystems implies that visiting Hawai'i's natural amenities is not really "free". Taxing tourists, charging access fees, and taxing owners of vacant holiday homes internalizes externalities, rations access in a sustainable manner, and extracts a greater value-added margin from Hawai'i's natural capital that would remain in Hawai'i, as well as incentivizing more efficient use of any overused attractions. This revenue could fund diversification initiatives, lower income taxes for residents, and support local services. If residents felt more of the benefits of tourism, they might feel more appreciative of their economic contribution.

Importantly, adding real value to tourism also means that Hawai'i's cultural and environmental amenities need to be genuine and respected. Native Hawaiians need the opportunity to shape tourism in a truly authentic way. The recent switch to the Council for Native Hawaiian Advancement for marketing Hawai'i is probably a good start. If Native Hawaiians have ownership of how their culture is promoted and receive its economic benefits, they can find ways to generate new opportunities that are consistent with their values and minimize negative impacts. Similarly, the environment is a critical and valuable resource of unique importance to Kānaka 'Ōiwi and Hawai'i's tourism industry, as well as critical for living on small islands in the middle of the ocean. Protecting and restoring Hawai'i's environmental ecosystems will generate higher value added by both increasing the value of economic outputs, and by reducing the negative externalities of overuse.

The support strengths initiative would also look for new tourism activities that command a premium. For example, New Zealand promoted adventure tourism such as bungee-jumping and sky-diving to increase the value-added of tourism. The Maldives and Bora Bora offer over-water accommodation. Hawai'i already offers boat trips to snorkeling, diving and fishing spots, but there are likely to be other activities and accommodation options that command higher value. Fine-dining and shopping also contribute. Visitors who come for short trips, typically spend more per day, so promoting such trips might add more value than visitors extending their stay. Business and conference travel has been poorly managed (Mak, 2018b), so better governance of the convention center would probably generate more value-added. And now that a more competitive conference travel industry has emerged in private hotels, perhaps the conference center could be privatized. The authentic "Made in Hawaii" brand offers opportunities to promote genuine Hawai'i souvenirs, but if these products are also exported to the mainland, it also offers the opportunity for visitors to reminisce in their Hawai'i experience long after they return home. Engaging in tourism experience research, to understand both the things that tourists value and how to provide these services, would yield further opportunities.

Supporting strengths also means finding ways to transfer existing capabilities to new activities. Rather than being specialized solely in tourism, Hawai'i specializes in a range of capabilities that are transferable between multiple industries. This means identifying Hawai'i's strengths, within the variety of tasks, skills or professions in the tourism sector, finding the range of industries that make use of these capabilities, and then making sure that these are adequately supported. Industry training, R&D and innovation in these areas will help to rebalance Hawai'i's economy and the dominance of tourism by finding new ways to make productive use of the things Hawai'i is best at. In this way, the dominance of tourism is limited by competition for factors of production rather than outright bans or moratoria on tourism development. This isn't picking winners; these are professions and capabilities that already picked Hawai'i. Industry policy isn't about sustaining declining industries too long either. Such support policies should

focus on activities, rather than particular businesses, so that the entrepreneurial discovery process can flourish and capabilities can transfer between industries as the economy evolves.

iv. Smart diversification

Finally, diversification initiatives need to be “smart” by focusing limited resources on the most promising opportunities. The most viable opportunities are those that make use of existing capabilities. These are industries that are closely related to Hawai‘i’s existing strengths. And because these industries make use of local capabilities, they are probably less footloose and more likely to remain in Hawai‘i in the long run. Investment in new but strategic capabilities would provide the missing pieces, that can be combined with existing strengths for new activities. Such initiatives will vary by the identified opportunities. Some opportunities will require new skills that could be addressed by initiatives to attract skilled residents, or to retrain existing residents in a new skillset. Other opportunities will require specific infrastructure. Some will involve coordination problems that require government to step in as an initial investor to build enabling infrastructures. And others will be related to technology and innovation, requiring investment in research funding in relevant domains.

This is the essence of the EU’s “smart specialization” policy (Foray 2011, McCann and Ortega-Argilés 2015). Smart specialization recognizes that regions cannot do everything, so need to focus on their core strengths and diversify into *related* areas that can use *existing* capabilities (Balland et. al. 2019). A report by UHERO in 2017 identifies a number of industry clusters in Hawai‘i (Bonham and Coffman, 2017). A strategy for Smart Specialization supports the capabilities that *bind* these clusters but may be useful for other industries not already present. In this way, a smart diversification strategy targets new industries that can leverage existing clusters and make use of similar capabilities.

This approach is also local. Smart diversification initiatives on Maui, might look very different than on the Big Island or in Honolulu, since the local capabilities are very different. Honolulu’s service sector offers quite different opportunities from small cities on the neighbor islands. The Big Island has greater ability to find scale in agriculture. Maui’s strengths are probably much more limited around tourism, but this expertise might offer options in hospitality education. Where there are common interests, the islands should work cooperatively. Areas such as aquaculture, tropical food and astronomy offer opportunities for collaboration.

Smart diversification is also not “picking winners” but supporting *areas* of opportunity, and letting the entrepreneurial discovery process determine the winning businesses (Foray, 2009). Selecting areas of opportunity requires a bottom-up process in which locals determine the vision for Hawai‘i supported by evidence to justify funding proposals. Such a vision will also incorporate Hawai‘i’s cultural values of Malama ‘aina, and Malama Kai.¹¹ It will understand the skills, tasks and capabilities of Hawai‘i’s existing residents. That vision requires the deep personal knowledge of locals, so it cannot be articulated by a single scholar in a research article. This community process is also vital to generate support for diversification initiatives (Liu, 2022).

Interestingly, the CEDS initiative has similar intentions to Smart Specialization, though it is lite on evidence and too broad brush in its proposals. Like Smart Specialization a CEDS is a prerequisite for regions to access funding (Economic Development Alliance of Hawai‘i and State of Hawai‘i Office of Planning, 2016). Updating CEDS strategies with concrete, evidence-based proposals targeting the specific barriers to development in areas of strength and opportunity would be relatively straightforward to implement. It will reform regulations and programs that are preventing industries such as agriculture from thriving. It will identify new activities and capabilities that are common to more of Hawai‘i’s potential opportunities and make proposals for funding to address the reasons why these opportunities have not emerged on their own.

¹¹ Malama is a term from Ōlelo Hawai‘i meaning to care for, ‘aina refers to the land, and kai refers to the sea.

R&D, training or critical infrastructure can then support those activities and capabilities such that the entrepreneurial discovery process determines the most productive ideas.

7. What now?

This perspective from spatial economics gives a counterintuitive answer. It is neither to continue specializing in Hawai'i's comparative advantage, nor to attract a wide range of footloose industries with generous incentives. It is the *less footloose* industries that are more likely to be viable in the long-term. These are industries that make use of Hawai'i's geography or are related to Hawai'i's existing strengths since they rely on locally-bound capabilities. These principles underpin the four proposed initiatives to identify diversification opportunities.

The next question is to figure out what is preventing these opportunities from emerging already. These are likely to be various coordination or hold-up problems, government failures, or other market failures that may be more prevalent in small markets in the presence of increasing returns. These are industries that become competitive once established at sufficient scale, but before it is established there isn't a business case for private investment in the necessary components. There may be a piece of infrastructure, various vertical linkages, missing skills or other public goods. A diversification policy would invest in the infrastructure, research and capabilities necessary for entrepreneurs to take advantage of these opportunities. In this way, market processes incentivize productivity growth. Incentives could be used in a limited fashion to accelerate scale. But initiatives must also be allowed to fail. A failing initiative isn't a failure of diversification policy unless a poorly performing initiative is allowed to persist. A transparent governance process would allow any failing initiatives to be abandoned or modified if they are not achieving their intended outcomes. Over many initiatives, a strong and transparent governance process should allow the successes to outweigh the failures.

Diversification is a gradual process. Even Hawai'i's transition to tourism took some time before it was the dominant industry. I do not expect any "next big thing" to provide an alternative to tourism. The tourism industry is likely to continue to dominate Hawai'i's economy well into the future. Prosperity does not come from hurting tourism, though sustaining tourism also requires sustainable use of Hawai'i's natural attractions and respect for its indigenous people. Rather than an alternative to tourism, diversification aims for:

- *resilience* to balance the dominance of the tourism industry by providing for alternative sources of prosperity when external shocks affect tourism numbers; and
- new pathways for *productivity growth* and economic expansion when record tourist numbers might be reaching the limits of physical capacity and community tolerance.

It will be a process of finding many new, relatively small opportunities in which Hawai'i can develop various niches with sufficient scale for productivity and a unique Hawai'i factor that enables resilience. Government, community, private, and stakeholder initiatives can all contribute to this process. Identifying new opportunities builds on *deep local knowledge* of Hawai'i's human capital, location, industry structure, culture and communities. Such a vision will understand the values, skills, tasks and capabilities of Hawai'i's residents. People and businesses that are *embedded* in Hawai'i's communities will last longer than volatile footloose industries. The diversification strategy will look for the little bit extra that is needed for ventures in *targeted domains* to get off the ground. All locals could get behind a *bottom-up* diversification process to create a vision for transforming Hawai'i's economy for a more resilient future.

References

- Altig, D., Baker, S., Barrero, J. M., Bloom, N., Bunn, P., Chen, S., Davis, S. Leather, J., Meyera, B., Mihaylova, E., Mizeng, P., Parkera, N., Renaulth, T., Smietanka, P., and Thwaites, G. (2020) “Economic uncertainty before and during the COVID-19 pandemic.”, *Journal of Public Economics*, 191, 104274.
- Andersson, F., and Forslid, R. (2003) “Tax Competition and Economic Geography,” *Journal of Public Economic Theory*, vol. 5(2), pages 279-303, April.
- Audretsch, D.B., and Feldman, M.P. (1996) “R&D spillovers and the geography of innovation and production”, *American Economic Review*, 86, pp 630–640.
- Balland, P.-A., Boschma, R., Crespo, J., and Rigby, D.L. (2019) “Smart specialization policy in the European Union: relatedness, knowledge complexity and regional diversification,” *Regional Studies*, 53:9, 1252-1268.
- Barron, K., Kung, E., and Proserpio, D. (2021) “The effect of home-sharing on house prices and rents: Evidence from Airbnb,” *Marketing Science*, Vol. 40, Iss. 1., 23-47.
- Blainey, G. (2001) “The tyranny of distance: How distance shaped Australia’s history,” 21st century edition, Sydney, *Macmillan*. Original, 1968.
- Blöchliger, H., and Campos, J.M.P. (2011) “Tax Competition Between Sub-Central Governments,” *OECD Working Papers on Fiscal Federalism* 13, OECD Publishing.
- Bond-Smith, S. (2021) “The unintended consequences of increasing returns to scale in geographical economics”, *Journal of Economic Geography*, Vol. 21, Iss. 5, pp 653–681.
- Bond-Smith, S. (2022a) “Discretely innovating: The effect of limited market contestability on innovation and growth”, *Scottish Journal of Political Economy*, vol. 69(3), pages 301-327.
- Bond-Smith, S. (2022b) “Is O’ahu’s new Comprehensive Economic Development Strategy strategic enough?”, *UHERO Blog*, July. See: <https://uhero.hawaii.edu/is-oahus-new-comprehensive-economic-development-strategy-strategic-enough/>
- Bond-Smith, S., and Fuleky, P., (2022) “The effects of the pandemic on the economy of Hawaii”, *UHERO Working Paper*, No. 4.
- Bond-Smith, S., and McCann, P. (2020) “A multi-sector model of relatedness, growth and industry clustering,” *Journal of Economic Geography*, Vol. 20, Iss. 5, pp.1145--1163.
- Bond-Smith, S., and McCann, P. (2022) “The work-from-home revolution and the performance of cities,” *Unpublished manuscript*.
- Bond-Smith, S., McCann, P., and Oxley, L. (2018) “A regional model of endogenous growth without scale assumptions,” *Spatial Economic Analysis*, vol. 13, no. 1, pp. 5-35.
- Bond-Smith, S., Dockery, A.M., Duncan, A., Kiely, D., and Salazar, S. (2019) “Future proofing the WA economy: A roadmap to industrial diversification and regional growth,” *Bankwest Curtin Economics Centre, Focus on Industry Series*, No. 4.
- Bonham, C., Edmonds, C. and Mak, J. (2006) “The Impact of 9/11 and Other Terrible Global Events on Tourism in the United States and Hawaii,” *Journal of Travel Research*. 45. 99-110.
- Bonham, C., and Coffman, M. (2017) A New Perspective on Hawaii’s Economy: understanding the role of clusters,” *University of Hawaii Economic Research Organization Report*, September.
- Bos, J.W.B., Economidou, C. & Zhang, L. (2020) “Specialization in the presence of trade and financial openness”, *Empirical Economics*, 58, 2783–2816.

- Brinatti, A., Cavallo, A., Cravino, J., and Drenik, A. (2021) “The International Price of Remote Work”, *NBER Working Papers* 29437, National Bureau of Economic Research.
- Brodeur, A, Gray, D, Islam, A, Bhuiyan, S. (2021) “A literature review of the economics of COVID-19”, *Journal of Economic Surveys*, 35: 1007– 1044.
- Brühlhart, M., Jametti, M., and Schmidheiny, K. (2012) “Do agglomeration economies reduce the sensitivity of firm location to tax differentials?” *Economic Journal*, vol. 122(563), pages 1069-1093.
- Catalini, C. (2017) “Microgeography and the direction of inventive activity”, *Management Science*, Vol. 64, No. 9, 3971-4470.
- Chetty, R. Friedman, J.N., Hendren, N., Stepner, M. and The Opportunity Insights Team (2020) “How Did COVID-19 and Stabilization Policies Affect Spending and Employment? A New Real-Time Economic Tracker Based on Private Sector Data,” *NBER Working Paper Series*, no. 27431, National Bureau of Economic Research.
- Clancy, M. (2020) “The case for remote work” *Economics Working Papers*: Department of Economics, Iowa State University.
- Crescenzi, R., Iammarino, S., Ioramashvili, C., Rodríguez-Pose, A., and Storper, M. (2019) “The geography of innovation: Local hotspots and global innovation networks”, *WIPO Economic Research Working Paper*, No. 57, World Intellectual Property Organization.
- Davila, D. (2019) “Hawaii’s growing Latino population”, *Honolulu Civil Beat*, 2 Jan, available at <https://www.civilbeat.org/2019/01/hawaiis-growing-latino-population/>
- Department of Business, Economic Development and Tourism (2020) “Hawaii broadband strategic plan”, State of Hawaii, October.
- Desmet, K. and Rossi-Hansberg, E. (2014). “Analyzing urban systems: have megacities become too large?”, *Policy Research Working Paper Series*, 6872, The World Bank.
- Destremau, K. and Siddharth, P. (2018) “How does the dairy sector share its growth? An analysis of the flow-on benefits of dairy’s revenue generation,” *NZIER final report to Dairy Companies Association of New Zealand*, New Zealand Institute of Economic Research, October.
- Dingel, J. I. and Neiman, B. (2020) “How many jobs can be done at home?” *Journal of Public Economics*, 189.
- Duranton, G., and Puga, D. (2001) “Nursery cities: urban diversity, process innovation, and the life cycle of products”, *American Economic Review*, 91, 1454–1477.
- Economic Development Alliance of Hawai‘i and State of Hawai‘i Office of Planning (2016) Hawai‘i Statewide Comprehensive Economic Development Strategy: 2016-2020 Strategic Plan, *Prepared for U.S. Economic Development Administration*, October 31.
- European Commission (2020) “What is Smart Specialisation?,” *S3 Platform*, available at <https://s3platform.jrc.ec.europa.eu/what-is-smart-specialisation->.
- Feldman M.P. (2016) “Geography of Innovation”, in: Augier M., Teece D. (eds.) *The Palgrave Encyclopedia of Strategic Management*, Palgrave Macmillan, London.
- Florida, R. (2002a) “The rise of the Creative Class”, Basic Books, New York NY.
- Florida, R. (2002b) “The economic geography of talent”, *Annals of the Association of American Geographers*, Vol. 92, No. 4, pp 743-755.
- Florida, R. (2002b) “Bohemia and economic geography”, *Journal of Economic Geography*, Vol. 2, No. 1, pp55-71.

- Florida, R. (2005) “The world is Spiky,” *The Atlantic Monthly*, October 48-51.
- Foray, D. (2011) “Smart specialisation: from academic idea to political instrument, the surprising destiny of a concept and the difficulties involved in its implementation” *Paper prepared for European integration process in the new regional and global settings*, Warsaw, October.
- Forero, A., Gallego, F.A., González, F., and Tapia, M. (2021) “Railroads, specialization, and population growth: evidence from the first globalization”, *Journal of Population Economics* 34, 1027–1072.
- Forman, C., and van Zeebroeck, N. (2019) “Digital technology adoption and knowledge flows within firms: Can the Internet overcome geographic and technological distance?,” *Research Policy*, Volume 48, Issue 8, 2019, 1-16.
- Forman, C., and van Zeebroeck, N. (2012) “From wires to partners: How the internet has fostered R&D collaborations within firms,” *Management Science*, Vol. 58, No. 8, 1549-1592.
- Fuentes, N. M. and Moder, I. (2020), “The scarring effects of past crises on the global economy”, *Economic Bulletin*, Issue 8, ECB.
- Fuleky, P. (2022) “Nowcasting the trajectory of the COVID-19 recovery”, *Applied Economics Letters*, 29:11, 1037-1041.
- Glückler, J. (2007) “Economic geography and the evolution of networks”, *Journal of Economic Geography*, Volume 7, Issue 5, September, Pages 619–634.
- Gyourko, J., Mayer, C., and Sinai, T. (2013) “Superstar cities”, *American Economic Journal: Economic Policy*, Vol. 5, No. 4, pp167-199.
- Handwerker, E. W., Meyer, P. B., Piacentini, J., Schultz, M., & Sveikauskas, L. (2020). “Employment recovery in the wake of the COVID-19 pandemic,” *Monthly Labor Review*, 1–24.
- Hausmann, R., Hwang, J., and Rodrik, D. (2007) “What you export matters”, *Journal of Economic Growth*, 12, pp 1-25.
- Hausmann, R., Rodrik, D. and Velasco, A. (2008) “Growth Diagnostics”, in Serra, N. and Stiglitz (eds.) *The Washington Consensus Reconsidered: Towards a New Global Governance*, Oxford University Press.
- Hausmann, R. (2016) “Economic development and the accumulation of know-how,” *Welsh Economic Papers*, 13-16.
- Hawai‘i Tourism Authority (2020) Hawai‘i Visitor Statistics Released for 2019, *HTA Release* (20-03), available at <https://www.hawaii-tourismauthority.org/news/news-releases/2020/hawai-i-visitor-statistics-released-for-2019/>.
- Hendrickson, C., Muro, M., and Galston, W.A. (2018) “Countering the geography of discontent: Strategies for left-behind places”, *Metropolitan Policy Program at Brookings*, The Brookings Institution.
- Hidalgo, C.A., Klinger, B., Barabasi, A.L. and Hausmann, R. (2007) “The product space conditions the development of nations”, *Science*, Vol. 317, No. 5837, July, pp 482-487.
- Huckfeldt, C. (2022) “Understanding the Scarring Effect of Recessions”, *American Economic Review*, 112 (4): 1273-1310.
- Kato, A., La Croix, S. and Mak, J. (2009). “Small State (Hawaii), Giant Tax Credits.” *Tax Notes*, November 30, 2009: 641-652.

- Kato, A., and Mak, J. (2013) “Technical Progress In Transport And The Tourism Area Life Cycle,” in: Clement A Tisdell (ed.), *Handbook of Tourism Economics Analysis, New Applications and Case Studies*, chapter 11, pages 225-255, World Scientific Publishing Co. Pte. Ltd..
- Ketels, C., and Duch, E. (2022) “Industrial policy in a new global reality: Towards a more location- and sector-driven approach”, *World Bank Blogs*, July 11. See: <https://blogs.worldbank.org/psd/industrial-policy-new-global-reality-towards-more-location-and-sector-driven-approach>
- Kline, P. (2010) “Place Based Policies, Heterogeneity, and Agglomeration” *American Economic Review*, 100 (2): 383-87.
- Krugman, P. (1991) “Increasing returns and economic geography”, *Journal of Political Economy*, Vol. 99, No. 3, June, pp 483-499.
- Kuznets, S., (1929) “Retardation of Industrial Growth,” *Journal of Economic and Business History*, I (1929), pp. 534–560.
- La Croix, S. (2016) “New perspectives on land and housing markets in Hawaii: Implications for industrial and commercial land leasing”, *UHERO Report*, January.
- La Croix, S. (2019) *Hawaii: Eight Hundred Years of Political and Economic Change*. Chicago: University of Chicago Press.
- La Croix, S. (2021) “Economic history of Hawai‘i,” *Oxford Encyclopedia for Business and Economic History*, August.
- La Croix, S., and Mak, J. (2021a) “Reviving Agriculture to Diversify Hawaii’s Economy,” *UHERO Research Brief*, 21 January.
- La Croix, S., and Mak, J. (2021b) “Understanding the Role of the Hawaii Film/TV/Digital Production Tax Credit in Diversifying the Hawaii Economy,” *UHERO Research Brief*, 15 March.
- La Croix, S., and Mak, J. (2021c) “The Hawaii research activity tax credit: Is it effective and how can it be improved?” *UHERO Research Brief*, 4 January.
- Liou, W. (2020) “Air Cargo in Hawai‘i’s Economy 2020 Update,” *Department of Business, Economic Development and Tourism, Research and Economic Analysis Division*, Government of Hawai‘i, December.
- Liu (2022) “The future of regional economic development and implications for the U.S. Economic Development Administration Programs, *Testimony submitted to the United States Senate Committee on Environment and Public Works*, November 1, The Brookings Institution Metropolitan Policy Program.
- Mak, J. (2017) “How many tourists is too many?”, *UHERO Blog*, January 26. See: <https://uhero.hawaii.edu/how-many-tourists-is-too-many/>.
- Mak, J. (2018a) “Rethinking Hawaii Tourism: Time to shift from marketing to managing tourism?” *Presentation at the Hawaii Economic Association*, May 3. See <https://uhero.hawaii.edu/rethinking-hawaii-tourism-time-to-shift-from-marketing-to-managing-tourism/>.
- Mak, J. (2018b) “Is the Hawaii Convention Center profitable?”, *UHERO Blog*, June 4.
- Mak, J. (2021) “Developing a dream destination: From laissez-laire to destination management”, *UHERO Research Brief*, July.

- Mak, J., and Tyndall, J. (2020) “Aloha ‘Oe: Population migration between Hawaii and the U.S. mainland,” *UHERO Blog*, August 6. See: <https://uhero.hawaii.edu/aloha-oe-population-migration-between-hawaii-and-the-u-s-mainland/>.
- Maskell, P., Eskelinen, H., Hannibalsson, I., Malmberg, A., & Vatne, E. (1998). “Competitiveness, Localised Learning and Regional Development: Specialization and Prosperity in Small Open Economies”, (1st ed.), *Routledge Frontiers of Political Economy*, 13, Routledge, London and New York.
- Matsuyama, K., (1991) “Increasing Returns, Industrialization, and Indeterminacy of Equilibrium,” *The Quarterly Journal of Economics*, vol. 106(2), pages 617-650.
- McCann, P. (2007) “Sketching out a model of face-to-face interaction and economic geography”, *Spatial Economic Analysis*, vol. 2, issue 2, 117-134.
- McCann, P. (2008) “Globalization and Economic Geography: The World is Curved, Not Flat”, 2008, *Cambridge Journal of Regions, Economy and Society*, 1.3, 351-370.
- McCann, P. (2009) “Economic geography, globalisation and New Zealand’s productivity paradox”, *New Zealand Economic Papers*, 43:3, 279-314.
- McCann, P., and Ortega-Argilés, R. (2015) “Smart Specialization, Regional Growth and Applications to European Union Cohesion Policy”, *Regional Studies*, 49:8, 1291-1302.
- McGahey, Richard M. (2008) “Regional Economic Development in Theory and Practice” in McGahey, R. M., and Vey, J. S., *Retooling for Growth*, Brookings Institution Press, pp 3-33.
- McIntyre A., Li, M.X., Wang, K. and Yun, H. (2018) “Economic benefits of export diversification in small states”, *IMF Working Paper*, WP/18/86.
- Morck, R. and Nakamura, M. (2007) “Business Groups and the Big Push: Meiji Japan's Mass Privatization and Subsequent Growth,” *Enterprise & Society*, vol. 8(3), pages 543-601.
- Moretti, E., and Wilson, D.J. (2017) “The Effect of State Taxes on the Geographical Location of Top Earners: Evidence from Star Scientists.” *American Economic Review*, 107 (7): 1858-1903.
- Murphy, K. M., Shleifer, A., & Vishny, R. W. (1989) “Industrialization and the Big Push”, *Journal of Political Economy*, 97(5), 1003–1026.
- Neffke, F. Henning, M., Boschma, R., Lundquist, K.-J., and Olander, L.-O. (2011) “The dynamics of agglomeration externalities along the life cycle of industries”, *Regional Studies*, Vol. 14, Iss. 1, pp 49-65.
- Oahu Economic Development Board (2022) “2022-2026 O‘ahu Comprehensive Economic Development Strategy (CEDS)”, 1st Draft for Public Review, OEDB, July.
- Olney, M. (2019) Jones Act, *UHERO Blog*, available at <https://uhero.hawaii.edu/jones-act/>.
- Porter, Michael E. (1998) “Clusters and the new economics of competition”, *Harvard Business Review*, November-December.
- Porter, Michael E. (2000) “Location, competition and economic development: Local clusters in a global economy”, *Economic Development Quarterly*, Vol. 14, No. 1, pp 15-34.
- Porter, Michael E. (2011) “Competitive advantage of nations: Creating and sustaining superior performance”, Simon and Schuster.
- Roberts, M. (2016) “Four years to improve renewable energy”, *UHERO Blog*, available at <https://uhero.hawaii.edu/four-years-to-improve-renewable-energy/>.
- Rosenstein-Rodan, P. N. (1943). “Problems of Industrialisation of Eastern and South-Eastern Europe”, *The Economic Journal*, 53(210/211), 202–211.

- Redding, S., and Venables, A. (2002) "The Economics of Isolation and Distance," *Nordic Journal of Political Economy*, vol. 28, pages 93-108.
- Redding, S. and Venables, A. (2004) "Economic geography and international inequality", *Journal of International Economics*, Vol 62, Iss. 1, pp 53-82.
- Rodrik, D. (1996) "Coordination failures and government policy: A model with applications to East Asia and Eastern Europe," *Journal of International Economics*, vol. 40(1-2), pages 1-22.
- Rodrik, D. (1998) "Why do More Open Economies Have Bigger Governments?" *Journal of Political Economy*, 106(5), 997–1032.
- Rodrik, D. (2004) "Industrial Policy for the Twenty-First Century," *CEPR Discussion Papers*, DP4767, Centre for Economic Policy Research, London.
- Rodrik, D. (2007) "Normalizing industrial policy", *Commission on Growth and Development*, Working Paper No. 3, International Bank for Reconstruction and Development and the World Bank.
- Rodrik, D. (2010) "Diagnostics before prescription", *Journal of Economic Perspectives*, Vol. 24, No. 3, pp 33-44.
- Rodrik, D. (2022) "What's next after export-oriented industrialization?" *World Bank Seminar*, March 30. See <https://www.worldbank.org/en/events/2022/02/17/Whats-Next-After-Export-Oriented-Industrialization>
- Rodríguez-Pose, A. (2018) The revenge of the places that don't matter (and what to do about it), *Cambridge Journal of Regions, Economy and Society*, Volume 11, Issue 1, March, Pages 189–209,
- Saunders, C., Dalziel, P., and McCallum, A. (2021) "Geography matters for small advanced economies: Implications for economic strategy", *Australasian Journal of Regional Studies*, Vol. 27, No. 2, 2021, 149-178.
- Skilling, D. (2020) "Frontier firms: An international small advanced economy perspective", *Report prepared for the New Zealand Productivity Commission*, Landfall Strategy Group.
- Smale, T. (2018) "5 Reasons Why New York and Arlington Were Amazon's Choice for HQ2," *Entrepreneur*, November, available at <https://www.entrepreneur.com/article/323478>.
- U.S. Bureau of Labor Statistics (2021) "State and Area Employment, Hours and Earnings: All states and selected industry supersectors," Retrieved on 16 March 2021.
- Usher, L.E. (2022) "Hosts and guests: Surfers' experiences of travel and tourism in the first wave of the COVID-19 pandemic", *Tourism in Marine Environments*, vol. 17, No. 1-2, pp. 103-111.
- Utz, Robert J. (2021) "Archipelagic Economies : Spatial Economic Development in the Pacific", World Bank, Washington, DC.
- World Economic Forum (2020) "The great reset", *World Economic Forum Conference*, September 24, see <https://www.weforum.org/great-reset>.
- Yusuf, S. (2021) "How four small successful economies improved upon the standard growth recipe", *CGD Note*, Center for Global Development, October.